



INSTITUTE FOR DEFENSE ANALYSES

**TRANSCOM-DLA
Roles and Responsibilities**

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Executive Summary

The Senate Committee on Armed Services, in its report (114-255) on the National Defense Authorization Act for Fiscal Year 2017, stated:

[While noting that] DLA and TRANSCOM have different missions in support of the warfighter [the Committee asks whether] there may be efficiencies that could be created reorganizing or consolidating the two agencies. Additionally, the committee is concerned that some of the functions that currently reside with either organization may be better suited for the service-level functions.¹

In response, the Department of Defense (DOD) tasked the Institute for Defense Analyses (IDA) with conducting an independent assessment of the Defense Logistics Agency (DLA) and the United States Transportation Command (TRANSCOM). IDA's research, presented in this paper, concludes that:

1. The DLA-TRANSCOM structure is working.

- There would not be any efficiencies gained from reorganizing or consolidating the two organizations.
- There are no functions that should—based on operational effectiveness or efficiency—be returned to the military Services.
- Additional economies of scale may exist in Service storage and distribution functions. A detailed business case analysis is required to determine if merging these functions into DLA could, in fact, reduce Service costs.
- A comparison of the Defense Working Capital Fund (DWCF, a “pure” working capital fund) and the Transportation Working Capital Fund (TWCF, a “hybrid”) reflects the significant differences between TRANSCOM's business and DLA's business. TWCF pricing transparency should be improved.

2. A key challenge facing DOD's “end-to-end” distribution system is achieving a seamless integration of the distribution functions of TRANSCOM, DLA, the military Services, and the Geographic Combatant Commands (GCCs).

¹ Senate Committee on Armed Services, Report 114-255, National Defense Authorization Act for Fiscal Year 2017, 99.

- The Commander of TRANSCOM must continue to lead improvements in DOD distribution capabilities through enhanced collaboration among all DOD actors, including the Services and the GCCs.
- Effectively harvesting data across the “end-to-end” distribution system (particularly the bridge between TRANSCOM and DLA on the one hand, and the Services and GCCs on the other) is crucial to improving DOD distribution.

A. Findings

The current roles and responsibilities of TRANSCOM and DLA reflect the substantial DOD-wide consolidations of recent decades. The resulting organizations have helped to improve the effectiveness and efficiency of DOD’s logistics and distribution enterprise.

Since its creation in 1961, DLA has experienced successive waves of item management and supply chain consolidation, leading to considerable benefits from economies of scale. Similarly, the creation of TRANSCOM in 1987—to manage the Defense Transportation System (DTS) and to command the military departments’ transportation components—significantly improved DOD’s ability to plan and execute worldwide force deployments. Given the current performance, distinct purposes, and unique structures of the two organizations, the IDA research team found no compelling indications that a TRANSCOM-DLA reorganization or consolidation would lead to operational advantages or improved economies of scale.

There is substantial evidence that TRANSCOM and DLA work well together, especially in areas where their respective “businesses” are directly connected. DLA, for example, is one of many customers of the TRANSCOM-managed DTS. Further, in their respective roles as supply chain participants—DLA as a supplier/distributor and TRANSCOM as a transportation enabler—the two organizations have created an In-Transit Visibility (ITV) system that provides them and their customers with near-perfect ITV. They also appear to collaborate well on stock positioning and other actions to adapt the joint deployment and distribution enterprise to meet evolving operational needs.

DLA and TRANSCOM together, however, represent only a portion of DOD’s deployment and distribution enterprise; the other legs of the stool are the military Services and GCCs. This gives rise to a critical challenge facing DOD: ensuring end-to-end supply chain and distribution readiness. During peacetime, most supply chain and distribution operations proceed relatively smoothly. But, during a contingency-related surge of forces and supplies, unique and overwhelming distribution challenges arise to stress even the most sophisticated global transportation and distribution infrastructure. Therefore, most commanders will encounter an immature theater logistics system during the initial phases of an operation. It follows that a crucial aspect of combatant commanders’ peacetime (so-called “Phase 0”) planning is to prepare their theaters for rapid surges in deployment and distribution.

As the conflicts in Iraq and Afghanistan demonstrated, with time, logisticians and operators can build and sustain an effective logistics system. However, planners must be realistic about the capabilities that will be available in the first days and weeks of a conflict, when the short-term surge—versus longer-term sustainment—is at its peak, and when operational effectiveness is most vulnerable to supply chain interruptions. Thus, “end-to-end” readiness planning must take into account all logistics requirements, working backward from the potential battlefield to the sources of supply, and fully considering the distribution system that connects the nodes in between.

Both TRANSCOM and DLA currently partner with the military Services and the Geographic Combatant Commands to prepare for major contingencies, including surges. However, budget pressures over many years have led all of these organizations to downsize the resources and capabilities needed to perform deployment and distribution operations. These localized decisions have compounded across the end-to-end distribution system, heightening the systemic risk to DOD’s ability to scale its supply chain operations rapidly—and, consequently, raising the risk to wartime effectiveness.

This risk appears to be growing, as planners now expect that future logistics operations will encounter a more contested operational environment than in past conflicts. This includes the challenges posed by new and emerging cybersecurity threats. Because of DLA and TRANSCOM’s heavy reliance on commercial supply chain partners, the vulnerability of open and integrated information systems is a source of special concern to these two organizations. While they are collaborating in this area, much remains to be done to reduce cyber-related risk to joint deployment and distribution operations.

Another challenge for TRANSCOM and DLA—and the Services—is that optimizing end-to-end distribution requires integrated information from diverse systems, both government-owned and commercial. While TRANSCOM and DLA are successfully sharing and integrating information with one another, efforts to harmonize information system architectures and the sharing of information across the larger DOD have proven difficult. Better enterprise-wide collaboration and use of data is needed. The senior leadership of TRANSCOM, DLA, and the Joint Staff, together with senior logisticians in the military Services, have initiated a dialog on the potential impact of recent advances in information technology, including machine learning and “big data.” Based in part on their observations of advances in the private sector, these officials believe that a greatly expanded strategy of “information harvesting” will pay dividends in both operational performance and efficiency.

TRANSCOM and DLA are organized quite differently, reflecting their distinct businesses and the support they provide to the armed forces. This has important implications for their financial management practices and for the operation of their respective working capital funds. As a defense agency, DLA is a unitary organization; its director has direct management control of all the entities reporting to him. In addition, DLA’s business model is relatively straightforward: it adds a markup to the price of every item it supplies in order to cover its internal operating costs. These markups,

included in DLA's cost recovery rates, enable the DWCF to remain revenue-neutral over time. Thus, the DWCF is very close to being a "pure" working capital fund.

As a combatant command, TRANSCOM consists of component commands from three military Services—the Air Mobility Command (AMC, Air Force), the Military Sealift Command (MSC, Navy), and the Military Surface Deployment and Distribution Command (SDDC, Army). However, the respective Services, not the commander of TRANSCOM, "own" these organizations and control the resources allocated to them. In particular, the Air Force incurs significant costs for acquisition, operation, and training associated with mobility aircraft, aircrews, and support operations. Consequently, the TWCF is a "hybrid" working capital fund; its operating costs are partially recovered from customers of its transportation services, and partially financed by transfer payments from the military departments.

For example, TRANSCOM typically charges its airlift customers the equivalent of commercial rates, even when it employs organic (military) aircraft. Because these aircraft are more expensive to own and operate than commercial planes, the differential cost is covered by the Air Force's operations and maintenance budget. A similar calculus applies to organic sealift vessels. For this reason, rate setting for TRANSCOM is a more complex process than it is for DLA. Due in part to this hybrid nature of the TWCF, TRANSCOM's rates are not as transparent to the customers as they are for some other working capital funds. In addition, the TWCF structure limits TRANSCOM's flexibility to make system-wide improvements, whereas a pure working capital fund can finance such activities more easily.

B. Recommendations

Recommendation 1: *Do not consolidate part or all of TRANSCOM and DLA*

There are no known, unharvested economies of scale between the two organizations. TRANSCOM and DLA already collaborate well with one another.

Recommendation 2: *Continue Exploiting DOD-Wide Economies of Scale*

The Secretary of Defense, through OSD, should ensure that DLA continues to improve its supply chain operations at the retail level. As these improvements are realized, DOD should consider further consolidation of military Service storage and distribution functions into DLA.

Recommendation 3: *Improve End-to-End Distribution Readiness*

The commander of TRANSCOM should lead a DOD-wide risk assessment of distribution scalability to support current planning scenarios. This would entail assessing the ability of the Joint Deployment and Distribution Environment (JDDE) to surge its end-to-end capacity to achieve distribution objectives rapidly, particularly in contested environments and immature theaters.

This assessment should consider the adequacy of staffing levels in organizations with distribution and transportation responsibilities, including the Geographic Combatant Commands, the military Services, TRANSCOM, and DLA.

The commander of TRANSCOM, as the Distribution Process Owner, should continue to lead improvements in DOD distribution capabilities through enhanced collaboration among all of the actors in the JDDE.

Recommendation 4: Formalize an Information Harvesting Strategy

The commander of TRANSCOM should champion a clearer end-to-end understanding of logistics and distribution assets, demands, and costs. The commander should lead the development of a logistics information harvesting strategy that includes the Joint Staff, OSD, the Services, and the GCCs.

The commander of TRANSCOM and the director of DLA should determine how to use the capabilities of DLA (including its J-6, Information Operations organization) as part of this information harvesting strategy.

Recommendation 5: Improve TWCF Transparency and Flexibility

The commander of TRANSCOM should improve communications with customers on how TWCF rates and costs are calculated, and ensure that the TWCF can be used to address enterprise-wide needs. Valuable lessons may be learned from DLA's experience.

C. Congressional Topics

In its request for this study, the U.S. Congress directed that specific topics be addressed. The results are summarized here:

1. DLA's use of TRANSCOM's Defense Transportation Coordination Initiative (DTCI).
 - DLA and TRANSCOM collaborate effectively on the use of DTCI (now the Defense Freight Transportation Services (DFTS)).
2. DLA's efforts to improve supply alignment and TRANSCOM's role in DLA's efforts.
 - DLA and TRANSCOM collaborate effectively.
 - The key challenge is alignment with the Services and GCCs.
3. DLA's and TRANSCOM's efforts to identify and implement transportation and distribution efficiencies.
 - DLA and TRANSCOM collaborate effectively.
 - There is no evidence of untapped efficiencies that would produce economies of scale in DLA and TRANSCOM distribution operations.

- TRANSCOM management of the TWCF should be more transparent. TRANSCOM may benefit from DLA lessons-learned in this regard.
4. The role of the individual Services in the identified functions of DLA and TRANSCOM, and whether there would be any efficiencies gained by moving any functions from DLA and TRANSCOM to the Services.
 - Moving functions back to the Services would likely reverse the benefits gained (over several decades) from the economies of scale in DLA and TRANSCOM.
 - Improved collaboration is needed between the Services and the commander of TRANSCOM (as the Distribution Process Owner) on end-to-end distribution readiness and information harvesting.
 - Further economies of scale may be possible by moving selected storage and distribution from the Services to DLA.
 5. Identification of senior flag officer positions no longer required at DLA and TRANSCOM due to consolidation and delegation of functions.
 - Consolidation is not a recommended course of action.
 6. Recommendations regarding the future need for TRANSCOM to remain a combatant command due to the consolidation and delegation of functions.
 - Consolidation is not a recommended course of action.
 7. Any other recommendations on ways that a reorganization or consolidation of these entities could improve efficiencies, including the shifting of any functions out of either organization back to the military Services.
 - Consolidation would not achieve meaningful economies of scale.
 - Effort should be focused on improving end-to-end distribution readiness.
 - A concerted effort needs to be made to formalize an information-harvesting strategy.
 - TRANSCOM should pursue its efforts to improve TWCF transparency, including taking advantage of DLA lessons-learned.

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1. Introduction

A. The Origins and Purpose of this Independent Review

The United States Transportation Command (USTRANSCOM; hereinafter TRANSCOM) and the Defense Logistics Agency (DLA) are central actors in the logistics enterprise of the U.S. armed forces. Together with the maintenance activities of the military Services and the operational logistics that are organic to military units, TRANSCOM and DLA provide the wartime and peacetime logistics that allow for military force projection, employment, and sustainment.

TRANSCOM is a unified combatant command responsible for planning for and providing air, land, and sea transportation in support of U.S. forces engaged in peacetime activities and contingency operations worldwide. DLA is a defense agency responsible for sourcing and providing consumable items to the U.S. military, “from food, fuel and energy to uniforms, medical supplies, and construction material.” This includes “86 percent of the military’s spare parts and nearly 100 percent of fuel and troop support consumables.”²

TRANSCOM and DLA share two common purposes with the military Services and the Geographic Combatant Commands: to ensure combat readiness and to sustain U.S. forces. Both organizations have a primary responsibility to prepare for and to support the deployment and employment of U.S. forces in the event of conflict, up to and including a major contingency. In addition, both organizations continually provide services that help to sustain deployed and non-deployed U.S. forces around the world.

More precisely, both TRANSCOM and DLA must be able to:

- Surge to support deployment of U.S. forces during the early days and weeks of a major contingency.
- Sustain U.S. forces deployed to a contingency.
- Sustain U.S. forces engaged in peacetime operations, including training and exercises.

As part of their responsibilities for maintaining operational readiness, both organizations must be able to engage in operational planning with the Geographic Combatant Commands and the military Services. This includes logistics, transportation, and distribution plans related to pre-conflict preventative measures and posturing, known as “Phase Zero” planning.³

² “DLA at a Glance,” <http://www.dla.mil/AtaGlance.aspx> (accessed June 16, 2017).

³ See Wald (2006) for a detailed explanation of Phase Zero.

B. Congressional Concerns

While recognizing that TRANSCOM and DLA must work closely together, Congress has expressed concern about whether the two organizations' combined support to operational customers is delivered as effectively and efficiently as possible.

The [Senate Committee on Armed Services] believes that while DLA and TRANSCOM have different missions in support of the warfighter, there may be efficiencies that could be created reorganizing or consolidating the two agencies. Additionally, the committee is concerned that some of the functions that currently reside with either organization may be better suited for service-level functions.

Consequently, the committee directed the Department of Defense (DOD) to undertake an "Assessment on duplication and inefficiencies within the Defense Logistics Agency and United States Transportation Command."⁴

In response to the congressional direction, the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness (L&MR), in the Office of the Secretary of Defense (OSD), requested that the Institute for Defense Analyses (IDA) conduct this independent study. IDA was directed to address the following seven topics contained in the congressional direction:

1. DLA's use of TRANSCOM's Defense Transportation Coordination Initiative (DTCI).
2. DLA's efforts to improve supply alignment and TRANSCOM's role in DLA's efforts.
3. DLA's and TRANSCOM's efforts to identify and implement transportation and distribution efficiencies.
4. The role of the individual services in the identified functions of DLA and TRANSCOM, and whether there would be any efficiencies gained by moving any functions from DLA and TRANSCOM to the services.
5. Identification of senior flag officer positions no longer required at DLA and TRANSCOM due to consolidation and delegation of functions.
6. Recommendations regarding the future need for TRANSCOM to remain a combatant command due to the consolidation and delegation of functions.
7. Any other recommendations on ways that a reorganization or consolidation of these entities could improve efficiencies, including the shifting of any functions out of either organization back to the military Services.

C. Research Topics and Report Organization

In order to address the congressional concerns, the IDA study focuses on four principle research topics. First, the study details the **business processes** operated by TRANSCOM and DLA, to evaluate whether unnecessary duplication of effort or unrealized economies of scale might

⁴ 2017 Senate NDAA Report, to accompany S. 2943; 99-100.

exist in the two organizations' current business processes. The study considers the authorities, responsibilities, and functions assigned to TRANSCOM and DLA. If significant overlap or redundancies are found in these areas, then a reorganization or consolidation involving the two organizations might be expected to lead to cost savings or more effective support to the warfighter. The study considers the similarities and differences between their businesses and those found in the private sector. The study also examines the working capital funds employed by TRANSCOM and DLA—the Transportation Working Capital Fund (TWCF) and the Defense Working Capital Fund (DWCF)—to better understand similarities and differences among the organizations' financial management processes. These processes would be a major consideration in any reshaping of functions among DLA, TRANSCOM, and the Services.

Chapters 2 (on TRANSCOM), 3 (on DLA), and 4 (on TRANSCOM, DLA, the Services, and the Geographic Combatant Commands (GCCs)) clarify the roles and responsibilities of each organization, establishing a baseline against which to evaluate their performance, both individually and holistically.

Second, the study considers the **readiness** roles of TRANSCOM, DLA, the GCCs, and the military Services, insofar as these postures inform optimal business practices by TRANSCOM and DLA, as well as the division of functions among them. The research examines DOD's logistics readiness needs—for a major surge, for wartime sustainment, and for peacetime sustainment—and investigates how DOD's joint logistics enterprise addresses those needs. Gaining an understanding of how each organization complies with its readiness responsibilities sheds additional light on their business practices and the working relationships between them and their customers. We further investigate how well DLA and TRANSCOM support GCC and Service planning efforts, which is another vital aspect of the DOD logistics enterprise. This topic is covered primarily in chapter 4.

Third, the study considers the **collaboration** between TRANSCOM and DLA in specific aspects of DOD's distribution processes, as identified for review by the Congress. These include the Defense Transportation Coordination Initiative (DTCI),⁵ supply alignment, and transportation and distribution efficiency. In each of these areas, we examine how well TRANSCOM and DLA collaborate with each other, whether and how this collaboration has improved the performance of DOD's logistics enterprise, and whether better coordination could further enhance enterprise-wide performance. This is covered primarily in chapter 5.

Fourth, the study considers the current organizational roles and responsibilities for DOD's **end-to-end distribution** process,⁶ including DLA, TRANSCOM, the GCCs, and the Services.

⁵ The Defense Transportation Coordination Initiative (DTCI) is a legacy contract. Pending contract protests, it is to be replaced in 2017 by the substantially revised Defense Freight Transportation System (DFTS).

⁶ This report employs the joint doctrinal definition of distribution found in Joint Publication 4-09, *Distribution Operations*, 19 December 2013, ix: "Distribution includes the ability to plan and execute the movement of forces for deployment and redeployment as well as sustainment and retrograde. It is the operational process of synchronizing all elements of the logistic system to deliver the right things to the right place at the right time to support the joint force commander. The Secretary of Defense directed joint deployment and distribution enterprise

The research team sought to determine whether these roles are well defined and whether, in operation, they enable the enterprise to function holistically. Specific areas of interest include distribution planning, asset visibility, information sharing, and governance. This is covered primarily in chapter 4.

Table 1 contains a list of questions for elaborating and exploring each of the four research topics described above. Table 1 and Table 2 highlight the relevant congressionally directed questions addressed by each research question.

(JDDE) community of interest (COI) connects Service, Department of Defense (DOD), and other government agency movements under the end-to-end distribution coordinating authority exercised by Commander, United States Transportation Command (CDRUSTRANSCOM) as the distribution process owner (DPO).”

Table 1. Research Questions for Exploring Congressional Topics

<u>Research Question</u>	<u>Congressional Topic</u>
<p>1. How similar or different are the “businesses” that TRANSCOM and DLA operate?</p> <p>What are these businesses?</p> <p>How closely do they follow relevant private sector business practices?</p> <p>Is there unnecessary duplication of effort between TRANSCOM and DLA?</p> <p>What are the similarities and differences between their working capital funds?</p> <p>Are there unrealized economies of scale?</p>	<p>1. DLA use of DTCl</p> <p>5. Senior Flag Positions</p> <p>6. TRANSCOM as a COCOM</p> <p>7. Other Recommendations</p>
<p>2. What does “Readiness” mean to TRANSCOM and to DLA?</p> <p>How do they prepare for surge and sustainment requirements in major contingencies?</p> <p>How do these responsibilities differ from peacetime and minor contingency operations?</p> <p>Are TRANSCOM and DLA contributing fully and to GCC and Service planning processes?</p>	<p>4. Service Roles</p> <p>7. Other Recommendations</p>
<p>3. How well do TRANSCOM and DLA collaborate with one another?</p> <p>Where has collaboration resulted in improved performance for the DOD enterprise?</p> <p>How is collaboration facilitated?</p> <p>In what areas is better coordination needed?</p>	<p>2. DLA-TRANSCOM Supply Alignment</p> <p>3. DLA-TRANSCOM Efficiencies</p> <p>5. Senior Flag Positions</p> <p>7. Other Recommendations</p>
<p>4. Are TRANSCOM, DLA, Service, and Geographic Combatant Command roles and responsibilities for “end-to-end” distribution properly defined?</p> <p>What are the roles and responsibilities of the Services and GCCs in the distribution process?</p> <p>How well do TRANSCOM and DLA collaborate with the Services and the GCCs, particularly in distribution planning?</p> <p>What is the TRANSCOM-DLA role in improving enterprise-wide asset visibility and achieving end-to-end information sharing?</p> <p>What roles do JDDE and DPO governance play?</p>	<p>4. Service Roles</p> <p>5. Senior Flag Positions</p> <p>6. TRANSCOM as a COCOM</p> <p>7. Other Recommendations</p>

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2. Roles and Functions of the U.S. Transportation Command

A. Introduction

TRANSCOM's creation as a unified combatant command dates to 1987, when strategic transportation components of the Army, Navy, and Air Force were assigned to a single commander for planning and operations. Today, the command's responsibilities are set forth in the Unified Command Plan (UCP), which is approved by the President.⁷ TRANSCOM is specifically a functional component command. As such, it operates in support of the GCCs, and it has "transregional responsibilities" that cut across the assigned geographic locations of the GCCs.⁸

1. Origins

The individual land, sea, and air transportation and logistics components of the U.S. military have a long and storied heritage. For instance, displays in the entrance of TRANSCOM's headquarters pay tribute to the Berlin Airlift (1948), the Red Ball Express (1944), and the merchant mariners of World War II. These distribution operations were led by a single component—air, sea, or land—because there was no joint transportation or deployment commander. The need for better coordination and communication—not only among the Service components, but also with other governmental agencies and commercial transportation providers—was exposed in a 1978 Joint Chiefs of Staff exercise entitled "Nifty Nugget." In a Cold War climate, this exercise simulated a massive deployment of 400,000 troops to central Europe. Yet the logistics supply chains were poor enough that "the Army was simply attrited to death."⁹ The Joint Deployment Agency was established in 1979 to improve coordination, but a similar exercise in 1980 "revealed that the mobilization potential of the United States in response to a NATO military crisis continues to be woefully inadequate."¹⁰

Despite the apparent need to consolidate transportation capabilities across the Services, that option was prohibited by statute in 1982.¹¹ Four years later, however, the time was right, and the

⁷ "USTRANSCOM's Unified Command Plan Responsibilities" (U/FOUO). The earliest version of the Unified Command Plan to include USTRANSCOM is dated March 1, 1988; the most recent is September 12, 2011.

⁸ TRANSCOM is a functional combatant command (FCC) per Joint Publication 1, *Doctrine for the Armed Forces of the United States*, March 25, 2013, III-7: SECTION D. COMBATANT COMMANDERS.

⁹ Fialka (1980, 17). Senator George McGovern stated that "the highly-touted 'Nifty Nugget' exercise concerning mobilization capacity concluded, apparently, that the major problems were in the areas of inter-agency communication, computer updating, coordination of planning responsibilities, and other inter-service and management areas" (*Congressional Record—Senate*, March 20, 1980, 6073).

¹⁰ Fialka (1981, 41). On the creation of the Joint Deployment Agency, see Drea, et al. (2013, 59).

¹¹ Public Law 97-252; 96 Stat. 747; Sec. 1110 (September 8, 1982): Prohibition against Consolidating Functions of the Military Transportation Commands. The prohibition came in response to a 1981 study, which proposed combining Military Sealift Command with the Military Traffic Management Command (the predecessor of the

prohibition against consolidating transportation functions was repealed as part of the Goldwater-Nichols Department of Defense Reorganization Act of 1986.¹² Moreover, the Act directed the Department of Defense to consider creating “a unified combatant command for transportation missions which would combine the transportation missions, responsibilities, and forces of the Military Traffic Management Command, the Military Sealift Command, and the Military Airlift Command.”¹³

Senior leaders in the Pentagon took this opportunity to consider strengthening joint logistics capabilities. Air Force Lieutenant General Alfred G. Hansen, who served as the Joint Staff Director of Logistics (J4) from 1985 to 1987, became concerned early in his tenure as the J4 when he learned that the Joint Staff’s planning for the 1983 invasion of Grenada had not included a logistician.¹⁴ With the support of the Chairman of the Joint Chiefs of Staff, Admiral William James Crowe, Jr., this began to change. General Hansen obtained the chairman’s approval to participate in the planning for the April 1986 air strikes that the United States carried out against Libya. Even still, General Hansen felt a unified transportation command was needed “to solve a myriad of deployment-related planning and execution problems, such as the lack of [in-transit visibility] capability.”¹⁵

In an interview with the research team, General Hansford T. Johnson (who served as TRANSCOM Commander, 1989–1992), stated that prior to 1987, U.S. forces experienced difficulties in receiving and integrating forces upon their arrival into theaters of operation. These problems flowed from the fact that the military Services each had organic transportation capabilities, which they employed in support of their own Service, giving secondary consideration to the needs of the joint forces.¹⁶

Eventually, General Hansen convinced Admiral Crowe that, “We’ll never get this deployment process right unless we give the transportation mission to a CINC [Commander-in-

Military Surface Deployment and Distribution Command). The prohibition states in part that “none of the funds appropriated...in this or any other Act may be used for the purpose of consolidating any of the functions being performed...by the Military Traffic Management Command of the Army, the Military Sealift Command of the Navy, or the Military Airlift Command of the Air Force.”

¹² Public Law 99-433; Sec. 213 (Oct 1, 1986): Repeal of Certain Limitations on Command Structure. The Goldwater-Nichols Act was an outgrowth of the President’s Blue Ribbon Commission on Defense Management, also known as the Packard Commission (it was led by David Packard, co-founder of Hewlett-Packard and former Deputy Secretary of Defense).

¹³ “Goldwater-Nichols Department of Defense Reorganization Act of 1986,” Section 212.
http://history.defense.gov/Portals/70/Documents/dod_reforms/Goldwater-NicholsDoDReordAct1986.pdf

¹⁴ “General Alfred G. Hansen, Establishment of the United States Transportation Command: An Oral History,” conducted by Dr. James K. Matthews, Director, Research Center, United States Transportation Command, Scott Air Force Base, Illinois, March 1999, 8.

¹⁵ Ibid, 10.

¹⁶ General H.T. Johnson, interview with authors, October 18, 2016.

Chief, now known as a Combatant Commander].”¹⁷ In April 1987, based on the recommendations of Admiral Crowe and the Secretary of Defense, President Ronald Reagan approved the establishment of a unified U.S. Transportation Command.¹⁸ This marked the first time that a Joint Chiefs of Staff chairman had forwarded a major recommendation to the National Command Authorities that had lacked consensus among the Joint Chiefs.¹⁹

The first major test for TRANSCOM was Operation Desert Shield/Desert Storm. Between August 7, 1990, and March 10, 1991, TRANSCOM moved “504,000 passengers, 3.7 million tons of dry cargo, and 6.1 million tons of petroleum products,” roughly the equivalent of moving the “population of Atlanta, Georgia, along with their clothing, food, vehicles, and other belongings, a third of the way around the world in just under seven months.”²⁰ General Colin Powell, the chairman of the Joint Chiefs of Staff, reported to Congress that operations Desert Shield and Desert Storm were TRANSCOM’s “‘graduation exercise’ and as far as he, Secretary Cheney, and President Bush were concerned, USTRANSCOM had ‘graduated magna cum laude.’”²¹

TRANSCOM was originally conceived as a wartime transportation provider. In the first few years of its existence, however, it became apparent that it was not always clear where war began and peace ended. During the Cold War, the distinction between mobilization and non-mobilization provided a more definitive break. Additionally, “TRANSCOM’s Service components retained operational command over their forces, controlled procurement and industrial funds, and bore responsibility for performing Service-unique missions.”²² To consolidate transportation functions—both for peacetime and wartime missions—General Powell and the Secretary of Defense, Richard Cheney, worked to make TRANSCOM the single manager for transportation in 1992.²³ The following year, TRANSCOM also became the single manager for global patient movement.

A decade later, Secretary of Defense Donald Rumsfeld, in order to resolve a growing debate on how best to align supply, transportation, and logistic elements within the DOD, designated TRANSCOM as the Distribution Process Owner (DPO) in 2003. This designation specified that:

The DPO shall improve the overall efficiency and interoperability of distribution related activities—deployment sustainment, and redeployment support during peace and war.

¹⁷ Ibid, 26.

¹⁸ Ibid, 55.

¹⁹ Ibid, 27.

²⁰ “General Hansford T. Johnson, Commander in Chief, United States Transportation Command and Air Mobility Command: An Oral History,” conducted by Dr. James K. Matthews and Dr. Jay H. Smith, Scott Air Force Base, Illinois, December 1992, xi.

²¹ Ibid, xii.

²² Drea, et al. (2013, 4).

²³ Ibid.

The DPO is to serve as the single entity to direct and supervise execution of the Strategic Distribution system.²⁴

TRANSCOM's new role as the DPO was included in the 2004 Unified Command Plan. However, due to internal politics resistant to this designation, a formal DOD directive defining DPO "authority, accountability, resources, and responsibility" was not issued until July 2007.²⁵ In an effort to continue consolidating and streamlining transportation functions, TRANSCOM was named the Mobility Joint Force Provider in the 2006 Unified Command Plan. In 2011, the

²⁴ In 1997, the National Defense Panel conducted a study in which it proposed a Logistics Command that would integrate the missions of TRANSCOM and DLA.^a This idea was again asserted in a book by General John Shalikashvili in 2000 (Chairman of the Joint Chiefs of Staff, 1993–1997).^b General John Handy (TRANSCOM Commander, 2001–2005) aggressively pursued the idea of making DLA a component command under TRANSCOM. In his oral history, General Handy states that to get "unequivocal support for the warfighter," he went to "the Secretary with a very bold vision that I firmly and passionately believed in. That is, we ought to have a logistics organization that is empowered to support the warfighter." Ultimately, however, "the negotiated position was, at least get the ownership of the supply chain for DOD within the purview of TRANSCOM. Clearly, there were parts of DLA that I wanted nothing to do with. Acquisition, for example is something they are quite astute at."^c In a February 2003 memo to Secretary Rumsfeld, General Richard B. Myers, Chairman of the Joint Chiefs of Staff, noted his support for "General Handy's suggestion...to move forward with the establishment of a Distribution Process Owner under a single entity," as well as the "merging of USTRANSCOM and DLA."^d Seven months later, after further internal review and a study commissioned by Deputy Secretary Paul Wolfowitz, Secretary Rumsfeld elected to move forward with naming TRANSCOM as the Distribution Process Owner.^e The debate continued, however. In 2006, the Defense Science Board recommended the formation of a Logistics Command, which would combine TRANSCOM, DLA, as well as the Service logistics commands.^f General Norton Schwartz (TRANSCOM Commander, 2005–2008) responded in his oral history that "there are those out there who honestly believe that you have to have a command relationship with everything to make it perform. I don't. It's not true in business. It's not true in DOD.... I would liken creating a joint logistics command to creating [the Department of Homeland Security]. It might be a good idea, but you have to ask yourself if the turmoil and the tumult and the challenge of trying to make an organization like that work are worth it."^g General Duncan McNabb (TRANSCOM Commander, 2008–2011) responded to a similar recommendation from the Defense Business Board: "My biggest issue with the logistics command idea is span of control."^h Sources: *a*. "Transforming Defense: National Security in the 21st Century," National Defense Panel, December 1997; *b*. Shalikashvili et al. 2000; *c*. "General John W. Handy: An Oral History," conducted by Dr. Jay H. Smith and Ms. Lillian Nolan, June 2007, p. 134; *d*. Memo, Chairman of the Joint Chiefs of Staff to the Secretary of Defense: "U.S. Transportation Command/Defense Logistics Agency Integration," 8 February 2003; *e*. Drea et al. 2013, p. 88; *f*. "Defense Science Board Summer Study on Transformation," February 2006, p. 29, 30, 43; *g*. "General Norton A. Schwartz: An Oral History," conducted by Dr. Jay H. Smith, April 2011, p. 34–35; *h*. "General Duncan J. McNabb: An Oral History," conducted by Dr. Jay H. Smith, May 2016, p. 174.

²⁵ See DOD Directive: 5158.04, July 27, 2007: United States Transportation Command; as well as DOD Instruction 5158.06, July 30, 2007: Distribution Process Owner. The quotation is from Secretary Rumsfeld's September 16, 2003 memo, which requested a draft for the directive within 30 days. After nearly three years without a final DOD Directive, the Deputy Secretary of Defense, Gordon England, issued a "Redesignation of Commander, United States Transportation Command as the Distribution Process Owner" (Memo, Deputy Secretary of Defense to the Service Secretaries, Chairman of the Joint Chiefs of Staff, Under Secretaries of Defense, Combatant Commanders, and Director of DLA, May 8, 2006).

command gained two additional responsibilities: the Global Distribution Synchronizer and the Joint Enabling Capabilities Provider.²⁶

2. Responsibilities and Functions

TRANSCOM is the “single-manager for common user transportation.”²⁷ As such, the TRANSCOM commander exercises command authority for three military Service component commands: Air Mobility Command (AMC), Military Sealift Command (MSC), and Military Surface Deployment and Distribution Command (SDDC). Through these commands and the Reserve Components, TRANSCOM directs and contracts for the movement of units and supplies from aerial and sea ports of embarkation to ports of debarkation. It likewise contracts for various domestic movements, such as rail and third-party logistics services. Its international contracts include small package express, heavy airlift shipments, and transport via ocean liners on both scheduled routes and chartered sealift. These services include multi-modal shipments and, in partnership with DLA, freight consolidation.²⁸

TRANSCOM continually plans for a wide range of contingencies, supporting geographic combatant commanders’ deliberate and crisis action planning processes. During the execution phases of a contingency operation, the TRANSCOM Fusion Center is the focal point for planning, controlling, and monitoring the movement of forces and sustainment.²⁹ TRANSCOM controls organic (military-owned) assets—aircraft and ships—that, together with commercial aircraft, ships, and ground transportation, allow it to provide worldwide transportation services. These services include the movement of units (personnel, equipment, and supplies) for peacetime operations and exercises, port opening services, aerial refueling, sustainment of ongoing operations, patient movement, and readiness to meet “surge” demands associated with major contingencies. The size of the organic fleet of aircraft and ships is determined through a requirements process that balances readiness, risk, and costs.³⁰

As noted above, the organic fleet is but one piece of a much larger defense transportation system. TRANSCOM may be thought of as a transportation enabler, as well as a transportation

²⁶ The Global Distribution Synchronizer is similar to the Distribution Process Owner, but with nuanced differences. The former primarily centers on planning (for instance, understanding what challenges would be involved if multiple operational plans needed to be implemented simultaneously), while the latter is more operationally focused in overseeing, coordinating, and aligning the end-to-end distribution process. The reporting chains are also different. As the Global Distribution Synchronizer, the TRANSCOM commander reports directly to the Secretary of Defense. However, as the Distribution Process Owner, the TRANSCOM commander reports to the Defense Logistics Executive (which is the Under Secretary of Defense for Acquisition, Technology, and Logistics).

²⁷ DOD Directive 4500.09E, “Transportation and Traffic Management,” September 11, 2007, 5. This is also a Unified Command Plan designation.

²⁸ USTRANSCOM briefing, “TRANSCOM Enterprise Readiness Center 101,” September 12, 2016, 5.

²⁹ USTRANSCOM Pamphlet 24-2, “United States Transportation Command: Together We Deliver!” August 29, 2014, 6.

³⁰ See, for example, the “Mobility Capabilities and Requirements Study: 2016,” conducted by TRANSCOM and the Office of the Secretary of Defense.

provider. TRANSCOM makes extensive use of commercial transportation providers, both domestically and internationally. It provides the contracts that enable the DOD (and in some cases, the U.S. government) to transport anything from a small parcel to large shiploads of supplies. These contracts take multiple forms. Some allow for broad general use, requiring little to no oversight from TRANSCOM on a day-to-day basis. Small parcel shipping is a prime example. Other contracts involve setting up a network of regularly scheduled routes. This is somewhat analogous to a city planner designing a bus system. TRANSCOM sets the routes in motion and then monitors their usage to appropriately update and change the routes when needed. A third form of contracts covers special movements. This is somewhat akin to hiring a taxi rather than taking a bus, since the special movement may service areas not covered by one of the typical routes—and even for areas that are on a regular route, the special movement can provide more timely and direct transportation. In designing and framing each of these kinds of contracts, TRANSCOM seeks input from its DOD customers, which also helps it to bring DOD’s collective buying power to the negotiating table.

The combined organic and private sector transportation assets owned, contracted for, or controlled by TRANSCOM are referred to as the Defense Transportation System (DTS).

The Defense Transportation System (DTS) is that portion of the worldwide transportation infrastructure that supports Department of Defense (DOD) transportation needs in peace and war. It consists of two major elements: military (organic) and commercial (nonorganic) resources. These resources include aircraft, ships, barges, rail and road assets, pipelines, services, and systems organic to, contracted for, or controlled by DOD. DTS infrastructure, including seaports, aerial ports, railways, highways, pipeline pumping and terminal stations, automated information systems, as well as supporting services, such as in-transit visibility (ITV), customs, and traffic management, are vital elements of the DOD capability to project power worldwide.³¹

Considering the lengthy life cycle for procuring and maintaining military aircraft and ships, TRANSCOM evaluates and adjusts its planned transportation capacity 5, 10, and 15 years into the future. This calculus also includes capacity trends in the U.S. and international commercial transportation industry. For instance, DOD currently has an organic capacity of 15 million square feet on 65 roll-on/roll-off ships, with an additional 4.5 million square feet of roll-on/roll-off capacity on U.S.-flagged commercial ships through the Voluntary Intermodal Sealift Agreement (VISA).³² These ships—organic and commercial—are vital to wartime logistics, historically accounting for 90% of wartime transportation requirements.³³ However, TRANSCOM and Navy planners must take into account that much of the U.S. organic fleet will reach the end of its 50-

³¹ Joint Publication 4-01, *The Defense Transportation System*, June 6, 2013, vii.

³² “Statement of General Darren McDew before the Senate Armed Services Committee on the State of the Command,” May 2, 2017, 10.

³³ *Ibid*, 8.

year service life over the next 10 to 15 years (this includes 4.5 million square feet of roll-on/roll-off capacity, as well as 10 of the 12 special-capability ships used for over-the-shore fuel distribution and crane lift support for austere ports).³⁴ The need to rebuild the organic fleet comes at a time when U.S.-flagged commercial sealift has been shrinking in a stagnant international shipping market. According to General Darren McDew, the TRANSCOM commander, “American shipping companies continue to re-flag vessels to foreign nations, diminishing the size of our commercial fleet, although that fleet stabilized in recent years at around 80 today.”³⁵ On the airlift side, the commercial Civil Reserve Air Fleet (CRAF) provides valuable capacity—historically accounting for 40% of DOD air cargo and 90% of passenger movements.³⁶

Transportation assets owned and operated by DOD play a crucial role in contingency response, particularly in the early phases of a conflict, when commercial transportation assets may not operate due to excessive risk of loss. In particular, flight crews and maintenance personnel associated with these organic assets must train regularly to ensure proficiency in a crisis. While organic assets are more expensive to operate than commercial transportation assets, the transport capacity that these readiness-related training activities produce is considerable. TRANSCOM strives to use that capacity to DOD’s advantage, particularly on routes with high volumes of cargo.

Table 2 provides a breakdown of (appropriated) DOD Operations and Maintenance transportation expenditures in FY 2015. Notably, AMC transportation expenditures are an order of magnitude larger than SDDC or MSC expenditures. Half of that amount is dedicated to training the pilots and crews. Special Assignment Airlift Missions (SAAM) and Joint Chiefs of Staff (JCS) Exercises make up another 41%. In the end, less than 8% of AMC transportation expenditures are devoted to channeling cargo.

³⁴ Ibid, 10–11.

³⁵ Ibid. With China’s slowing economic growth, the international ocean shipping market had a particularly rough year in 2016 (see, for instance, “Global Container Volume on Track for Worst Year Since 2009: Flat growth in the beleaguered shipping industry could set off further bankruptcies and possible acquisitions,” September 27, 2016, Wall Street Journal). Spot rates for ocean freight, as measured by the World Container Index, show that prices are beginning to rebound. As of June 15, 2017, the year-to-date composite average was \$1,566 for shipping a 40 foot container, which is 44% higher than the previous year, but \$122 below the five-year average. (See <https://www.drewry.co.uk/supply-chain-advisors/supply-chain-expertise/world-container-index-assessed-by-drewry>).

³⁶ Ibid, 8.

Table 2. DOD O&M Transportation Expenditures for FY2015 (in millions of dollars)

	<u>Total</u>	<u>Army</u>	<u>Air Force</u>	<u>Navy</u>	<u>Marine Corps</u>	<u>Other DOD</u>
Commercial Transport	3,272	2,237	335	367	106	227
Navy Transport	2,605			2,576	22	7
AMC	5,011	1,088	2,783	173	97	870
Training	2,559		2,559			
SAAM/JCS EX	2,077	907	224	7	77	862
Channel Cargo	375	181		166	20	8
SDDC	576	407	24	27	31	87
Port Handling	469	360	24	1	3	81
Liner Ocean Transport	101	47		26	28	
Global POV	6					6
MSC	456	185	51			220
Chartered Cargo	215		33			182
Afloat Prepositioning	203	185	18			
Surge Sealift	38					38
Total	11,921	3,917	3,193	3,143	256	1,411

Notes: Actual Operations and Maintenance (O&M) transportation expenditures for FY15, as reported in the President's Budget for FY17. Service budgets include budgets for the Active, Guard, and Reserve (based on compilations by LMI for the Logistics Cost Baseline). Numbers may not add due to rounding. SAAM: Special Assignment Airlift Mission; JCS EX: Joint Chiefs of Staff Exercise; POV: Privately Owned Vehicle.

3. Distribution Process Owner

TRANSCOM also serves as the DOD's DPO, giving the command oversight of the worldwide, end-to-end system that moves military units and supplies. The DPO role is discussed in chapter 4, section D.

4. Core Competencies

TRANSCOM's competencies include the following:

- Rapid creation and operation of air, sea, and land bridges
- In-transit visibility (ITV)
- Contracting for transportation services
- Port opening
- Patient Movement

Rapid creation and operation of air, sea, and land bridges. A mantra of TRANSCOM is that they can “deliver an immediate force tonight and a decisive force when needed.”³⁷ The immediate force is delivered using TRANSCOM’s airlift and aerial refueling capabilities to generate “air bridges” that can move forces from the U.S. to anywhere in the world in a matter of hours. The decisive force is large, and the vast majority of this force is best delivered via “sea and land bridges,” using sealift and ground transportation assets, which combine massive volumes with adequate speed. Although an ocean liner can take weeks to cover the distance an airplane can travel in hours, its cargo capacity makes it the fastest means of transporting large amounts of cargo over great distances. Likewise, truck and rail networks provide the throughput capacity needed to move large land forces and sustainment supplies. Forward-stationed forces and pre-positioned equipment and supplies, including afloat pre-positioning, are also vital elements of both the immediate and the decisive forces.

In-transit visibility (ITV). TRANSCOM and DLA maintain in-transit visibility over shipments within the Defense Transportation System. This occurs through internal information systems, as well as extensive interchange with DLA’s enterprise resource planning system and with the information systems of commercial partners. In-transit information is accessible to TRANSCOM’s customers, increasing their confidence that their requested support is being provided, and decreasing the tendency to submit multiple orders when an order is not received in a timely manner. The development of in-transit and asset visibility capabilities has been a joint effort that demonstrates the value of cooperation between TRANSCOM and DLA.

Contracting for transportation services. TRANSCOM’s original charter gave it authority for procurement, but not for acquisition. Acquisition authority was later granted by DOD’s Office of Defense Procurement and Acquisition Policy. Having an internal acquisition office has enhanced the TRANSCOM commander’s connection to the transportation industrial base, enabling the commander to link monetary incentives to desired performance, e.g., attaching a wartime readiness requirement to a contract for peacetime transportation services.

Consolidating transportation acquisition within the TRANSCOM headquarters has also facilitated the use of multi-modal contracts. Previously, TRANSCOM’s component commands arranged acquisitions of land, sea, and air transportation separately. This stove-piped arrangement forced its customers’ shipments to cross many financial and operational seams and often precluded a more effective multi-modal solution. TRANSCOM’s acquisition authority now enables its customers to contract for multi-modal movement from origin to destination in a specified period using a single payment system. This move to multi-modal solutions mirrors the trend in the private sector.

³⁷ General Darren McDew (TRANSCOM commander, 2015–present) frequently uses this phrase in public fora. See, for instance, “Statement of General Darren McDew before the Senate Armed Services Committee on the State of the Command,” May 2, 2017, 22.

Despite uncertainty over the precise operational contingencies that TRANSCOM's customers will face, the command's historical data gives it a baseline for forecasting movement capacity along any given route. About 30 to 40% of TRANSCOM's movement contracts are fixed ahead of time, and the remainder are referred to as "expansion." Most transportation takes place on established lanes; there are more than 3,000 of these lanes, although some of the routes (lanes) may be used sporadically. Additional routes or extra runs on the existing routes comprise the "expansion" capacity that would be needed in a contingency operation.

Port opening. Both TRANSCOM and its Army component command, SDDC, contribute to port opening in a contingency. Joint doctrine describes Joint Task Force–Port Opening (JTF-PO) as "a joint expeditionary capability that enables USTRANSCOM to rapidly establish and initially operate and clear a [port of debarkation] and conduct cargo handling operations to a forward distribution node, facilitating port throughput in support of a [GCC]-executed contingency."³⁸ The JTF-PO's command and control elements are designed to maintain continuous visibility of cargo moving through the port, giving TRANSCOM the capability and corresponding authorities to speed the arrival of forces into a theater of operations.³⁹ In addition, SDDC, as the DOD's single manager for common-user seaports, initially assesses the port's infrastructure and viability. Once supplies begin to flow, it clears the port by moving supplies to a staging area (which can be up to 10 miles away). The theater commander is then responsible for moving materiel beyond the staging area. SDDC employs three 54-person Rapid Port Opening Elements in support of JTF-PO,⁴⁰ which can deploy under the authority of the TRANSCOM commander.⁴¹

Patient Movement. As the single manager for patient movement in the DOD, TRANSCOM has the responsibility for transporting wounded soldiers, sailors, marines, and airmen from the battlefield to hospitals where they can receive competent medical care. Depending on the severity of the injury and the location of medical specialists, this may involve transporting the patient to a hospital that is halfway around the world. Emergency medical care is provided in flight.

5. Other functions

TRANSCOM provides Special Air Mission airlift for the President of the United States, along with the "vice president, cabinet members, combatant commanders, and other senior military

³⁸ Joint Publication 4–09: Distribution Operations, December 19, 2013, II-16.

³⁹ Ibid.

⁴⁰ The 688th and 689th Rapid Port Opening Elements were first assigned to the Army's 7th Sustainment Brigade in 2008. In 2009, they were transferred to SDDC's 597th Transportation Terminal Group. A third Rapid Port Opening Element was assigned to SDDC later that year. See https://www.army.mil/article/21490/SDDC_gains_Rapid_Port_Opening_Elements
<https://www.army.mil/article/30486/rapid-port-opening-element-logistics-first-responders>

⁴¹ Joint Publication 4–09, II-16.

and elected leaders as tasked by the White House.”⁴² This mission is coordinated and executed through the 89th Airlift Wing, and is supported by additional airlift and air refueling aircraft. Depending on the size of the entourage, which can include armored vehicles and other security equipment and personnel, these movements can consume a considerable portion of the airlift fleet.

The Joint Enabling Capabilities Command, based in Norfolk, Virginia, became a subordinate command of TRANSCOM in 2011 when the Joint Forces Command was disestablished. This 600-person organization is “alert-postured” to provide “decisive, rapidly deployable joint command and control capabilities.” It provides a nucleus of functions needed for the formation of a joint task force (JTF), including “joint planning, public affairs, and communications capabilities.”⁴³

Through SDDC, TRANSCOM operates the Defense Personal Property Program, which works in concert with nearly 875 commercial transportation providers to move 70,000 privately owned vehicles and 430,000 household goods shipments per year.⁴⁴ This program provides much of the logistical foundation for the reassignment of military Service members (and their families) to different locations. It also supports official reassignments for DOD civilians. Collectively, this is a \$2 billion annual operation, accounting for a quarter of the U.S. household movement market.

SDDC also conducts a variety of other operations under TRANSCOM’s purview. It operates 23 ocean ports worldwide, including the DOD’s strategic ammunition ocean terminals. It likewise manages and tracks ground transportation of ammunition and explosives throughout the continental United States. It also manages a variety of transportation engineering projects for DOD. (For instance, when the DOD’s Mark Center Building was built in Alexandria, Virginia, SDDC performed the engineering analysis for modifications to the nearby interstate highway interchange.)

6. Organization

Figure 1 depicts the TRANSCOM organization. The headquarters consists of 1,994 people, comprised of 1,158 military and 836 civilian personnel as of FY 2016. TRANSCOM is headed by a four-star flag officer. All of TRANSCOM’s 12 commanders have come from the Air Force—a byproduct of TRANSCOM’s close association with Air Mobility Command.⁴⁵ TRANSCOM’s

⁴² See “Joint Base Andrews: 89th Airlift Wing,” February 26, 2013, <http://www.jba.af.mil/About-Us/Fact-Sheets/Display/Article/336383/89th-airlift-wing/> (accessed June 9, 2017).

⁴³ “Statement of General Darren McDew before the Senate Armed Services Committee,” May 2, 2017, 3.

⁴⁴ Ibid, 13–14.

⁴⁵ In 1992, Air Mobility Command was created from the Military Airlift Command and the Strategic Air Command. From that time until 2005, the Commander of TRANSCOM simultaneously served as the Commander of Air Mobility Command. Even after Air Mobility Command received a separate four-star billet, it has served as a nurturing ground for future TRANSCOM Commanders. Three of the five TRANSCOM Commanders that have served since 2005 first served as Commanders of Air Mobility Command (the exceptions being General Norton Schwartz, 2005–2008, and General William Fraser, 2011–2014).

leadership team includes a three-star deputy commander, a two-star chief of staff, and an immediate support staff of about 50 people.

TRANSCOM headquarters is organized as a standard military staff. Its Manpower and Personnel directorate (J1) manages human resources and staffing issues for both the civilian and military workforce. Its staff of 48 is headed by an O-6 (Colonel/Navy Captain) military officer. The 151-person Intelligence (J2) division is likewise led by an officer in the grade of O-6.

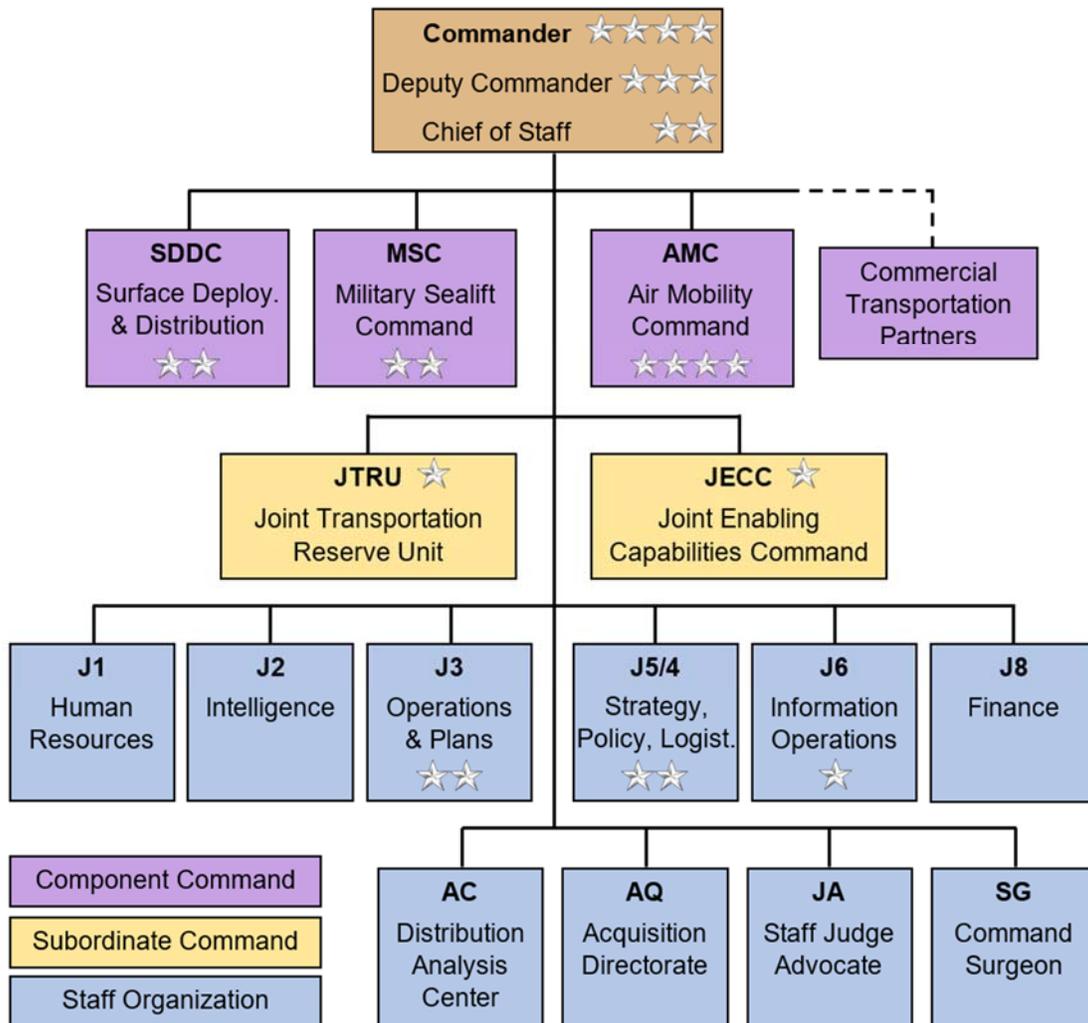


Figure 1. TRANSCOM Organization

The day-to-day management of current transportation movements is conducted in the Operations and Plans (J3) division. This is by far the largest of TRANSCOM's staff organizations, accounting for roughly one-quarter of the total staff. This organization arranges and oversees transportation movements that are occurring now or within the next six months. Distribution plans and arrangements that extend further into the future (such as establishing new distribution networks) are addressed in the Strategy, Capabilities, Policy, and Logistics (J5/4) division. For

instance, anticipating the closure of the ground supply line through Pakistan into Afghanistan, the J5/4 planning staff was instrumental in helping to establish the Northern Distribution Network in 2008 and 2009. More recently, the J5/4 has been involved in creating the West Africa Logistics Network (which is discussed in detail in chapter 5). The J3 and the J5/4 are each headed by a two-star general/flag officer.

The staff organizations include the Command, Control, Communications, and Cyber Systems (J6) division (140 people headed by a one-star officer); an 80-person Program Analysis and Financial Management (J8) division (headed by a senior civilian executive); the Acquisition Directorate (also headed by an SES⁴⁶); and a handful of other organizations. TRANSCOM's patient movement responsibility is executed through the 100-person Command Surgeon division (headed by a medical officer in the grade of O-6). The Acquisition division employs more than 180 contracting officers from a mixed industrial base. This workforce has grown over the last decade as transportation acquisition was consolidated from TRANSCOM's component commands into its headquarters.

While transportation arrangements are directed and monitored by the headquarters, TRANSCOM's component commands are responsible for execution. Each component will be discussed in turn below.

Air Mobility Command (AMC) is an Air Force component with 49,000 active-duty and civilian personnel, supplemented by a 42,000 member Air Reserve Component and a 35,000 member Air National Guard.⁴⁷ It is commanded by a four-star general who reports to the Chief of Staff of the Air Force. The Eighteenth Air Force is AMC's only numbered air force and the Air Force's largest numbered air force.⁴⁸ It includes one expeditionary wing, two refueling wings, four mobility wings, and six airlift wings (including the 89th Airlift Wing, which provides air transportation for the President). It also oversees the 618th Air Operations Center, which "plans, schedules, and tracks tanker, airlift, and aeromedical evacuation aircraft worldwide" for a fleet of 1,300 aircraft.⁴⁹

The Military Sealift Command (MSC) reports to TRANSCOM, U.S. Fleet Forces Command (a four-star Navy admiral), and to the Assistant Secretary of the Navy (Research, Development, and Acquisition). The latter two reporting chains are concerned with Navy-unique matters

⁴⁶ SES: Senior Executive Service.

⁴⁷ "Air Mobility Command: Fact Sheet," July 29, 2016, <http://www.amc.af.mil/About-Us/Fact-Sheets/Display/Article/144014/air-mobility-command/> (accessed June 14, 2017).

⁴⁸ "18th Air Force: Fact Sheet," July 1, 2016, <http://www.amc.af.mil/About-Us/Fact-Sheets/Display/Article/144019/18th-air-force/> (accessed June 14, 2017).

⁴⁹ "618th Air Operations Center: Fact Sheet," June 1, 2016, <http://www.amc.af.mil/About-Us/Fact-Sheets/Display/Article/144041/618th-air-operations-center/> (accessed June 14, 2017).

including combat readiness and procurement policy.⁵⁰ MSC has about 9,700 employees, nearly 80% of whom are stationed afloat. This includes 5,900 civil service mariners and 1,400 commercial mariners. The total workforce is overwhelmingly civilian, with only 1,200 military personnel (of which 330 are assigned to the active component and 870 to the reserve component).⁵¹ It is headed by a two-star admiral. MSC's fleet of 128 ships is divided into five mission areas: Combat Logistics Force, Service and Command Support, Special Mission, Pre-positioning, and Sealift.⁵² For instance, 23 MSC ships are dedicated to sealift, including 10 large roll-on/roll-off (RO/RO) ships, another 5 RO/RO container ships, 6 tankers, and 2 dry cargo ships. The 15 RO/RO ships are maintained such that they are "able to be fully activated and mission ready within five days."⁵³ The Ready Reserve Force has an additional 46 ships (including 27 RO/RO ships) that can be activated as needed.⁵⁴ In FY2016, MSC's sealift program managed the shipment of 37 million barrels of petroleum products and nearly 500,000 tons of dry goods; its Combat Logistics Force program moved an additional 11 million barrels of petroleum.⁵⁵

The Military Surface Deployment and Distribution Command (SDDC) provides land movement and port support for TRANSCOM and is a major subordinate command of the Army Materiel Command. It is a two-star command whose responsibilities include the management of domestic transportation, port operations, personal property movement, container management, ammunition terminals, and transportation engineering. SDDC has 1,775 personnel. In 2005, it had 1,989 personnel, and in 1991 it had 3,737.⁵⁶

Additional elements of TRANSCOM include its two subordinate commands: the Joint Transportation Reverse Unit and the Joint Enabling Capabilities Command—each a one-star command. Finally, TRANSCOM's heavy reliance on and integration with its commercial transportation partners is sufficient to designate them as an unofficial fourth component command.⁵⁷

Figure 2 shows the size of TRANSCOM's headquarters staff by division from FY2005 to FY2016.

⁵⁰ "U.S. Navy's Military Sealift Command: 2016 in Review," 4. (Accessible at <http://www.msc.navy.mil/annualreport/2016/MSCAnnual16.pdf>).

⁵¹ Ibid, 56.

⁵² Ibid, 57. Of the 128, 17 are privately owned ships.

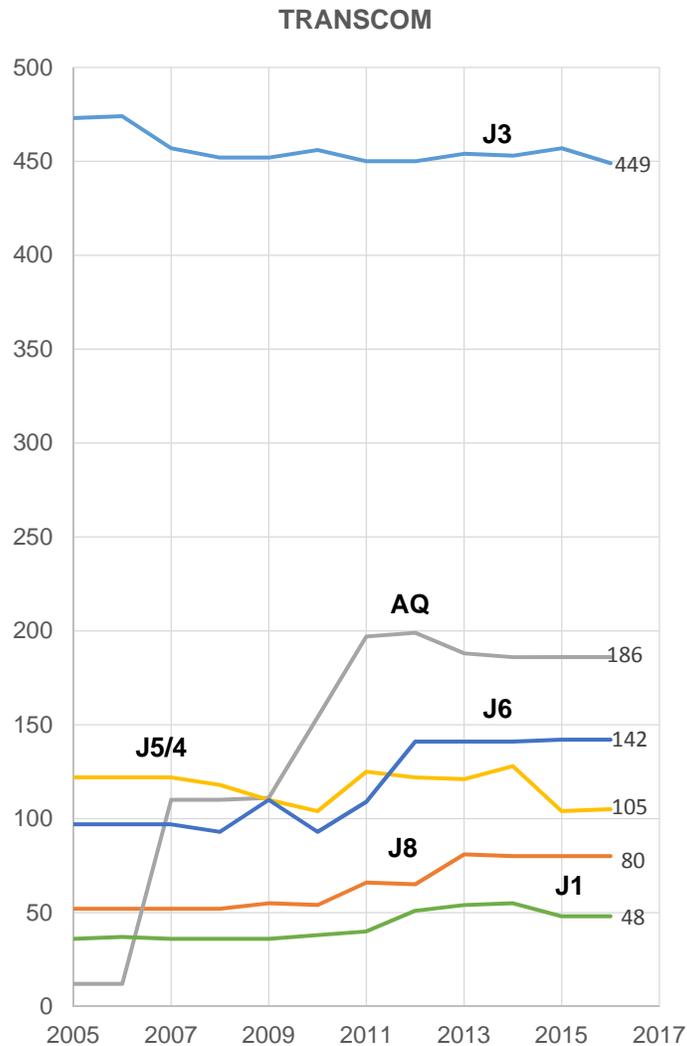
⁵³ Ibid, 24.

⁵⁴ Ibid, 27, 57. The Ready Reserve Force ships are owned by the U.S. Government, but are "maintained and crewed by ship management companies under contract" to the Department of Transportation Maritime Administration.

⁵⁵ Ibid, 50.

⁵⁶ Figures for 1991 and 2005 are from "SDDC: Meeting New Complex Missions and Adapting for the Future: SDDC White Paper, May 2011, 1.

⁵⁷ In oral testimony before the Senate Armed Services Committee on May 2, 2017, TRANSCOM Commander General Darren McDew stated: "...I started calling the commercial industry, my fourth component. I've got an air component. I've got an Army component. I've got a Navy component. But a very important component that we have not looked at in that way is commercial industry."



Notes: J1: Human Resources; J3: Logistics Operations; J5/4: Strategic Plans and Policy; J6: Information Operations; J8: Finance; AQ: Acquisition.

Figure 2. Number of Employees in Select TRANSCOM Headquarters Divisions

7. Governance and Authorities

TRANSCOM’s command relationship to the GCCs and their military Service components is that of a supporting command. The GCC is always the supported command—it sets the transportation requirement and it has the authority to make final decisions on theater-level logistics within its geographic area. Most global transportation assets remain under TRANSCOM’s operational control. This arrangement places a premium on TRANSCOM’s ability to sense and respond to the needs of the GCC.

TRANSCOM controls a significant portion of the transportation assets of the U.S. military, augmented by contracted civilian assets and transportation services. The commander of TRANSCOM has the authority to employ those assets as he or she determines best meets the requirements set by the GCCs. A priority system published in the Defense Transportation Regulation provides a framework for managing competing demands for air transportation based on the type of mission being supported.⁵⁸

TRANSCOM also has extensive planning authority. TRANSCOM is responsible for “synchronizing” and coordinating distribution processes so that they serve the needs of the DOD. The commander does this by working with TRANSCOM’s customers (the GCCs and the Services) and its partners (e.g., DLA) to assess and highlight opportunities, inadequacies, or inefficiencies in the DOD end-to-end distribution system. Part of this collaboration takes place through the Joint Deployment and Distribution Enterprise (JDDE) Governance structure. As discussed in more detail in chapter 4, this governance structure is oriented toward enterprise stewardship, rather than ownership. The TRANSCOM commander chairs the DPO Executive Board (DEB), the senior JDDE body that enables major stakeholders to exchange views, collaborate to identify challenges and opportunities, and solve problems.

8. Performance Metrics

During peacetime, TRANSCOM uses a combination of organic military assets and commercial contracts to fulfill customer requirements through the Defense Transportation System (DTS). As described above, DTS consists of a combination of scheduled and on-demand services. In peacetime, its metrics are focused on time definite delivery (TDD) and related measures, i.e., whether customers receive their shipments on cost and on schedule. In planning for contingency operations and when deploying or sustaining combat forces, the metrics become more operationally oriented.

TRANSCOM plans force movements and tracks system performance metrics via its Single Mobility System (SMS). This system provides a dynamic, real-time interface for tracking incoming transportation requirements, monitoring the degree to which transportation arrangements have been completed, and determining whether the transportation is being executed according to schedule. This tool is maintained by the TRANSCOM J3 and has more than 20,000 active users throughout DOD. It integrates data from the Joint Operation Planning and Execution System (JOPES), Integrated Data Environment/Global Transition Network Convergence (IGC) (the in-transit visibility and asset visibility system), and other transportation systems within the DOD. This combination of systems allows SMS to display transportation requirements and performance from several different vantage points (e.g., by port of embarkation, debarkation, final destination, deployment status, transportation mode, anticipated shortfalls, etc.). The system includes several

⁵⁸ http://www.ustranscom.mil/dtr/part-i/dtr_part_i_app_a.pdf.

high-level summary metrics, which can be parsed into lower-level metrics (for instance, operations performance of air cargo at a particular location).

Table 3 provides an overview of TRANSCOM’s requisitions by destination, DOD supplier, and method of transport. Of the roughly 640,000 requisitions that TRANSCOM processes monthly, 74% originate at one of the 17 continental U.S. (CONUS)-based DLA Distribution Centers (more than one-quarter originate at DLA’s Defense Distribution Center in New Cumberland, Pennsylvania). All told, 94% of TRANSCOM’s shipments originate within CONUS. Furthermore, 80% of shipments are also destined for delivery within CONUS. Thus, the majority of shipments remain entirely within CONUS from beginning to end—and those are extensively handled by the commercial sector. Two-thirds of TRANSCOM’s requisitions that pass outside the CONUS (OCONUS) are handled by commercial air.

Table 3. Summary of TRANSCOM Requisitions

Requisitions	640,000 Monthly Average (Dec 2015 to Dec 2016)			
Service Customer	36.1% Army	32.2% Navy	23.3% Air Force	8.4% Marines
Destination	79.3% CONUS	9.7% PACOM	6.8% CENTCOM	2.6% EUCOM 1.6% Other
DOD Supplier	74.3% CONUS DLA Distr. Centers		26.2% New Cumberland (DDSP)	9.5% San Joaquin (DDJC)
			38.6% 15 other DLA Distr. Centers	
	20.1% Other CONUS		11.6% non-DLA CONUS Depot	8.5% Direct Vendor Delivery
	5.5% OCONUS Depots		2.6% PACOM	2.6% EUCOM; 0.3% Other
CONUS Transport	63.8% Ground		30.8% Local	21.2% Scheduled
			9.8% Small Package	2.0% Less than Load (LTL)
	32.4% Air		28.3% Small Package	4.1% Parcel Post
	3.8% Misc.			
OCONUS Transport	66.2% Commercial Air	23.8% Military Air	10.0% Ocean	

Note: Percentages are based on the number of requisitions (not the size, weight, or value of the cargo).

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3. Roles and Functions of the Defense Logistics Agency

The Defense Logistics Agency supplies, stores, and distributes most consumable and repairable items for the DOD. Its primary function is to provide food, clothing, fuel, construction materials, personal items, medical supplies, and consumable repair parts for U.S. military demands throughout the world. It is not responsible for managing depot-level repairables, ammunition, or major weapon systems. (The Services maintain that responsibility; the Army in particular is responsible for ammunition).

DLA is a defense agency—one of 19 currently in the DOD—with a chartered mandate to “provide effective and efficient worldwide logistics support...under conditions of peace and war.”⁵⁹ As such, it has the further designation of being a Combat Support Agency. The chairman of the Joint Chiefs of Staff regularly evaluates DLA’s wartime readiness and reports to Congress every two years on DLA’s “responsiveness and readiness...to support operating forces in the event of a war or threat to national security.”⁶⁰

The DLA director is a three-star flag/general officer who oversees approximately 26,000 employees, the majority of whom are civilians. Military personnel account for roughly 3% of personnel, and they occupy several of DLA’s leadership positions.⁶¹ This workforce processes more than 35 million orders per year, totaling about \$33 billion in sales in FY2016. Table 4 breaks down these sales and orders for each of DLA’s supply chains.

DLA’s history reflects a series of consolidations. The centralized DLA organization of today has replaced hundreds of field offices, warehouses, and other functions that were scattered throughout the military Services and other DOD components. Initially given responsibility for managing 87,000 items in 1962, DOD has progressively consolidated control to DLA, bringing its managed inventory to approximately 4.2 million items today. The economies of scale that accompanied this growth made DLA, and its customers, much more efficient. DLA grew from 33,000 people in 1965 to 65,500 in the early 1990s, and stands at 26,000 today.⁶²

⁵⁹ DODD 5105.22, “Defense Logistics Agency (DLA),” May 17, 2006, § 3.

⁶⁰ 10 USC 193 (a)(1)(A).

⁶¹ The “Defense Manpower Requirements Report: Fiscal Year 2017” (dated April 2016) estimated that DLA would have 26,558 employees in Fiscal Year 2017, including: 25,665 civilians; 561 active duty; and 332 selected reserve members (13). DLA’s headquarters has 62 of these military personnel and roughly 1,135 civilian employees (18).

⁶² Graham *et al.* (2001), I-14 (for historic employment numbers).

Additional activities, such as the disposition of excess materiel, the management of the nation’s stockpile of strategic materials, DOD printing services, mapping services, and numerous other functions have also been added to DLA’s stewardship. In 1990, for example, all contract administration services in the DOD (spanning 26,000 civilian personnel) came under the purview of DLA. After a decade in DLA, the result was a much leaner, streamlined group of 12,500 that was then spun out as the Defense Contract Management Agency.⁶³

Table 4. Sales and Orders in DLA’s Nine Supply Chains

<u>DLA Supply Chain</u>	<u>Sales (\$M)</u>		<u>Orders (M)</u>	
	<u>FY 15</u>	<u>FY 16</u>	<u>FY 15</u>	<u>FY 16</u>
Subsistence (Class I)	2,275	2,268	10.8	11.7
Clothing and Textiles (Class II)	1,560	1,668	4.5	4.5
Construction and Equipment (Class IV)	3,028	3,146	0.9	1.0
Medical (Class VIII)	6,318	6,683	9.1	9.3
Industrial Hardware (Class IX)	628	647	2.6	2.8
Aviation (Class IX)	4,213	4,362	2.5	2.7
Land (Class IX)	1,835	1,796	3.0	3.1
Maritime (Class IX)	1,583	1,690		
Subtotal	21,441	22,260	33.4	35.1
Energy (Class III)	15,211	10,269		
Total	36,651	32,529		

Note: Land and Maritime orders are combined. The fall in Class III energy sales reflects the market drop in fuel prices rather than a substantial change in quantity purchased.

1. Origins

Efforts to consolidate and standardize the procurement and distribution of supply items began in earnest during and in the wake of World War II.⁶⁴ An initial consolidation in the 1950s assigned the management of different classes of supply to each of the military Services. The Army, for instance, was tasked with managing food and clothing, while the Air Force was given charge of electronics. At the same time, Congress was calling for the development of an authoritative catalog

⁶³ Ibid, I-9.

⁶⁴ Shortages during the war prompted close coordination across the Services in procuring supplies. As of 1947, the Army ran seven supply systems and the Air Technical Service Command; the Navy ran 18 supply systems, one of which was the Quartermaster of the Marine Corps. The National Security Act of 1947, which combined the cabinet level Department of War and the Department of the Navy into a single Department of Defense (then called the National Military Establishment), provided further impetus for coordination and consolidation. At the request of President Harry Truman, former President Herbert Hoover oversaw a commission on restructuring the executive branch. In 1949, the commission recommended providing the Secretary of Defense with greater authority to consolidate and integrate defense supply functions across the Services. See Graham et al. (2001), I-2.

of defense-related supply items, together with standardization in packaging and parts.⁶⁵ The Department of Defense Reorganization Act of 1958 then granted the Secretary of Defense greater authority over the department's internal structure, including the ability to establish defense agencies.⁶⁶ These developments set the stage for department-wide consolidation.

Within the first year of his tenure as Secretary of Defense, Robert S. McNamara established the Defense Supply Agency, the forerunner of the Defense Logistics Agency. In an August 31, 1961, announcement of the new agency, Secretary McNamara cited the potential to reduce inventories by \$2 billion to \$4 billion. Two weeks later, he instructed Lt Gen Andrew McNamara (no relation) to return "post-haste" from his duties in Korea to head the agency. The Defense Supply Agency was operational by January 1, 1962.⁶⁷ However, its creation was met with opposition from the military Services. Moreover, a House of Representatives subcommittee was notably concerned that the agency's work force was projected to grow from 10,000 in February 1962 to 23,000 in June 1963.⁶⁸ The nascent agency did have a saving grace: cost savings. From FY1963 through FY1965, the Defense Supply Agency posted total cost savings of \$2.8B (in 2017 dollars), solidifying its existence.⁶⁹

The role of the Defense Supply Agency continued to expand, consolidating contracting activities in 1965, assuming worldwide management of coal and petroleum in 1972, and then providing food support for commissaries in 1973.⁷⁰ It was also tasked with centralized disposal of government property in 1972 (now known as DLA Disposition Services). The combined savings of these transfers were significant, with the Defense Supply Agency executing these functions with 7,000 fewer workers.⁷¹ Given the organization's expanding role, it was renamed the Defense Logistics Agency on January 1, 1977. The Goldwater-Nichols Department of Defense Reorganization Act of 1986 (Public Law 99-433) highlighted DLA's warfighting support role by designating it as a Combat Support Agency.

Responsibility for most consumable spares moved from the Services to DLA in the 1980s. It took on the management of the nation's stockpile of strategic materials in 1988. In July 1989,

⁶⁵ 10 USC 145: Cataloging and Standardization (enacted July 1, 1952, with revisions on August 10, 1956 and September 2, 1958).

⁶⁶ "Whenever the Secretary of Defense determines it will be advantageous to the government in terms of effectiveness, economy, or efficiency, he shall provide for the carrying out of any supply or service activity common to more than one military department by a single agency or such other organizational entities as he deems appropriate" (Section 202c(6) of the Act).

⁶⁷ See "History of the Office of the Secretary of Defense: The McNamara Ascendancy: 1961–1965" 26 (see http://history.defense.gov/Portals/70/Documents/secretaryofdefense/OSDSeries_Vol5.pdf, accessed May 11, 2017). The Defense Supply Agency was officially established on October 1, 1961.

⁶⁸ *Ibid*, 27.

⁶⁹ *Ibid*, 29. Cost savings in then-current dollars were \$61.8M in FY1963, \$99M in FY1964, and \$197M in FY1965.

⁷⁰ See "History of DLA" (<http://www.dla.mil/AboutDLA/History/>, accessed May 11, 2017).

⁷¹ See Graham, et al. (2001), I-5, 6 (citing Appendix G, DLA, G4, OSD Report: Reassessment of Defense Agencies and DOD Field Activities, October 1987, in response to the Goldwater-Nichols DOD Reorganization Act of 1986).

Secretary of Defense Richard Cheney submitted the Defense Management Report, which called for the DOD to cut excess infrastructure, to President George H.W. Bush. Consequently, all DOD distribution depots were transferred to DLA for consolidation between 1990 and 1992.⁷² In 1991, the DOD employed 31,531 personnel in distribution depots: 23,076 in depots run by the Services that were transferring to DLA, and 8,455 that were already in DLA distribution depots. By the year 2000, DLA had cut this workforce down to 9,082—a 71% reduction.⁷³ A defense-wide consolidation of contract administrative services occurred at the same time (as mentioned earlier). This also resulted in an increase in productivity and a dramatic reduction of contracting employees, from 26,000 in 1990 to 12,500 in 2000.

The 2005 Base Realignment and Closure (BRAC) Commission resulted in several more department-wide consolidations into DLA. Most notably, DLA became responsible for managing retail supply at military Service maintenance depots. Up to this point, the depots had purchased repair parts from DLA. These parts were then owned and managed at the level of the individual depot. The BRAC 2005 change envisioned that if DLA owned and managed inventories all the way down to the depot level, it could more efficiently manage department-wide stocking levels of repair parts, decreasing aggregate inventories and associated costs. DLA began managing retail supply in Air Force and Navy depots in 2008. (The effort in Navy shipyards was unsuccessful, and was cancelled. Contrary to the intent of BRAC 2005, the Army and Marine Corps have persisted in maintaining control of retail distribution at their depots.) For an organization that is steeped in a strictly wholesale culture, DLA's transition to a wholesale/retail organization has been rocky and challenging, although progress is being made. A 2014 IDA review concluded that "The BRAC decision caused DLA and its industrial customers in the Air Force and the Navy to adopt practices [that resulted in DLA being] much more integrated into the production planning processes of its customers."⁷⁴

2. Responsibilities and Functions

DLA's core competencies include the following:

- Demand Planning (Forecasting)
- Inventory Management
- Storage and Distribution
- Contracting (Purchasing Supplies)
- Enterprise Resource Planning (ERP) system to run the entire business

⁷² Lt Gen Charles McCausland, the DLA director who presided over this change reflected, "It was always difficult as you grew and got new missions assigned to you, because they were not given freely. They were given with some resistance. But I think in the long run...there was a realization that DLA was able to respond." See Moore, S, "50 Years of Warfighter Support: Gold-Standard Logistics," *DLA Loglines*, Sep–Oct 2011, 4.

⁷³ Graham, et al. (2001), I-8.

⁷⁴ Richanbach, et al. (2014), 43 (see also 23–25, 42–44).

Demand Planning. DLA relies heavily on two sources in forecasting future demands: historical demand data and collaborative planning with customers. The historical data is tracked in DLA's enterprise resource planning system and provides a valuable benchmark for usage rates under various conditions. That said, managing more than 4 million distinct inventory items, many of which are low-volume items with sporadic demands, requires an ongoing dialogue with its customers. For instance, DLA can better service industrial depots if it is kept abreast of military Service maintenance plans for weapons systems. Knowing this information far enough into the future gives DLA the lead time it needs to procure any rarely used items. Unfortunately, with aging weapons systems and the churn of military operations, last minute or unexpected repairs are inevitable. This leads to a demand for spare parts that can be difficult to meet on short notice.

As an example, in conducting regular maintenance on an aircraft, technicians may discover an unanticipated flaw in a structural component. To make matters worse, the aircraft is old, the technical data for addressing this flaw may be incomplete, and engineering and manufacturing a replacement may take several years. Furthermore, the prevalence of this flaw in other aircraft of the same type is unknown and may take years to identify. In these cases, the ability of DLA and its Service customers in the depots to forecast demand with any certainty is nearly impossible.⁷⁵

Inventory Management. Maintaining large inventories in warehouses is not always a viable option. Many low-volume items are expensive to purchase or store, and may also risk spoilage or obsolescence. The expected cost of storing and not using an item must be balanced against the expected cost of failing to meet a given demand within a certain window of time. In addition to trade-offs with what to stock, there are further trade-offs with how much to stock. Bulk orders may result in lower per unit costs, but the carrying costs are higher, and the risk that an item is never used can still be a concern. If the order is too small, the stock may run out before the next order comes in. Analyzing these factors with input from its customers, DLA determines stock levels and locations—a process that additionally factors in transportation costs based on the likely end users. (As a result, DLA has to work with two competing metrics: (1) percentage of orders met within a defined period of time; and (2) dollar value of excess/unnecessary inventory. Leaning forward to meet customer needs (1) results in the risk of greater excess or unnecessary inventory (2).)

DLA actively stocks about 1.2 million items. Many of these are high-demand items or items with clear demand profiles that are fairly straightforward to forecast. Other items are maintained at specific levels, per customer requests. Finally, based on statistical analyses and algorithms, DLA also stores select items that are characterized by frequent but sporadic demands, as well as some items that have both infrequent and sporadic demands by using alternative forecasting methodologies.⁷⁶

Storage and Distribution. DLA operates four buying command (or inventory control) points, which are responsible for contracting for and procuring supplies: DLA Land and Maritime

⁷⁵ Richanbach, et al. (2014), 11-12.

⁷⁶ Richanbach, et al. (2014), 12-13.

(Columbus, Ohio), DLA Aviation (Richmond, Virginia), DLA Troop Support (Philadelphia, Pennsylvania), and DLA Energy. These commands procure items in two primary ways. Using Direct Vendor Delivery (DVD) and Prime Vendor (PV) contracts, DLA will arrange for the goods to be shipped by the manufacturer directly to the end-users. This method is used for most subsistence and medical supply items. This allows DLA to avoid physically touching the product as a middleman. The other procurement method is for DLA to receive, store, and issue items through its warehouses. This function is carried out by DLA Distribution, which has two dozen distribution centers and several other detachment locations throughout the world. Here, transportation is facilitated by TRANSCOM contracts—in particular, DTCI services most types of shipments within CONUS.⁷⁷ DLA Distribution directly interacts with the DTCI contractors, with SDDC providing customer support for issues such as late pickups or deliveries. SDDC also looks at trends in these issues and elevates them to the attention of the contractor.

Contracting (Purchasing Supplies): DLA awards approximately 450,000 contracts per year. Additionally, it executes millions of other contract actions annually, including contract modifications and purchases that fall within the terms of existing contracts. Much of this process is now automated—thanks in large part to the successful implantation of DLA’s ERP system, the Enterprise Business System (EBS)—resulting in faster processing times and a more efficient use of employees.

Enterprise Resource Planning (ERP). The whole of DLA’s operations—spanning its buying commands, distribution centers, disposition functions, headquarters, and the remainder of the organization—are integrated through its enterprise resource planning system, EBS. Developed in the mid-2000s, EBS has provided an avenue for bridging and standardizing business processes across the many parts of this organization. Data on DLA operations and orders are maintained and recorded within EBS. These data are then used to better facilitate DLA’s ability to execute each of its core capabilities.

3. Responsibilities and Functions

DLA is headed by a three-star general/flag officer, who is assisted by a civilian deputy director. In addition to the four buying commands (Aviation, Land and Maritime, Troop Support, and Energy), the two other main operating elements are Distribution and Disposition. DLA Distribution operates distribution centers in the U.S. and around the world, where DLA stores and/or processes items for delivery to its customers. DLA Disposition is responsible for the disposal of all excess DOD property.

The chain of command for all employees runs up to the director of DLA. This is quite different from TRANSCOM, where, outside of the headquarters staff, most employees are part of

⁷⁷ Exceptions include small packages, certain hazardous materials, and oversized loads (by either size or weight). The new Defense Freight Transportation Services (DFTS) contract will handle oversized loads. Small package delivery for the entire U.S. government will be managed through the new Next Generation Delivery Service contract, which TRANSCOM will manage.

an organization that supports TRANSCOM, but reports elsewhere. Thus, the director of DLA has far more direct control over the DLA enterprise than the commander of TRANSCOM has over the TRANSCOM enterprise.

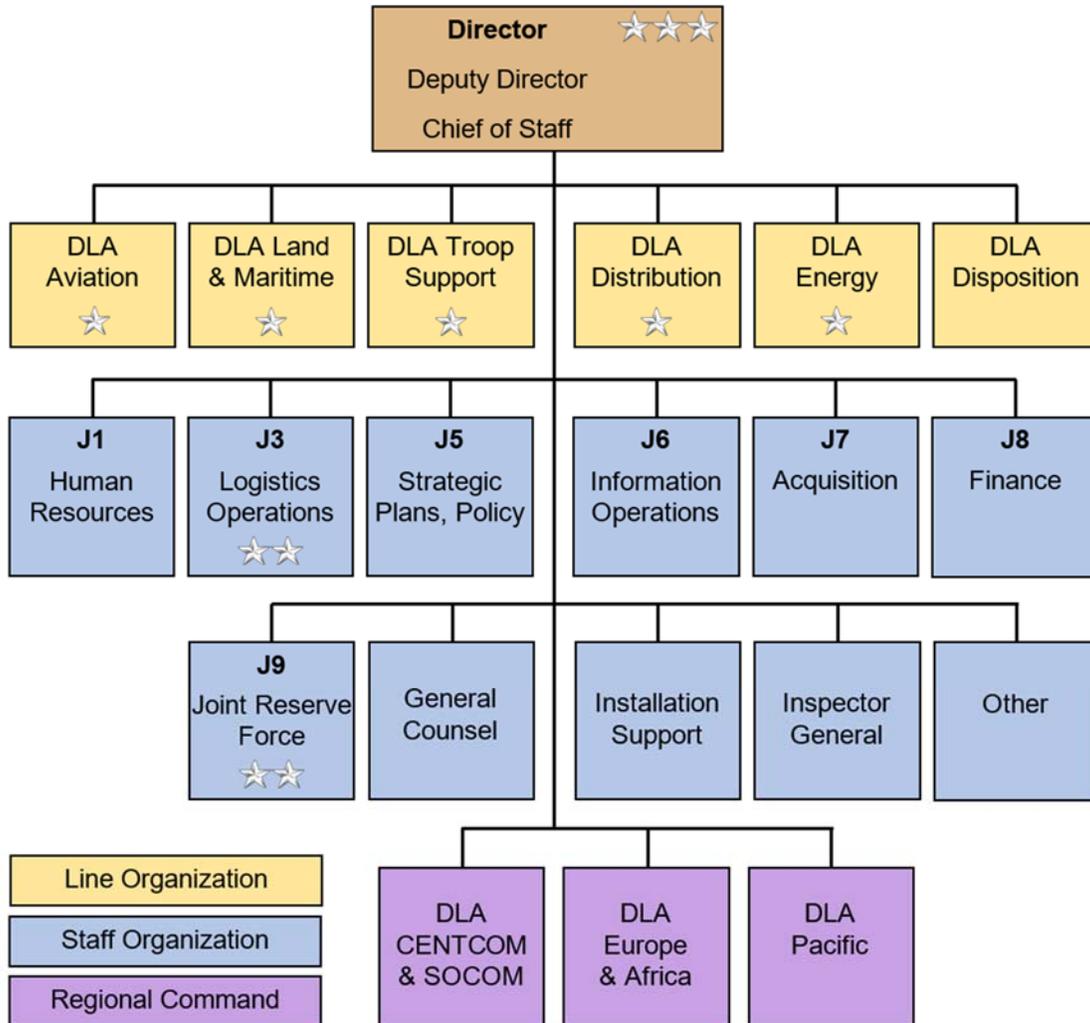


Figure 3. DLA Organization

4. Other Functions

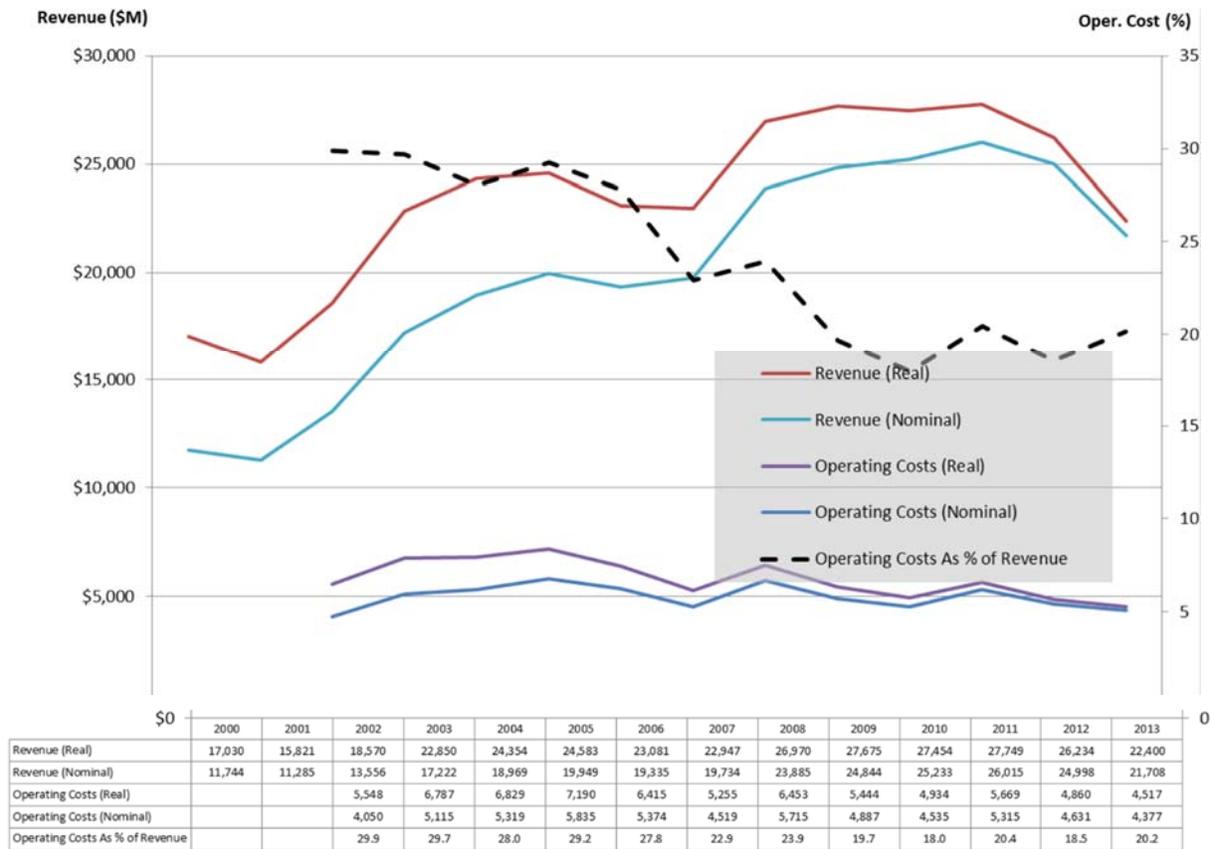
In addition to managing human resources for its own staff of more than 26,000 employees, DLA provides human resources support to more than 40,000 civilian employees in the Office of the Secretary of Defense and in other DOD agencies and field activities.⁷⁸ Managing human resources for the civilian component requires a more robust legal back-office than for the military component, so consolidating the overhead cost for civilian hiring can be prudent. The DLA director has statutory authority to issue human resource policy, which enables DLA to fill jobs

⁷⁸ See “DLA Human Resources (J1)” (<http://www.dla.mil/HQ/HumanResources/Leaders.aspx>, accessed May 19, 2017).

faster and provide better service than many other DOD organizations. In contrast, combatant commands, including TRANSCOM, tend to tap into the civilian hiring procedures of one of the military departments—but those procedures tend to be fraught with more red tape.

DLA has a strong, demonstrated capability for fielding information technology. Besides running what is arguably one of the most well-functioning enterprise resource planning systems in the DOD, DLA also services several business systems and IT projects for other parts of the DOD (including for the Office of the Secretary of Defense and the military departments). Staffed with long-term civilian expertise in various IT fields, DLA is able to provide technical expertise that cannot always be matched by short-term rotational military staffs in other parts of the DOD. (When the Business Transformation Agency was disestablished, DLA absorbed most of its personnel and functions.)

Figure 4 shows how DLA's revenues and operating costs have changed since 2000. The main point to be observed here is that while its revenues are subject to large increases and decreases—due, for example, to demand shifts from the military Services for the conflicts in Afghanistan and Iraq—DLA's operating costs hold steady or are in decline. The declines in operating costs are primarily the result of cost-cutting measures pursued by successive DLA directors, under the watchful eye of OSD. This shows the “high fixed cost, low marginal cost” nature of DLA's business, and illustrates the wisdom of DOD's policy decisions, stretching back 50 years, to consolidate supply into one organization. DOD is taking advantage of economies of scale to load as much business as possible onto a non-redundant fixed-cost base.



Source: Richanbach et al. (2014, p. 22)

Figure 4. DLA Revenues and Operating Costs

5. Metrics

DLA is a metrics-heavy organization; it uses a wide suite of metrics to track and evaluate its performance. Some of the top metrics that it uses for internal evaluation are as follows:

Material Availability. This tracks the fraction of items ordered by customers that are immediately available for release, regardless of whether the item is stocked directly by DLA or whether it is stocked and supplied by one of its vendors. Figure 5 shows a 10-year picture of material availability across seven of DLA’s supply chains (the lines are smoothed with a six-month moving average). Subsistence availability has nearly a 100% track record, and medical supplies are only a small step behind. Given how readily available these items are in commercial marketplaces, and that these items flow directly from the vendor to the customer without DLA’s involvement, these high rates of performance are perhaps unsurprising. Most of the other supply chains demonstrate an overall positive trend, although some appear to have plateaued in recent years. Availability of Class IX consumable repair parts (Industrial Hardware, Aviation, and Land and Maritime supply chains) has improved by several percentage points over the last decade, rising from a range of 79%–85% in 2007 to 89%–92% today.

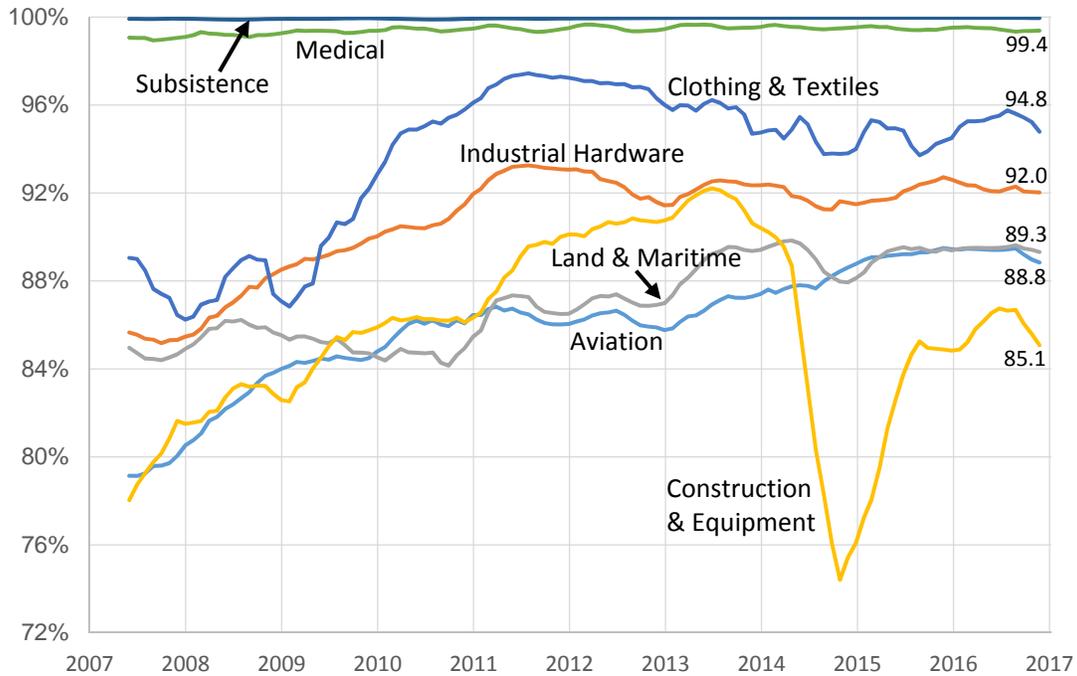


Figure 5. Material Availability for DLA's Supply Chains (six-month moving average)

Order Volume. This is the number of orders that customers place. Although this is tracked on an item-by-item basis, when aggregated to the level of any particular supply chain, order volume is highly cyclical (see Figure 6). Most supply chains climb to a peak in August and September as the fiscal year is closing. Orders then fall to a trough in December. This pattern is almost purely a function of the budgetary rules in the DOD, but DLA's sales must cope with this annual ebb and flow. Subsistence purchases follow a different trend, with two peaks per year: one in April or May and the second in October or November. Order volumes are helpful for establishing trends and forecasting future demands.

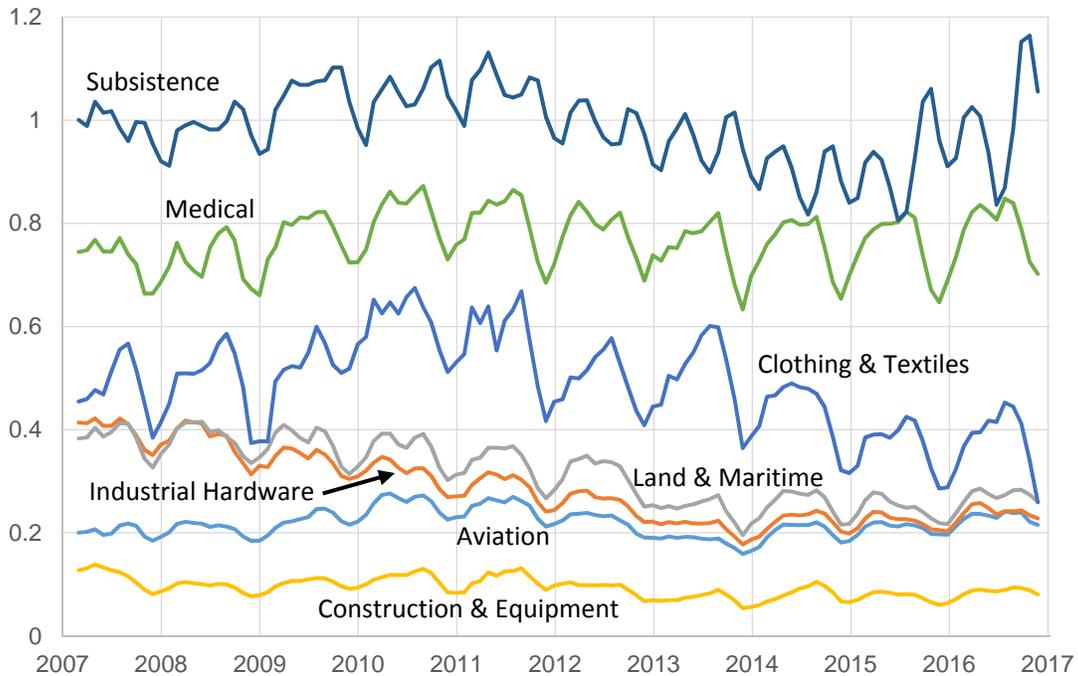
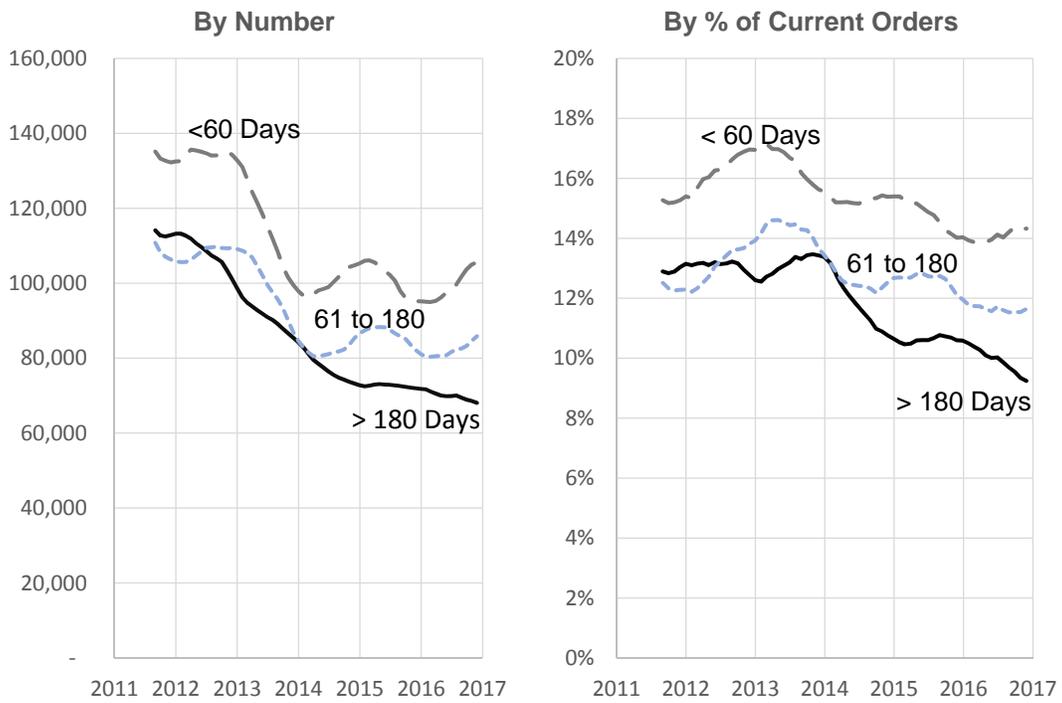


Figure 6. Millions of Orders per Month for DLA's Supply Chains (three-month moving average)

Total Actionable Backorders. This is the current number of orders that are in backorder status, regardless of how long they have been in backorder. Actionable refers to DLA's ability to take some reasonable action to help expedite the fulfillment of that order.

Aged Backorders. This is the subset of actionable backorders that have been in backorder status for more than 180 days. Figure 7 breaks down backorders for Class IX repair parts by the length of time an item has been in backorder status. As the panel on the left shows, the sheer quantity of backorders has decreased considerably in recent years. However, a large portion of this decrease simply reflects a smaller number of total orders. As a percentage of current orders (the panel on the right), real improvement appears to be largely limited to aged backorders.

The main point to take away from DLA's use of metrics is how amenable its business is to the use of quantitative metrics, and how thoroughly DLA and OSD management rely on those measures.



Note: For the plot on the right, the underlying number of orders is likewise based on a 12-month moving average.

Figure 7. DLA Backorders for Class IX Repair Parts (12-month moving averages)

4. TRANSCOM, DLA, the GCCs, and the Services

A. Roles and Responsibilities for End-to-End Distribution

The Geographic Combatant Commanders are responsible for all activities within their assigned geographic regions. This includes setting requirements and priorities for units and sustainment. They are responsible for planning, including the war plans for major contingencies, smaller contingencies, and exercises. Logistics, distribution, and sustainment are critical elements of all planning efforts; consequently, TRANSCOM and DLA are active participants in many GCC planning activities and processes.

The GCCs and their Service components are responsible for intra-theater distribution. TRANSCOM is responsible for strategic or inter-theater transportation. The boundary between inter- and intra-theater distribution is a long-standing doctrinal distinction.⁷⁹ The flow to and across theater boundaries is conducted via close coordination between TRANSCOM, the GCC, and most often the Army, which has executive agent responsibility in most instances for intra-theater distribution.

At the same time, DLA works with TRANSCOM, the GCC, and the Services to coordinate the delivery of supplies to specific locations. In addition to monitoring its shipments made by TRANSCOM through DTS, DLA is also contracting with local vendors of food and other supplies, and must coordinate those intra-theater deliveries with the GCC. (These intra-theater services are provided on behalf of the GCC and are similar to Direct Vendor Delivery or Prime Vendor deliveries in CONUS, for which DLA is also the contractor.)

Figure 8 provides a high-level view of the main components of the “end-to-end” distribution system, and the boundaries separating or connecting different organizations and activities. In addition to identifying the main actors and high-level flows from “factory-to-foxhole,” the key point of this illustration is to note the (traditional) distinction between inter- and intra-theater distribution.

Figure 9 depicts many of the core elements and flows of DOD’s end-to-end distribution system. For most classes of supply, goods are procured by an inventory control point (column one). Such points are the principal gateways to DOD ownership. DLA operates three inventory control points: DLA Land and Maritime (electronics and construction items); DLA Troop Support (clothing and textiles; medical; general and industrial; and subsistence); and DLA Aviation (aviation items).⁸⁰ The Services operate another dozen inventory control points.

⁷⁹ See, for instance, *Joint Publication 4-0: Joint Logistics* (October 16, 2013), III-7, V-3; and *Joint Publication 4-01: The Defense Transportation System* (June 6, 2013), Chapter II: Interrelationships.

⁸⁰ See “DLA Inventory Control Point Points of Contact” at <http://www.dla.mil/LandandMaritime/Offers/Services/TechnicalSupport/Logistics/Packaging/DLAICPPOC.aspx> (accessed May 17, 2017).

Inventory control points may directly receive the goods (going into one of the “items owned or possessed by” boxes in the figure), or they may contract to have the goods sent directly to the end-user or a consolidation point. Direct vendor delivery and prime vendor contracts that stay within CONUS typically ship directly from the commercial supplier (“factory”) to the DOD end-user (“DVD or PV1”), while prime vendor contracts that are destined overseas are sent to a DLA consolidation point (“PV2”).⁸¹

DLA’s Distribution Centers (column four, “Inventory Reception” in Figure 7) form a hub of activity that directly connects into the Defense Transportation System. DLA Distribution interfaces closely with SDDC in making shipping arrangements; DLA Distribution initiates the process, and SDDC uses the suite of TRANSCOM contracts to match the order with a shipper. (With many contracts, such as a shipment that meets the requirements for DTCI, this is automatic.) DLA Distribution then prepares the shipment according to the particular arrangements. (See the column labeled “Inter-Region of CONUS Transport” in Figure 6.) A key point with respect to TRANSCOM-DLA collaboration is that DLA acts as a customer of SDDC to book transportation through the Defense Transportation System. For routine shipping arrangements, however, DLA is interfacing directly with the shipping contractor. SDDC primarily plays the role of customer support when problems arise or for unusual shipments. Still, in terms of day-to-day operational actions, this is one of the closest ties between TRANSCOM and DLA. A second key feature of TRANSCOM-DLA collaboration is their joint in-transit visibility. This is represented by the red lines and arrows in the figure.

For TRANSCOM, the “final” delivery point is the delivery point requested by the customer. TRANSCOM has “Door to Door,” “Door to Port,” “Port to Door,” and “Port to Port” shipments. “To Door” shipments (see the column labeled “Intra-Region”) can be to any destination agreed upon by TRANSCOM and its customer. But, once it is delivered to that “door,” it leaves TRANSCOM’s system and TRANSCOM typically does not have continued visibility of that item. DLA also loses visibility of items once they have been delivered to their customers. However, DLA does operate Distribution Centers within various theaters, and it is often using Prime Vendor contracts to deliver food, water, and other consumables throughout a theater. In some cases—as frequently happened in Iraq and Afghanistan—DLA will, at the request of its customers, arrange for onward movement of materiel within a theater. (See the last column, “Last Mile.”) In other words, not all “last tactical mile” movement is conducted by the Service components in a theater.

⁸¹ Bracken and Graham (2017) confirms that the vast majority of CONUS to OCONUS prime vendor contracts are routed to a DLA consolidation point for overseas shipment within the Defense Transportation System.

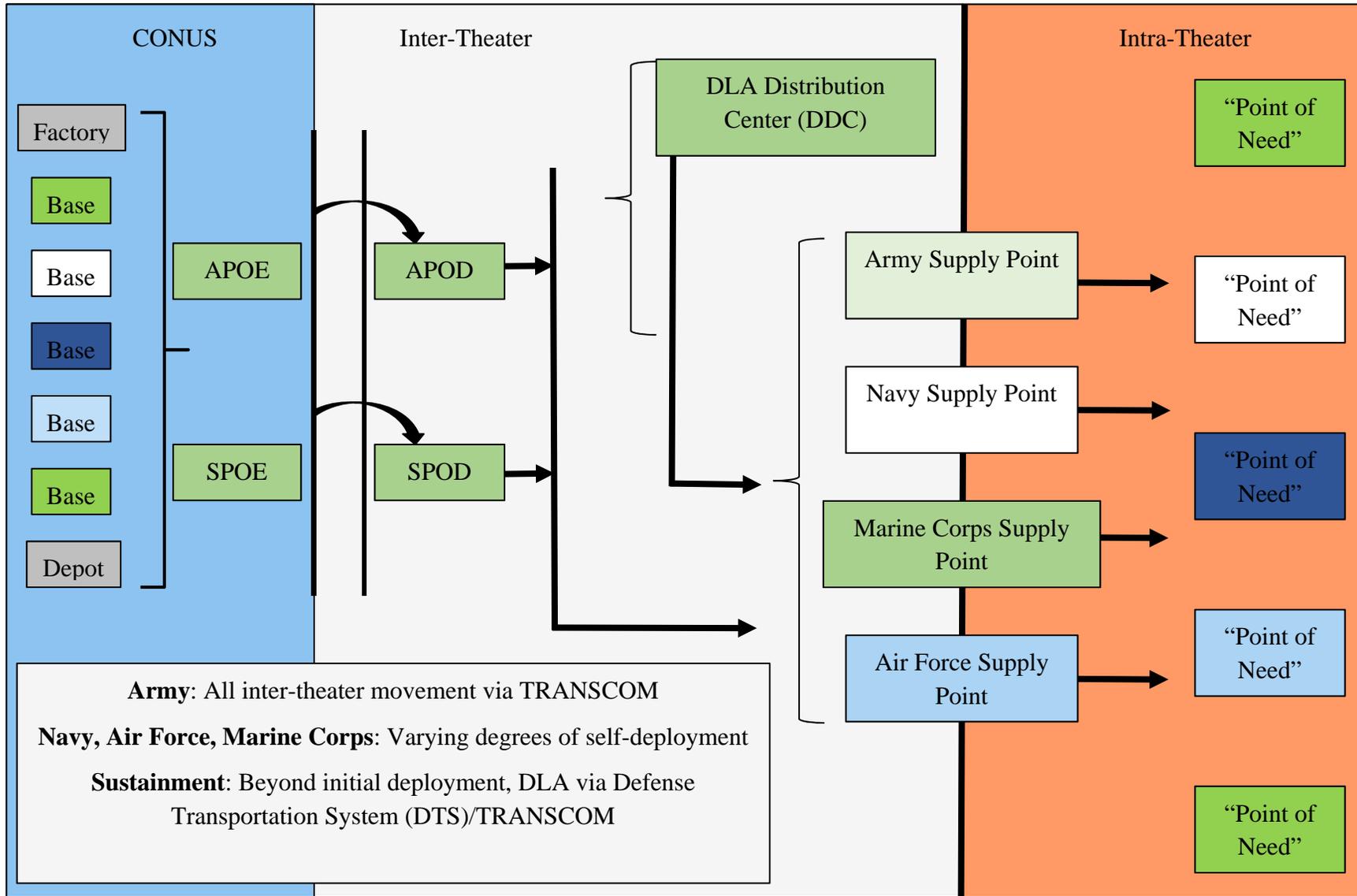
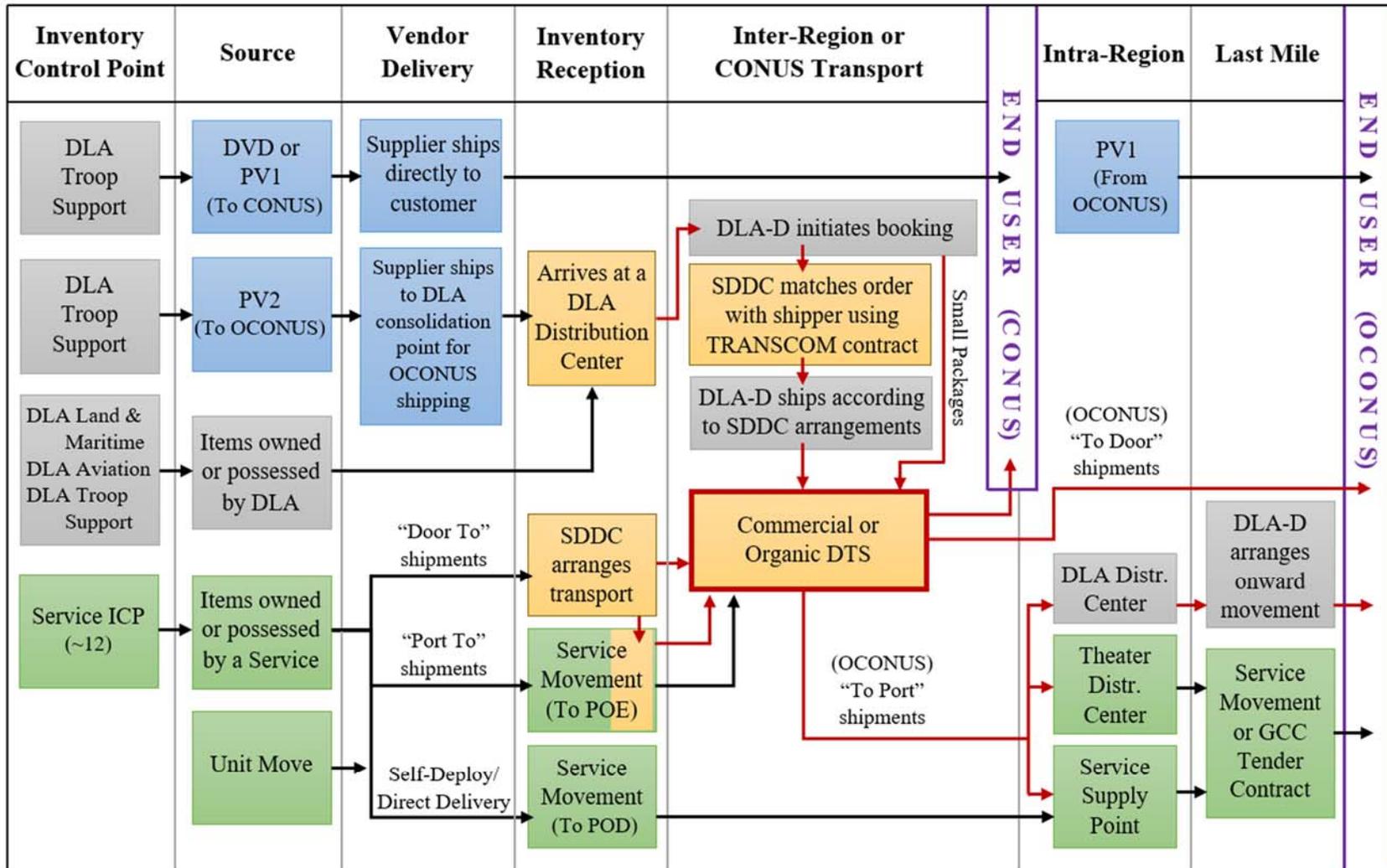


Figure 8. Basic Overview of DOD Distribution



Legend: ■ DVD or PV ■ DLA ■ TRANSCOM ■ Services → In-transit visibility within IGC (a joint DLA & TRANSCOM system)

Abbreviations: DVD – Direct Vendor Delivery; PV1 – Prime Vendor delivery to customer; PV2 – Prime Vendor delivery to DLA; DTS – Defense Transportation System; POE/POD – Port of Embarkation/Debarcation; GCC – Geographic Combatant Command; DLA-D – DLA-Distribution; (O)CONUS – (Outside the) Continental United States.

Figure 9. DOD Distribution Map

B. Readiness and Phase Zero Planning Capabilities

Ideally, all actors involved in distribution—TRANSCOM, DLA, the combatant commands, and the Services—coordinate and collaborate during peacetime or periods between exercises and other activities to maintain their required state of readiness. This “Phase Zero” planning ensures the readiness of U.S. forces.

There are three major types of readiness that TRANSCOM, DLA, and its customers must maintain simultaneously:

- The ability to meet surge requirements for transportation of units worldwide for any major contingency.
- The ability to meet transportation and sustainment requirements for any major contingency.
- The ability to meet transportation and sustainment requirements for peacetime operations.

Table 5, at the end of this section, provides a summary of the challenges associated with each of these various distribution environments, ranging from peacetime to major contingency operations. Note that, across that range, TRANSCOM and DLA play different but complementary roles.

1. Surge

In the event of a major contingency, TRANSCOM’s readiness may be measured by its surge transportation capacity. This is determined not only by the number of aircraft and ships that are available in the first days, weeks, and months of a contingency, but also by the availability of crews to operate those systems, the availability of trained crews and functioning infrastructure at airfields and ports, and the preparedness of other critical capabilities (e.g., customs clearance, overflight rights).

Given the large investments required to obtain and maintain this capacity, DOD periodically conducts major mobility studies to analyze alternatives for achieving the desired level of mobility system performance. The most recent mobility study was conducted in 2016. It led to a finding that the currently programmed strategic airlift fleet, which provides 35.9 million ton-miles per day of capacity, should be maintained.⁸² This capacity was assessed to exceed the needs of the scenarios considered in the study. TRANSCOM periodically reassesses its ability to meet capacity needs, taking into consideration any significant changes, including fleet capabilities, overseas infrastructure, and operational access.

⁸² See the “Mobility Capabilities and Requirements Study: 2016,” conducted by TRANSCOM and the Office of the Secretary of Defense.

In contrast to TRANSCOM, DLA's readiness to respond to demand surges is determined by (1) how accurately it is able to forecast demand in the early phases of a contingency; (2) whether DOD has a sufficient inventory of war reserves and other stocks (which depends in part on decisions made by DLA, its customers, and OSD); and (3) how closely it works with and understands its customers' needs and its supply chain's capabilities. Demand forecasts, once again, are the result of collaboration between DLA and its Service customers that combine analysis of historical usage with analyses of the predicted demands resulting from particular scenarios.

During a major contingency, TRANSCOM has a finite amount of strategic lift capability; consequently, scarce transportation resources must be prioritized and rationed. Not everything or everyone can get to the fight at the same time. However, once they get to the fight, DLA is expected to maintain a sufficient pipeline of supplies so that its military customers never run out of the items they need. Assuming that demand forecasts are accurate and that war reserves were adequately budgeted, the key remaining question for DLA is where in the distribution queue its items should be placed in order to meet operational requirements and priorities. This decision must take into account the capacity limitations of TRANSCOM and the Defense Transportation System. In some cases, DLA—working with TRANSCOM and the Service components in the GCCs—chooses to position some stocks closer to possible areas of operations to reduce the burden on surge transportation capacity.

Both TRANSCOM's and DLA's readiness needs dictate that they be fully integrated into each other's planning processes, and into those of the GCCs and their Service components. This integration promotes a shared understanding of challenges, gives TRANSCOM and DLA an opportunity to prepare for potential surge demand, and enables the joint planning community to incorporate logistics considerations into operational plans. Integrated planning also helps to ensure that surge readiness is maintained during steady-state (Phase Zero) operations, and that fully scaled transportation and distribution systems can be activated at the onset of a contingency operation.

If, as planners expect, future operating environments will be less permissive—if distribution operations are contested—then the aggregate throughput capacity of the Defense Transportation System will likely be degraded. This has far-reaching implications for joint logistics: TRANSCOM's readiness posture may need to be reevaluated, particularly if losses of assets are anticipated or are estimated to be higher than in the past, and DLA's demand forecasting and stock positioning algorithms may call for changes to the amount and location of war reserves, prepositioned materiel, and industrial preparedness.

A specific and growing concern is the impact that threats to cyber security could have on DOD deployment and distribution operations during contingencies. Readiness to meet surge requirements may be affected or compromised by an adversary's ability to disrupt operations, or their ability to gather useful information not only from DOD systems, but from the relatively unprotected information systems of TRANSCOM's and DLA's commercial partners.

2. Sustainment—Contingency

The ability to sustain major operations beyond the initial surge period is a different form of readiness. No newly active theater is “mature” during the first few months of a surge. Operations in Afghanistan and Iraq demonstrate that, *with time*, TRANSCOM, DLA, the GCCs, and the operating forces they support have the ability to turn immature theaters into mature theaters; that is, they are able to establish and modify how TRANSCOM and DLA support commanders to meet the requirements of the operating forces. Although pre-existing theater distribution systems can serve initial needs, extensive collaboration, including trial by fire, is required to build a robust theater distribution system during a major contingency.

Sustaining forces engaged in a major contingency requires TRANSCOM and DLA to adapt their processes and expertise to the situation. In Afghanistan and Iraq, that meant establishing in-theater distribution centers, optimizing how those distribution centers would be supplied, improving demand forecasts, and having the agility to respond when operational realities inevitably diverged from demand forecasts and distribution plans. In the case of Afghanistan, that meant establishing the Northern Distribution Network in anticipation of possible disruptions to supply routes that transited Pakistan. It also meant that at one point TRANSCOM and DLA had to hurriedly develop a new way to supply forward operating bases (FOBs) with precision airdrops of supplies when theater commanders determined that ground convoy operations carried excessive risk. Over time in both Afghanistan and Iraq, the doctrinal distinction between inter- and intra-theater responsibilities became less important; commanders’ operational needs drove adaptation.

To maintain readiness, TRANSCOM, DLA, and their customers in the combatant commands and Services must have the foresight and skills, through planning and exercises, to sustain forces in a future contingency environment characterized by uncertainty and complexity. The required challenges are many. Permissive environments in many cases are becoming largely outdated, and cyber security presents a new set of known and unknown challenges. The reductions in transportation and distribution personnel in the military Services, and in the Army in particular, as well as cuts to distribution capabilities in the GCCs (in their J-4s and in the DDOCs), make planning and executing both surge and sustainment operations more difficult.⁸³

3. Sustainment—Peacetime

The demand for TRANSCOM support during peacetime is far lower than during contingencies. One major challenge this presents is maintaining the readiness of organic (DOD)

⁸³ Both as the Army’s Deputy Chief of Staff for Logistics (G4) and as the current commander as Army Materiel Command, General “Gus” Perna has repeatedly cautioned that the Army has let core logistic capabilities atrophy because of a more than decade-long dependence on contractor support in Iraq and Afghanistan. The generation that cleared the way for the contractors to come in in the first place is too far removed from the experience of soldiers that have only known contractor support. “The skills to plan, synchronize, integrate echelon transportation and commodities in support of the maneuver commander have atrophied.... The bad habits that we’ve created are coming back to bite us now, and we have to fix that.” (“Perna: Army must regain competencies in logistics, contracting,” *Inside the Army*, April 24, 2017). The Army Chief of Staff has made similar statements.

transportation assets while also maintaining the readiness and availability of commercial assets. Airlift and sealift present two distinct sets of challenges.

Air mobility forces—from Air Mobility Command, the Air Force Reserve, and the Air National Guard—maintain readiness by continually conducting training and operational missions to build the skills of aircrew and operational support personnel. These worldwide missions provide crews the opportunity to develop and maintain proficiency in low-level navigation, airdrop, aerial refueling, and routine airlift operations. The need for training is as salient for mobility forces as it is for the Air Force’s combat forces. TRANSCOM moves DOD cargo and passengers on training and operational missions conducted by its mobility forces. TRANSCOM, however, has the challenge of determining how much business it needs to allocate to its commercial partners in peacetime in order to ensure their availability, or even their existence, during a contingency (surge). This is perhaps the central challenge in the management of the CRAF program.

Sealift represents a different management challenge. The VISA program—in which ships are U.S. flagged and made available to TRANSCOM under certain conditions—provides substantial subsidies for every ship, and those ships operate at a much higher operating cost than standard commercial shipping. The existential challenge facing the U.S. flagged shipping fleet is, if anything, a greater challenge for the management of sealift than it is for the management of airlift.

For DLA, the central peacetime challenge remains the same as in other environments: achieving demand forecast accuracy through collaboration with the Services.

4. Planning and Exercises

Readiness—maintaining the ability to deploy forces to and sustain them in a contingency—requires not only investments in equipment and training, but engagement in planning and exercises. The ability to surge and the ability to sustain a conflict require a sufficient number of people with the right skills and training. Planning and preparations for conflict are thus crucial, just as they are for combat forces.

Two examples of Army planning and exercises are Pacific Pathways, in the Pacific, and the deployment of an armored brigade to Poland.

Table 5. DOD Distribution Environments

	<u>Mature Theater</u>	<u>Immature Theater</u>
1. CONUS Peacetime Sustainment	<ul style="list-style-type: none"> • Highly Developed “end-to-end) infrastructure • Extensive Service. TRANSCOM, DLA integration 	N/A
2. (Major) Contingency Surge	N/A	<ul style="list-style-type: none"> • Readiness depends on existing assets and knowhow (due to short time line) • Extensive collaboration required between GCC, Service Components, TRANSCOM, and DLA • Distribution (transport) to whatever the GCC directs
3. (Major) Contingency Sustainment	<ul style="list-style-type: none"> • Extensive collaboration required to build a robust distribution system (e.g., OEF, OIF in early 2000s) • Over time, Distribution (transport) to any end user • Maturity grows; never complete 	<ul style="list-style-type: none"> • Existing distribution systems (e.g., Europe, Korea) provide a foundation to build on • In other instances, there will be little to no existing capability
4. OCONUS Peacetime Sustainment	<ul style="list-style-type: none"> • Well-developed DOD Distribution infrastructure (e.g., Europe) 	<ul style="list-style-type: none"> • GCC, TRANSCOM, DLA collaboration required to improve sustainment capabilities and efficiency (e.g., WALN)
5. OCONUS Exercises and Contingencies	<ul style="list-style-type: none"> • Well-developed DOD Distribution infrastructure (e.g., Europe) 	<ul style="list-style-type: none"> • TRANSCOM (DPO) has an important role in aiding Services and GCCs (e.g., WALN) • Expertise must be maintained

5. Pacific Pathways

Pacific Pathways is a program for continuously doing military exercises throughout the Pacific. It moves brigades by ship between islands and coastal locations. With the typical mission spanning many months, over the duration of U.S. Pacific Command (PACOM) level exercises, the locations for port of embarkation and debarkation could involve multiple countries in the PACOM area of operations. In 2016, Pacific Pathways went to Thailand, Korea, the Philippines, Indonesia, Malaysia, and other locations. (The program collaborates with the U.S. Department of State in obtaining necessary agreements with the host nations.) From a logistics perspective, these exercises are a considerable challenge. For instance, a single military “grey hull” ship could transport a brigade for the full length of the mission—potentially docking for a few weeks at a time before moving onto the next location. Alternatively, one ship could drop the brigade off and a different ship could pick them up, and commercial “white hull” ships could potentially be used for select legs or for transporting specific cargo. The Army’s 8th Theater Sustainment Command (TSC) has responsibility for intra-theater distribution in PACOM. It ultimately makes the decision for the precise transportation arrangements. However, to make that decision, it needs a clear picture

of the viable options and the cost of each. Ideally, TRANSCOM, working with the TSC, constructs analysis and provides alternatives, with the TSC making the final determination of which alternatives best meet operational needs and budgetary and other resource constraints.

6. Poland

In January 2017, the Army deployed the 3rd Armored Brigade Combat Team of the 4th Infantry Division from Fort Carson, Colorado to Poland, as part of Operation Atlantic Resolve. The deployment involved about 3,500 troops, 87 tanks, 144 Bradley Fighting Vehicles, and an additional 2,500 vehicles.⁸⁴ Much of the equipment, vehicles, and supplies for the deployment were shipped to the port of Bremerhaven, Germany. From there, it was the responsibility of the Army's 21st Theater Sustainment Command to orchestrate the movement onto Poland. In preparing for this move, the 21st TSC sought help from TRANSCOM in scouting out rail, barge, and trucking options. The underlying hope was that TRANSCOM could be a one-stop-shop in providing transportation and distribution options all the way to the point of need. However, TRANSCOM had meager analytical capabilities for movement within Europe and was not able to provide the desired assistance. To provide a bit of perspective, as recently as the 1990s, the 21st TSC would have been assisted by theater-level capabilities to manage transportation and materiel, capabilities that have since been entirely cut (specifically, a Theater Movement Control Agency and a Theater Materiel Management Center).

Currently, not only the European Command (EUCOM), but all GCCs, including the Central Command (CENTCOM), no longer have the Theater level Distribution Management Centers and Theater Movement Control Activities. However, in CENTCOM, TRANSCOM did assist with intra-theater movement through the development of the Northern Distribution Network and other movements in the region. A residual experience from this support was a belief among some that it was TRANSCOM's responsibility to support movements within a theater.

C. Information Management

As noted earlier, TRANSCOM and DLA have excellent internal asset visibility, including ITV. What organizational and technical challenges have not permitted until now is a comprehensive, enterprise-wide (DOD-wide) integration of information. The value of having full, "end-to-end" information—from the Services, from commercial providers, and from TRANSCOM and DLA—would be enormous.

Numerous distribution-related information systems throughout the department are under revision or development. These include Enterprise Business System (EBS), Distribution Standard System (DSS), Transportation Management System (TMS), and Global Combat Support System-

⁸⁴ National Public Radio, January 12, 2017, "U.S. Troops Arrive in Poland, but Will Trump Keep Them There?" (<http://www.npr.org/sections/parallels/2017/01/12/509520482/u-s-troops-arrive-in-poland-but-will-trump-keep-them-there>)

Army (GCSS-A). Although past efforts to harmonize architectures across systems have proven difficult, recent advances in information technology, including advances in “Big Data” (the capacity of improved computational techniques to extract patterns from extremely large data sets), leave experts optimistic about the possibilities for achieving better enterprise-wide collaboration and use of data.

D. The DPO, the DEB, and the JDDE

The term “process owner” is often misunderstood in military vocabulary.⁸⁵ Ownership here is not synonymous with execution. The role of the DPO is to assess the entire distribution system (the individual pieces of which are “owned” by various DOD entities), and then to propose and coordinate improvements. This includes identifying weak spots in the system, proposing innovations and changes to distribution processes, facilitating data and technological capabilities for distribution, setting rules and accountability standards, and improving the coordination and synchronization among the many players in the system. The role is designed to cut across the stovepipes of a multi-player distribution system to see the larger picture and improve enterprise-wide performance.

Since 2003, the DPO role has developed and matured. As DPO, the commander of TRANSCOM heads the JDDE governance structure. The current structure, chartered in 2013 by General William M. Fraser III (TRANSCOM commander, 2011–2014) employs “three general/flag officer review forums that meet to vet, analyze, develop, coordinate, decide, and prioritize distribution-related and force projection, sustainment, and redeployment/retrograde operations improvement recommendations and business processes and rules for distribution operations.” This governance structure is oriented toward exercising stewardship of the enterprise, rather than ownership.⁸⁶ According to General John Handy (TRANSCOM commander, 2001–2005), the goal of the DPO designation was to place responsibility with the commander of TRANSCOM to continually seek improvements in effectiveness and efficiency among the Services, TRANSCOM, DLA, and other stakeholders in the distribution process. General Handy stated that as the DPO, the TRANSCOM commander can make informed decisions about the DOD

⁸⁵ The phrase “process owner” is taken from the quality movement of the 1980s and 1990s, and is not meant to convey literal ownership of the system, but rather responsibility for convening and facilitating all relevant members of the organization (stakeholders) to work together in optimizing a particular process. Where consensus cannot be reached—and even where it can—decisions are made by the executive who sits above all the participants. In the case of DOD distribution, that executive is the Secretary or Deputy Secretary. See, for example, Hammer and Hershman (2010, p. 98): “...the role of the process owner...centers on the design of work rather than the traditional management job of supervising people.”

⁸⁶ USTRANSCOM Memorandum, “Charter, Joint Deployment and Distribution Enterprise (JDDE) Governance,” January 29, 2013.

supply chain, even though he or she does not directly control how each organization executes its responsibilities.⁸⁷

Process improvements attributed to the DPO include near-perfect ITV (for items in TRANSCOM or DLA's possession), the pure pallet initiative (consolidating materiel by pallet based on its final destination), stock positioning (to provide more responsive support at greater efficiency to deployed forces), freight consolidation, route optimization, multi-modal transport, the use of third party logistics (3PL) support (e.g., DTCI/DFTS), and cyber security (of data and information associated with the distribution processes).⁸⁸

There is a range of opinions among experienced TRANSCOM officials, both current and former, as to whether the DPO designation has fulfilled its potential. This is to be expected when considering an enterprise as complex as DOD-wide distribution, which must synchronize the efforts of the military Services, TRANSCOM and its components, the DLA, the GCCs, and commercial transportation providers in supporting the global operation of forces. The dynamic nature of worldwide distribution activities, as well as the increasing complexity of the operational environment, indicate a continuing need for the DPO and the JDDE governance structure to integrate the DOD supply and distribution enterprise.

Part of this collaboration takes place through the JDDE governance structure. As noted above, this governance structure is oriented toward enterprise stewardship, rather than ownership. The TRANSCOM commander chairs the DEB, the senior JDDE body that enables major stakeholders to exchange views, collaborate to identify challenges and opportunities, and solve problems.

Unfortunately, the word "owner" gives rise to confusion. The UCP does not give TRANSCOM directive authority over DOD enterprise's distribution system; GCCs determine requirements and the Services determine how they will manage their own distribution and sustainment. The UCP charges TRANSCOM with ensuring that the end-to-end distribution system function is evolving in an optimal fashion.⁸⁹ It is a "facilitator" and "coordinator" role, based on the premise that only TRANSCOM has visibility into the entire, enterprise-wide distribution system.

⁸⁷ General John Handy (RET), interview with authors, October 19, 2016.

⁸⁸ Memo, General Duncan J. McNabb, Commander, USTRANSCOM, December 17, 2008: Distribution Process Owner (DPO) Intent. "The most recent milestone of transporting over 10,000 Mine Resistant Ambush Protected vehicles highlights what teamwork can accomplish. Likewise, the DPO has achieved remarkable improvements in efficiency, saving over \$2B in distribution and related logistics cost through applying fixes across the enterprise." "Now more than ever, we need an integrator--the original intent of the DPO--to reduce barriers that hinder us from working as one team...The DPO is uniquely situated to garner the unity of effort necessary to achieve these goals."

⁸⁹ See footnote 87 for a discussion on the phrase "process owner."

Table 6. Cost Avoidance Summary for DPO Strategic Opportunities

<u>Type</u>	<u>Initiative Description</u>	<u>Avoidance (\$M)</u>
Aircraft Fuel Costs	Avoid buying fuel at high cost locations by having aircrafts carry extra fuel for follow-on legs	\$399
Aircraft Cargo Utilization	Better pallet utilization, both by weight and cube	\$388
CENTCOM Airlift Capacity	Better use of cargo space on (already) scheduled grey tails; improved hub-and-spoke model for air cargo; system for trucking cargo to cheaper airlift	\$310
Surface Container Utilization	Switch from 20' to 40' cargo containers; cargo consolidation for multiple destinations	\$277
Forward Positioning	DLA initiative to lower transportation costs: ship by ocean and hold instead of by last minute air	\$140
First Destination Transportation Costs	Supplier shipments to DLA depots changed from FOB-Destination to FOB-Origin using DTCL trucks	\$43
Contingency Airlift Efficiency	Redeployment missions/exercises combined where possible	\$18
Total		\$1,576

Note: Cost avoidances include initiatives with effective dates ranging from 2009 to 2016.

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5. TRANSCOM and DLA Business Practices

A. Shared Business Practices

The “business” of TRANSCOM is to provide transportation for the deployment and sustainment of units. It does this through a combination of organic (military owned) and commercial transportation assets and services. DLA’s business is to manage most classes of supply, including food, fuel, medical supplies, construction materials, and consumable spare parts.⁹⁰ The essence of DLA’s business is to forecast demand for every item, and then to ensure that the demand for those items can be met in a timely manner. The business connections between the two are few, but important.

1. Defense Transportation System (DTS)

The most significant business connection between TRANSCOM and DLA is DLA’s use of the DTS, which includes both the organic military and the private commercial arms of the transportation apparatus for which TRANSCOM orchestrates and contracts. DLA uses DTS to move items from either a supplier or a DLA warehouse to its customers in the continental U.S. and throughout the world. In dollar terms, DLA’s use of DTS amounted to \$693 million in FY2016 (see Table 7), equivalent to 2.2 percent of DLA’s total revenue for that year of \$32 billion. The year before that (FY2015), DLA’s larger expenditure on DTS of \$786 million equated to 6 percent of DOD’s \$11.9 billion in O&M transportation expenditures (see Table 2) and 9.7 percent of TRANSCOM’s \$8.1 billion in expenditures. Separating out expenditures for moving fuel or other energy-related products (tanker ship charters and DLA Energy in Table 7), DLA’s non-Energy DTS costs were only \$290 million in FY2016, or 1.3 percent of DLA’s non-Energy revenues of \$22 billion.

The financial intersect between TRANSCOM and DLA is small relative to the size of each organization, and to DOD transportation expenses at large. In addition, two-thirds of DLA’s DTS expenditures of \$700M (\$450–\$500M) do not touch TRANSCOM directly, but represent direct payments from DLA to commercial vendors operating under TRANSCOM-managed contracts (DTCI, CONUS tenders, etc.). In this regard, TRANSCOM is the transportation enabler rather than the transportation provider. It holds the contracts but does not move the goods itself.

As discussed in chapter 2, not everything flows through DTS—in particular, most food and medical supplies are not stored by DLA and each has its own, distinct distribution channel managed by the private sector contractors used by DLA. Fuel also has its own, unique distribution process, which rests primarily on private sector distribution systems.

⁹⁰ In spare parts, DLA manages consumables, not depot-level repairables (DLRs) and other non-consumables.

Table 7. DLA’s use of DTS (in millions of dollars)

	FY13	FY14	FY15	FY16
Tanker Ship Charters ^a	200.5	182.1	266.0	228.0
Premium International Air Service ^b	107.1	98.5	77.0	56.4
CONUS to OCONUS	37.1	50.1	56.9	45.0
OCONUS to CONUS	5.5	3.7	2.8	2.5
OCONUS to OCONUS	64.6	44.7	17.3	8.9
Domestic Freight Shipments ^b	310.2	409.4	443.4	408.9
DLA Energy	152.2	178.2	189.4	174.9
All other DLA	158.0	231.2	254.0	234.0
Total	617.8	690.0	786.4	692.9

Notes: Dollar amounts have not been adjusted for inflation. Numbers may not add due to rounding.

^a From the TWCF President's Budgets ("Actual" column, DLA payments to MSC).

^b From the DOD Third Party Payment System (these purchases do not go through the TWCF but are direct payments from users to vendors under TRANSCOM managed contracts or tenders).

Beyond DTS—that is to say, beyond DLA’s reliance on DTS for the transportation of some of the items it supplies to its customers—there is little overlap in “business” transactions between TRANSCOM and DLA. DLA has no role in the organization and management of airlift operations, air and sea bridges, or the deployment of units, not to mention Presidential and VIP movement and patient movement. For its part, TRANSCOM has no role in the item management process behind the planning, purchase and storage of food, medical supplies, fuel construction material, consumable spare parts, and the other classes of supply managed by DLA.

2. In-Transit Visibility

One important area where the two organizations do work closely together is ITV. Their joint system, IGC, combines data from more than 100 distinct data sources within TRANSCOM, DLA, and other entities to give TRANSCOM and DLA near-perfect visibility over materiel that is held in either TRANSCOM or DLA possession. With rare exception, TRANSCOM and DLA know where every container (or pallet) is, and they know what is in every container. DLA can also identify which container an item is in, and from there find the location of the container.

Like their commercial counterparts, TRANSCOM and DLA have taken advantage of technological advances and now have near-perfect ITV. The contribution of ITV to efficient operations is just as important to TRANSCOM and DLA as it is to commercial firms.

It is widely believed—though difficult to validate quantitatively—that asset visibility has made an enormous contribution to the reduction of the “iron mountain” in defense logistics. During Operations Desert Storm and Desert Shield (1990–1991), for example, TRANSCOM was able to move enormous amounts of materiel in a very successful transportation and distribution operation. At the same time, however, a substantial amount of materiel was “lost” (though often not

permanently) because no one knew exactly where it was in the “mountains” of containers stored in the desert. In Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF) during the 2000s, logisticians and operators had a far better handle on where things were. Thus, there was less of a need to order or ship duplicate or extra supplies, “just in case.” More generally, supplies moved more expeditiously to the final customers, and customers had more confidence that their supply chains were working. (This success is also widely believed to pertain to current peacetime operations.)

A larger or different war may require a larger amount of materiel. So although one cannot draw a direct quantitative comparison between Kuwait/Iraq in 1990 and Afghanistan/Iraq 12-15 years later, it is widely accepted that asset visibility has improved considerably, and that this resulted in more efficient and effective logistics and sustainment support to the operating forces, at a lower cost and with a “smaller iron mountain.”

Once a container, pallet, or item has been delivered to a customer, it leaves the TRANSCOM-DLA system. Neither IGC nor any of TRANSCOM’s or DLA’s databases has consistent visibility into materiel once the customer takes possession of it. This highlights the challenge of achieving the logisticians’ dream of “end-to-end distribution visibility.” Each of the Services is developing its own information systems (e.g., DCSS-Army) that must meet a complex array of requirements, in which ITV is just one small piece. By what means do the individual Services maintain visibility of their materiel? Are they able to share that information with TRANSCOM and DLA to create enterprise-wide ITV? So far, the answers to these two questions, and the path to achieving these goals, are not clear.

The commander of TRANSCOM, in his role as the DPO, is aware of this problem and correctly considers it a challenge he must take the lead in addressing. The information that could come from such an end-to-end system would be invaluable to DLA in improving its demand forecasts, which is why DLA is a key partner with TRANSCOM in exploring how information might be harvested and exploited on an enterprise-wide basis.

3. Stock Positioning

The transportation cost of moving cargo by sea is nearly always less expensive than moving it by air. If demand forecasts are accurate—in terms of both quantity and timing—supplies can be moved more efficiently by sea and arrive as they are needed. This is common in commercial supply chain management. An exception to this rule in the commercial world is products that are small, light, and have a high market value. For instance, mobile phones are typically shipped by air to avoid maintaining large amounts of expensive inventory, and to get the products to market quickly.

One area of collaboration between DLA and TRANSCOM in recent years has been to optimize the placement of sustainment items around the world. How much of which items should be purchased in advance and placed in a strategically located warehouse or distribution center, in anticipation of possible demand? If too little is positioned forward, urgently needed items may

need to be airlifted in at great expense. If too much is positioned forward—having arrived far less expensively by surface shipping—the costs of carrying that inventory, and potentially having it go to waste, may eventually result in higher costs. In both cases, considering the impact on operational effectiveness is paramount.

Stock positioning is an effort to optimize sustainment costs by balancing shipping and warehousing costs with the risk of too little or too much demand. DLA works with the GCCs and Service components to calculate a reasonable demand forecast. They then all work with TRANSCOM to analyze the different transportation and storage options and costs.

One example of a stock positioning initiative is in Africa, where DLA, working with United States Africa Command (AFRICOM), United States Special Operations Command (SOCOM), and TRANSCOM has established a new distribution center in Accra, Ghana.

The West African Logistics Network (WALN) is a pertinent example of the interplay and collaboration of TRANSCOM, DLA, and the theater in designing a distribution system, in this case from the ground up. In recent years, the AFRICOM and SOCOM have had an increasing presence in West Africa, including exercises, humanitarian assistance (such as Operation United Assistance, the 2014 Ebola relief effort), and efforts to counter Boko Haram and ISIS-West Africa. However, the distribution of DOD assets and supplies in West Africa has been conducted on a somewhat ad hoc basis. Although there is a channel mission into Niamey, Niger, cargo movement into and within West Africa is frequently dependent on contingency or Special Assignment Airlift Missions (SAAM) that happen to be flying in the area. Cargo piggybacks on these flights on a case-by-case basis. When no such flights are available, planes (frequently C-130s flying from Ramstein Air Base, Germany) are chartered to fly cargo down at a price of \$350,000 to \$450,000. This transportation cost often far exceeds the value of the cargo itself.

From DLA's perspective, the objective is to buy water and other low-cost, heavy items that are costly to transport as close to the end-user as possible. If DLA does not or cannot procure those items, TRANSCOM will fly them in (at a higher cost to the enterprise) to meet the theater's requirement. In the interest of its customers, DLA feels pressure to procure things locally. Even for items that are not procured locally, with greater forethought they can be positioned ahead of the immediate demand. For instance, everything, including operational rations (food), is currently flown in for exercises. But since exercises occur with some degree of regularity, sending supplies in by ship ahead of time would reduce the bill considerably. Whether procured locally, shipped, or flown, DLA may find it expedient to establish a distribution center, where items can be stored prior to their sale and distribution to Service customers.

The irregular nature of the current shipping pattern in West Africa has led to inconsistent ITV. Another byproduct of the current arrangement is that while AFRICOM has the prerogative to establish transportation directions within its area of responsibility, absent clear guidance, SOCOM has been purchasing its own transportation and distribution requirements within AFRICOM's area of responsibility. This resulted in some inefficiencies, such as AFRICOM and

SOCOM unwittingly competing against each other for scarce local transportation assets. TRANSCOM and DLA thus began working on WALN at the request of both AFRICOM and SOCOM.

The vision for WALN is to have a network, fed by a central hub, which could then service a set of primary locations on at least a weekly basis. It would also service a set of secondary locations every other week. The entire coverage area extending from there is comparable to the size of the continental United States. AFRICOM has been working through diplomatic channels to establish the hub in Accra, Ghana, which would allow both air and sea access. The channel mission from Ramstein, Germany would go to Accra, but it would also maintain frequent stops in its current destination of Niamey. Much of the network involves low-volume, low-frequency destinations—a persistent challenge for scoping routes and forecasting demand.

As part of the design, TRANSCOM conducted its first-ever business case analysis of a distribution network, comparing the cost and level of service of the existing ad hoc transportation system to that of the potential network. With scant records on cargo movement within West Africa, approximating the volume requirements for each location proved to be a substantial hurdle. Poor infrastructure was another. WALN will utilize trucks and rail where it can, but with dirt roads that wash out, some areas can only be reached by helicopter. Distribution within WALN will largely be through contracted delivery; solicitations for service are currently underway.

One of the final obstacles was funding. TRANSCOM identified that it was able to provide initial financing for WALN through the TWCF, but only if there was a single bill-payer that could pay it back. AFRICOM has appointed U.S. Air Forces Africa as the bill-payer. WALN is currently scheduled to begin operating in FY 2018. Although the network has the potential for enterprise cost savings over time, a primary impetus for establishing WALN has been the increased readiness capacity that comes with a regularly established distribution network. TRANSCOM envisions that it can apply its experience with WALN to designing similar networks in other locations, perhaps in East Africa or South America.

4. Cyber

Like every DOD organization, TRANSCOM and DLA have focused more attention on cyber security issues in recent years. Both organizations are reliant on commercial partners to provide goods and services to their DOD customers—which poses some unique security challenges, since transportation and supply information must necessarily flow through potentially less-secure commercial networks. Consequently, TRANSCOM and DLA are working closely with one another to understand and address their mutual challenges.

B. Comparison to Private Sector Practices

The common refrain that “government should operate like a business” is meant to emphasize the importance of ensuring that government operations are managed as efficiently as possible.

Although government operations rarely have the advantage of the discipline imposed by competition (which, combined with the profit motive, is what gives companies in market economies the incentive to be as efficient as possible), the government should and often does adopt best practices from the private sector—when those practices are consistent with the mission of the government. Particularly with regard to military operations, it is imperative that efficiency not be considered without also considering effectiveness.

The argument is sometimes made that TRANSCOM and DLA should conduct their business more like the private sector to become more efficient. It is also argued by some that TRANSCOM and DLA should be combined so that “distribution” is under one hat, as is often the case in the private sector.⁹¹ In this section, we consider whether TRANSCOM and DLA exhibit cost consciousness and business practices comparable to the private sector.

1. Costs and Incentives

Even in the private sector, cost-consciousness and efficiency are not always linked directly to profit and loss, or to competition. It is common for corporations to have activities or entities that incur costs, but for which there is no independent profit and loss calculation. Many staff functions—e.g., legal, HR, and finance—fall into this category.

Take, for example, a purchasing department in a large company. The company’s calculations of profit and cost may provide no insight into how efficiently and effectively the purchasing department conducts its work. Determining whether that specific department or activity has too many or too few people, or if its IT costs could be reduced, has to be done based on a detailed analysis of that particular activity. Senior executives must ensure that lower-level executives or managers face the right incentives to induce them to be cost conscious. One way to do that is by adopting the right metrics—measuring costs and outputs, challenging managers to be cost-conscious while still meeting other performance goals, and then using those metrics in evaluating performance.

This model is most obviously applicable to the management and oversight of DLA. Successive DLA directors have been under strong pressure from OSD leadership and the Services (their paying customers) to reduce costs while meeting performance requirements. DLA famously has hundreds of metrics against which its cost and other performance parameters are measured.⁹² Some of these—for example, different cost recovery rates and various measures of backorders—

⁹¹ See for example the written statement of former Deputy Secretary of Defense John Hamre, accompanying testimony before the Senate Armed Services Committee, November 10, 2015: “A second area where I think we need to update our structure reflects the revolution in industry that we have neglected in the Defense Department. For example, 50 years ago, American corporations had separate warehouse departments and transportation departments. Now every successful corporation has combined these two functions. Yet we in DOD have stand-alone organizations that do transportation and depot warehousing.”

⁹² See for example, “Materiel Distribution Improvement Plan,” Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness, September 2016.

are more salient than others. But together they are used by DLA and OSD leadership to evaluate the performance of the agency and its leadership.

2. DLA Business Practices

DLA is engaged in a large number of businesses, not a single business. Food, fuel, clothing, medical supplies, construction materials, spare parts, and so on are all unique businesses or markets. In each market, there are common industry practices; these practices vary by and within industries, and not every firm runs its business the same as every other firm. For the commercial goods most like those managed in the private sector, DOD already enters combined contracts for supply and delivery—both mirroring private sector practices and combining procurement and distribution.

In the case of food, for example (Class I), DLA has in place a “Prime Vendor” program. This means that it has contracts in place with food vendors, and then individual customers (e.g., the mess hall at an Army or Air Force base) order what they need from that vendor on that contract. The vendor then directly delivers the items to the customer. In the private sector, institutional customers, such as hotels, fast food franchisees, schools, and other large institutions, order their supplies in exactly the same fashion.⁹³

In the case of medical supplies (Class VIII), DLA has in place a DVD program that is identical to industry practice. DLA puts in place the master contracts, and then hospitals and other medical service providers order directly from the vendor. As in much of the health care sector of the economy, a large part of the process is highly automated: when an item is pulled from a hospital pharmacy or dispensary, that transaction is recorded electronically, and resupplies are ordered and delivered automatically.

In the case of fuel (Class III), DLA manages a highly competitive auction process in which refineries bid to supply specific types of fuel and other products to specific locations (Defense Fuel Supply Points, or DFSPs). This process is widely regarded as both efficient and effective in obtaining the lowest possible prices for DOD, while getting the products it needs where it needs them.⁹⁴ DLA’s ability to provide assured and uninterrupted supplies of fuel anywhere in the world to forces operating under all conditions has no commercial counterpart.

Similarly, clothing and equipment (Class II) and construction materials (Class IV) are procured according to standard industry practices, with modifications as needed for unique military requirements—e.g., clothing is required by law to be manufactured in the United States.

Consumable repair or spare parts (Class IX) represent a hybrid approach that reflects the “90-10” challenge facing DLA and its customers, primarily in the Service maintenance depots. For 90

⁹³ Unlike fresh food supplies, MREs, rations, and other items may be stored in DLA warehouses as war reserves or operational stocks.

⁹⁴ See for example, Business Executives for National Security, “Finding Efficiencies In the Business of Defense: Reducing Fuel Cost for the Defense Logistics Agency,” February 2013.

percent of its orders, DLA supplies its depot and other customers with little fanfare—just as airline maintenance facilities, for example, receive spare parts from their suppliers. These orders tend to be for high-volume items or other items that are relatively easy to forecast. The remaining 10 percent are items for which demand forecasts are more difficult, despite the best efforts of DLA and its customers working together to analyze past data and future depot maintenance plans. The simplest example of this is the demand for spare parts that results from having old weapon systems still in the inventory. Both planned and routine maintenance can result in surprises on the depot production line that can take time to react to (due to lengthy procurement cycles, etc.). This is a problem that has no clear counterpart in the commercial sector, where aircraft models are mass-produced in higher volumes, with the planes being retired at the end of their “normal” life.⁹⁵

In summary, DLA conducts a number of businesses, each of which follows standard industry practices where possible, given the unique requirements presented by DLA’s military customers, or by U.S. government regulations.

3. TRANSCOM Business Practices

Drawing comparisons between how TRANSCOM conducts its business and how the private sector conducts similar businesses is more complicated than in the case of DLA. This is because of the readiness requirements placed on TRANSCOM and its components. TRANSCOM must ensure and maintain transportation and distribution capacity that will meet wartime requirements. In other words, its projected wartime capacity requires assets and capabilities that are far in excess of its peacetime needs. It must also be able to surge quickly.⁹⁶

The closest civilian comparison to military surge requirements is the expansion of business experienced by logistics and distribution firms every Christmas season. FedEx has a non-peak average of 12 million parcels per day that surges to more than 25 million per day in the Christmas rush.⁹⁷ UPS similarly surges from 18 million packages per day to more than 30 million.⁹⁸ These commercial surges have little bearing on DOD’s surge challenges.

First, firms do not need to maintain excess capacity all year;⁹⁹ rather, they hire seasonal workers, employ more overtime to absorb the bulk of the increase, and contract for additional

⁹⁵ For more detail, see Richanbach, et al. (2014).

⁹⁶ See, for example, the “Mobility Capabilities and Requirements Study: 2016,” conducted by TRANSCOM and the Office of the Secretary of Defense.

⁹⁷ See “FedEx Anticipates another Record Peak Holiday Shipping Season,” November 1, 2016, FedEx Newsroom (<http://about.van.fedex.com/newsroom/global-english/fedex-anticipates-another-record-peak-holiday-shipping-season/>).

⁹⁸ See “UPS Forecasts Record-Breaking Holiday Shipments,” October 27, 2016, UPS Pressroom (<https://pressroom.ups.com/pressroom/ContentDetailsViewer.page?ConceptType=PressReleases&id=1477506556294-677>).

⁹⁹ Although, for instance, in 2016 UPS opened “15 new or expanded facilities across the U.S.” in preparation for the Christmas season (ibid). Similarly, Amazon recently began purchasing its own cargo planes to support shipping

capacity. Second, the surge in demand may be forecast with reasonable accuracy based on historical and projected sales data. Third, a loss of sales due to inadequate surge capacity does not have the same consequences as the inability to move military units and their sustainment in the event of a national military emergency.

A different kind of surge or “peak load” challenge is experienced by electric utilities. They must have enough capacity to meet peak electricity demand during hot summer days, although that capacity is in excess of normal demand for the rest of the year. In this case, it traditionally falls to regulators to determine the level of capital investment required of the utility, and consequently how much extra cost to incur and how much risk to take. In this sense—the tradeoff between risk and cost—there is a parallel to the decisions made by DOD and Congress regarding investment in readiness capacity.

a. Airlift

As noted in Chapter II, TRANSCOM contracts in peacetime with commercial air carriers to transport large numbers of personnel and cargo. Organic assets are used to transport most outsize and oversize cargo and other special requirements. In addition, because of the requirement to maintain the training of air crews, ground crews, and other parts of the military transportation infrastructure (e.g., airfield operations), organic assets fly far more than “needed” on the basis of peacetime demand alone. Efficiency dictates, consequently, that rather than fly empty, these flights carry cargo whenever possible. TRANSCOM and the Air Mobility Command (AMC) have established “Channel Missions” which operate as regularly scheduled routes, in order to make this process as efficient as possible.

One of the many complications of this arrangement, however, is how to maintain a reasonable amount of business for TRANSCOM’s commercial (contract) carriers. TRANSCOM augments its own air fleet with the CRAF. Commercial airlines “contractually pledge aircraft” to CRAF that can be “activated when needed.” In return, to entice airlines to participate in the program, “the government makes peacetime DOD airlift business available to civilian airlines that offer aircraft to the CRAF.”¹⁰⁰ TRANSCOM is then responsible for determining how to allocate business to these airlines during peacetime to ensure that the DOD can rely on the added aircraft capacity during wartime. There is no immediate commercial counterpart to this dilemma.¹⁰¹

capacity during peak seasons, as well as increased flexibility at other times (“This is Amazon’s first ‘Prime Air’ plane,” August 5, 2016, <https://www.recode.net/2016/8/5/12382052/amazon-prime-air-plane>).

¹⁰⁰ See “Civil Reserve Air Fleet,” July 28, 2014, US Air Force (<http://www.af.mil/About-Us/Fact-Sheets/Display/Article/104583/civil-reserve-air-fleet/>).

¹⁰¹ In fact, technological and market changes in the airline industry—including sophisticated information systems for scheduling and ticketing, and mergers which have resulted in more oligopolistic behavior—are important factors in the decline of the commercial charter business over the past three decades.

b. Sealift

TRANSCOM contracts with commercial shippers to move cargo from the United States to numerous overseas destinations. The most common arrangement is to have a single shipper take responsibility for the door-to-door delivery of cargo, using two or more modes of transport. For example, the shipper is responsible for picking up the cargo (typically a container) and delivering it by truck and/or rail to a port, where it is put on a ship and delivered to an overseas port, where it is picked up and delivered by rail and/or truck to its final destination. Rather than write separate contracts for each mode or leg of the trip, TRANSCOM typically uses one contract and the contractor arranges for the different modes of delivery. This “multi-modal” approach is standard industry practice.

Statutory and legal factors in some cases restrict TRANSCOM’s ability to follow cost-efficient industry practices. The legal requirement that cargo be sent on U.S.-flagged carriers is one such case. To accomplish this goal, maritime shipping firms place specific ships into the Voluntary Intermodal Sealift Agreement (VISA) program. These ships are required to have U.S. crews, and are dedicated to carrying cargo under contract for TRANSCOM. Other restrictions also apply; for example, a VISA ship carrying U.S. military cargo may not stop in certain countries en route to its destination for TRANSCOM. The carriers receive an annual subsidy for each ship in the program, to offset the added costs of adhering to the restrictions imposed by the TRANSCOM contracts. Again, the unique characteristics of the military market make direct comparisons to commercial practices difficult.

c. Surface (Land) Transport

TRANSCOM primarily uses commercial shippers for delivery from and to destinations within CONUS. Most of this activity is conducted within the DTS program. (See the discussion above, as well as the next subsection on DTCI/DFTS.)

4. Defense Transportation Coordination Initiative/Defense Freight Transportation Services

In August 2007, TRANSCOM entered into a third-party logistics contract known as the DTCI. This contract was an attempt to smooth out volatile prices, reduce the use of tenders, and consolidate freight and shipping arrangements across the DOD enterprise. It was also TRANSCOM’s—and largely, the U.S. Federal Government’s—first foray into the world of third-party logistics.

DTCI was designed for high-volume, repetitive shipments between fixed locations in CONUS. Its initial limited rollout proved to be proficient, so much so that the Services, and the Army in particular, wanted to use it for everything—including low volume, irregular shipments, between non-stationary locations. The result was that an otherwise successful contract began to buckle under demands extending beyond its competitive advantage. Moreover, by using the contract, the Services had to pay large management fees, even for low-volume use. The Services

were further dissatisfied that the DTCI costs were not folded into the working capital fund rates, but came as a separate bill and required payment from a different pot of money. In the end, the Services preferred to use tenders, and the Services were officially removed from the contract in October 2014.¹⁰²

DLA on the other hand thrived under DTCI with its high-volume shipments between depots and warehouses. DLA embraced the contract and aligned its business practices around it.

On-time delivery over the initial years of DTCI was volatile, likely due to the expanding demands placed on the contract, as well as the standard set of growing pains that can be expected to accompany the start of a major contract. Since 2011, however, on-time delivery has consistently hovered between 97 percent and 99 percent (see Figure 10).¹⁰³ The magnitude of the DTCI contract peaked in the first part of 2010 with a bill of \$126 million. But four years later, it was down to just \$38 million (see Figure 11). The drop from 2010 to 2014 can largely be attributed to a variety of services being pulled out of the contract, rather than changes in Iraq and Afghanistan.¹⁰⁴

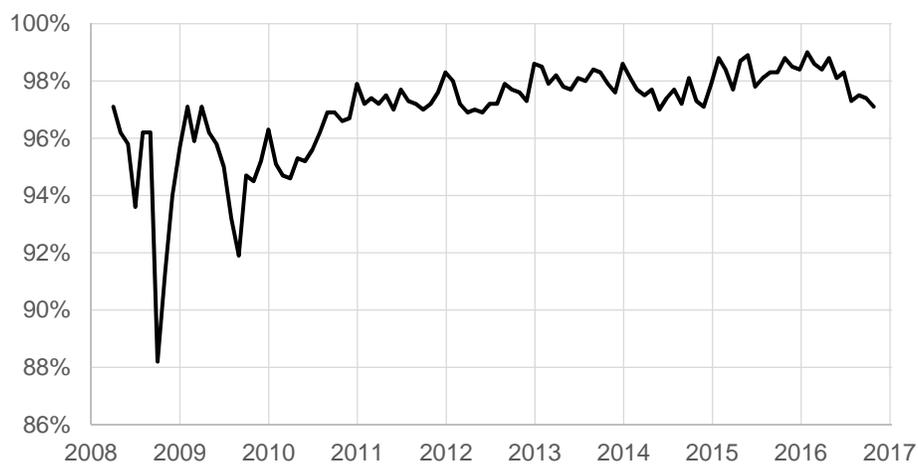
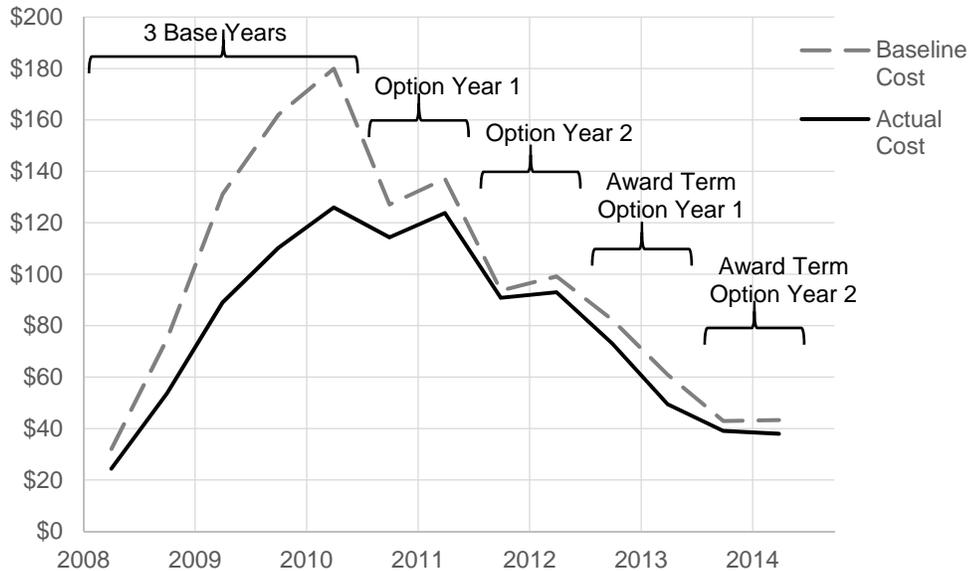


Figure 10. DTCI On-Time Delivery Performance

¹⁰² Per-shipment fees were studied later as an alternative to management fees, but by that point, the Services had already wanted to get out. An important point here is that the Services pay per shipment fees from a different pot of money than they do for management fees. Even if the two methods have the same monetary cost, budgetary restrictions hinder the movement of funds across categories.

¹⁰³ On-time delivery performance data prior to DTCI is unfortunately no longer available (plus the previous contract, the Tailored Transportation Contract, focused on specific traffic lanes rather than on the enterprise picture). That said, there is some perceived sense that DTCI improved on-time delivery relative to the previous arrangements.

¹⁰⁴ For instance, air, specialized, and flatbed equipment types were removed from the contract. The existing DTCI contract is down to less than load shipments and van shipments. Transportation for all the different equipment types is being put back into the Defense Freight Transportation Service contract, which will replace DTCI.



Notes: Baseline costs were updated for each of the four option years and reflect “Not-to-Exceed-Rates.” Actual costs are based on shipping invoices (but do not include management service or award fees). Dollar amounts have not been adjusted for inflation.

Figure 11. DTCI Actual and Baseline Costs (in millions of dollars)

After nearly a decade of experience, TRANSCOM has channeled numerous lessons learned into a substantially revised third-party logistics contract. The new version, DFTS, differs from DTCI in several ways. Perhaps most prominently is that there will be no separate management fee. All fees will instead be rolled directly into the shipping rates. Another significant difference is that under the DTCI contract, all eligible freight must be shipped by the contract carrier. DFTS does not have that requirement—providing some freedom to shop around, but at a cost. Rates tend to be lower when a contract holder is guaranteed a certain amount of business. The DFTS contract is currently written for only DLA and the Defense Contract Management Agency (which does a lot of first destination transportation purchases), but it does include options for the Services to join. (For instance, it may be beneficial to add high-throughput locations, such as Fort Bragg or Fort Hood). Other government agencies, such as the General Services Administration, may also participate in the future. Pending the resolution of contract award protests, DFTS will begin in late 2017.

5. Business IT

DLA manages its business with an enterprise resource planning (ERP) system. EBS is a SAP-based system that ties together demand planning, ordering, inventory management, billing, and financial management. This is the same kind of “backbone” on which many private sector firms run their businesses. EBS is widely regarded as a successful ERP implementation (one of the few in DOD’s experience). Among other things, it helped DLA to develop and enforce an enterprise-wide set of standard operating procedures.

TRANSCOM, on the other hand, is planning and executing military operations. Some aspects of these operations—e.g., channel missions—are similar to commercial transportation operations, but still need to be planned and executed as part of an integrated set of military operations. This latter includes air, sea, surface, and aeromedical operations in support of deployed forces, as well as in support of Presidential movement and other unique responsibilities. Thus, TRANSCOM employs a TMS in lieu of an ERP. Although it needs to contract and pay for the commercial assets it employs, and it needs to bill its customers, its underlying business—military operations—is quite distinct from DLA.

6. Resource Authority

The organization of DLA resembles that of a private sector company far more than TRANSCOM, or for that matter many other DOD organizations. The most important feature to note is that every part of the DLA organization is under the full and complete control of the director of DLA. This includes, most importantly, the buying commands in Richmond (Aviation), Columbus (Land and Maritime), and Philadelphia (Troop Support); and DLA Energy, DLA Distribution, and DLA Disposition. This is unlike TRANSCOM, where the main operating units are subordinate commands that actually belong to their parent Service—AMC (Air Force), MSC (Navy), and SDDC (Army).

Consequently, while the director of DLA exercises complete authority over the size and composition of his workforce and the capabilities of his subordinate organizations, the commander of TRANSCOM must negotiate with others if changes are being considered to the resources and capabilities of “his” organizations. The commander of the Air Mobility Command, and the chief of staff and secretary of the Air Force exercise authority over AMC resources; the commander of MSC and the chief of Naval Operations and secretary of the Navy exercise authority over the commander of MSC; and the commander of the Army Materiel Command and the chief of staff and secretary of the Army have significant influence over SDDC resources.

7. Conclusion

The suggestion that DOD adopt “the” industry way of organizing logistics is too often based on a pair of contra-factual assumptions. The first is that DOD has not already adopted best business practices being used in the private sector. DLA and TRANSCOM, in fact, employ many business practices that are similar or identical to those used by the private sector.

The second contra-factual assumption is that there exists a single or standard industry way of organizing and managing supply and distribution functions. There is in fact no such thing as “the way it is done in the private sector.” Walmart has a very successful business model. So do Amazon, Safeway, American Airlines, Apple, and Caterpillar. But their purchasing and distribution systems, including warehousing and transportation, are far from identical. In fact, the multi-billion dollar

Third Party Logistics (3PL) industry exists precisely to provide distribution and warehousing services tailored to companies' individual needs and preferences.¹⁰⁵

C. Consolidation Considerations

Consolidations or mergers are, of course, common in the private sector. There are three types of advantages that firms seek when considering a combination of some kind. First, in buying or merging with another company, firms may be purchasing a set of products, technologies, or capabilities. It is often less expensive and less risky to purchase them than to make large investments and attempt to create them internally. Second, firms seek to purchase or merge with competitors to increase their market share. This eventually allows them to charge higher prices, and receive higher profits, because of their oligopoly or monopoly position. Neither of these factors are particularly relevant for the DOD (in terms of a justification for combining, consolidating, or merging TRANSCOM and DLA in some way or another).

A third reason firms seek is to consolidate to take advantage of economies of scale with respect to fixed costs; this allows them to conduct more business on top of a smaller average fixed cost. The classic case of economies of scale is that of a natural monopoly, such as an electric utility. It is less costly for one firm to erect poles and cables in a city than it is for two firms to duplicate that fixed cost. The low marginal cost of providing electricity can then be combined with much lower average fixed costs.¹⁰⁶

With respect to economies of scale, DLA represents a highly successful strategy begun more than five decades ago. Although not quite a natural monopoly, the elimination of duplicative fixed costs in DOD supply operations (inventory management, storage and distribution, contracting, single business operating system, etc.) has been a success. The consolidation resulted in improved effectiveness and efficiency by eliminating overlapping fixed costs and allowing for enterprise-wide optimization, versus Service/component-specific sub-optimization. As discussed in chapter 3, as supply responsibilities have shifted from the Services to DLA, the number of people has been reduced from well over 60,000 to about 26,000.

In the 2005 BRAC, DLA was given new responsibilities for retail management of the supply, storage, and distribution of Class IX spares at the Service maintenance depots. This may be seen

¹⁰⁵ The sustained growth of the 3PL industry in recent decades—expanding in the U.S. from a \$31B industry in 1996 to a \$161B industry in 2015—is a testament to its success in providing tailored distribution solutions. (See, for example, the Armstrong & Associates, Inc. reports at <http://www.3plogistics.com/trending-up-3pl-market-predictions-for-2014-and-2013-results/> and <http://www.3plogistics.com/tightened-up-third-party-logistics-market-results-and-trends-for-2016/>)

¹⁰⁶ Size alone is not an argument for a merger or consolidation if it does not convey one of the advantages cited here. Thus the simplistic argument that “Organizations A and B are both large, so combining them must provide some savings,” has little merit. As a general rule, mergers in the commercial sphere tend to be overly optimistic to the point that successful mergers (by a variety of criteria) are the exception. The management literature continues to search for the key ingredients that actually make mergers work. See, for instance, Christensen, et al. (2011).

as a continuation of the decades-long strategy of consolidating activities in DLA to take advantage of its economies of scale and reduce duplicative fixed costs in the Services. At the same time (2005), the decision was made to retain item management of Depot-Level Repairables (DLRs) with the Services rather than assign that to DLA. This was a contentious decision, for which there are sound arguments on both sides; economies of scale were only one consideration.¹⁰⁷

A key point is that the search for efficiencies through economies of scale has pushed the department to move activities with redundant fixed costs from the Services to DLA, and not in the other direction. Maintaining activities in the Services is necessary when there are important operational reasons for doing so. (In the case of DLRs, for example, the Services are responsible for the effective and efficient management of their own depots, and they argued successfully that they therefore needed to retain item management of DLRs. DLA handles the contracting.)

Although there appear to be few opportunities left for consolidation and achieving greater economies of scale, one possibility is that there may be certain Service warehousing and distribution functions that would profit from DLA management. The military Services continue to own and operate large storage and distribution operations at their bases throughout the U.S. and the world. These warehouses and other facilities are involved in the distribution of everything from food to ammunition to equipment. From time to time, discussions are held between DLA and the Services regarding whether DLA's expertise in inventory management and storage and distribution might be put to good use by the Services. It may be, for example, that the Services maintain large amounts of warehouse space that could be consolidated if DOD were to take an enterprise-wide approach. In addition, DLA's expertise in the efficient management of storage and distribution facilities—from databases to the mechanics of “store-pick-pack-and dispatch”—might allow the Services to save money. Whether there are gains to be made from consolidations and economies of scale is speculative until a more thorough analysis is performed by the Services and DLA.

With the formation of TRANSCOM in 1987 (see chapter 2), the control of most strategic mobility assets moved from the Services and GCCs to TRANSCOM. There is near universal agreement that this consolidation resulted in improved military effectiveness and efficiency.

The question of whether TRANSCOM and DLA might benefit from some form of consolidation presupposes that there is some common set of fixed costs that could be reduced by means of a combination. This research, however, finds no evidence of the existence of such redundant fixed costs within the two organizations.

¹⁰⁷ See Richanbach, et al. (2014).

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6. Working Capital Funds

For most DOD organizations, whether combat or supporting forces, Congress directly funds the costs necessary for their outputs by direct appropriations. These direct-funded costs are publicly documented within budget justification material. But for DLA and TRANSCOM, many of these organizational outputs are financed through a working capital fund (WCF).

A working capital fund creates a buyer-seller relationship between supported and supporting organizations, with the supported organizations acting as buyers and the supporting organizations, like DLA and TRANSCOM, acting as sellers. The sellers, operating in a working capital fund, set rates for goods and services sufficient to cover some or all of the associated costs of their products. The buyers, using funds directly appropriated by the Congress, determine their support requirements and “buy” these goods and services from the working capital funds. Buyers submit actual orders for these products, and transfer available budget authority to the seller. The seller uses this income to reimburse its costs.

This arrangement serves to raise cost awareness among buyer and seller organizations. In turn, this cost awareness acts to ration support demands from buyer organizations, and puts cost pressures on seller organizations. Similar to a retail market setting, if selling prices are too high, buyers may seek to substitute equivalent product from other suppliers. Since a seller working capital fund ordinarily receives no direct appropriations to produce these products, fewer sales may cause a fund to earn insufficient funds to cover the cost of its operations.

Despite their common use of the working capital fund concept, DLA’s and TRANSCOM’s implementation are financially very different. These differences will be specifically detailed in the discussion to follow, but will be summarized here. The difference is rooted in the fraction of costs reimbursed by the rates charged by the funds. To produce any set of WCF goods and services, various combinations of direct and indirect costs are associated with any specific good or services made available for sale. Most importantly, these combinations of direct and indirect costs represent some degree of the full cost. These costs are added to the purchase price of each item—this process is referred to as “rate setting.” In an idealized working capital fund, the rates will capture the full costs of producing its associated goods or services.

DLA represents a close approximation of this idealized full-cost working capital fund. In contrast, the TWCF—for reasons that will be made clear—represents a hybrid construct of the WCF concept. The TWCF captures a significantly smaller fraction of its total cost through its rates for TWCF services. These different concepts for reimbursement represent a major difference between the two organizations.

A. Working Capital Fund Introduction

Supply, maintenance, and strategic airlift activities in DOD have a long history of financing their operations through working capital funds. These funds trace their formal statutory origins in DOD to 1949, but conceptually they have deep roots within the military supply services (particularly the Navy) going back at least a century.¹⁰⁸

Since the financial objective of a working capital fund is for incoming revenue to offset expenses exactly, the central challenge comes in setting appropriate rates (or prices) for goods and services. If rates are set too high, excess cash balances will build up within the funds. If rates are set too low, or if demand is less than expected, the funds consume cash from the fund corpus. Regulating cash balances is one tool that OSD has for managing working capital funds. If revenue does not equal expenses at the end of the fiscal year, the rates must be adjusted for the subsequent year to make up the shortfall or overage, as the case may be.

Since 1995, there has been a formal Defense Working Capital Fund, but it consists of several semi-independent sub-funds. First there were four sub-funds (Army, Navy, Air Force, Defense-wide), then a fifth was added in 1999 (Defense Commissary Agency). Each of these sub-funds is managed separately for cash management and oversight purposes.¹⁰⁹ Multiple activities or business lines can take place within each sub-fund. Activities within the Defense-wide sub-fund include Defense Agencies such as the DLA, the Defense Information Systems Agency (DISA) and the Defense Finance and Accounting Service (DFAS). A special feature in the Air Force Working Capital Fund is the hybrid-funded set of TRANSCOM activities. These TRANSCOM activities within the Air Force's working capital fund are designated the Transportation Working Capital Fund (TWCF).

In the initial 1995 set-up, DLA and the TWCF were both operated from within the Defense-wide sub-fund. But in 1998, the TWCF was moved to the Air Force's working capital fund and has more successfully operated there since that time. One of the organizational problems generating the change was the hybrid nature of the TWCF and the need for the Air Force to reimburse certain costs not included in the TWCF.

¹⁰⁸ Statutory authority to establish working capital funds is provided to the Secretary of Defense in 10 USC 2208. For a DOD organization, program, or function to be included in a Working Capital Fund, it must have a charter, which explains the nature of goods and services to be provided by the fund, its management structure and how it will meet the following five criteria: 1. Defined organizational "outputs that relate to products or services provided by the activity group to customers." 2. "A cost accounting system is available that is capable of collecting costs of producing outputs." 3. Customers "can be identified so that resources can be aligned in the account of the customer with the requirements." 4. "The demand for goods or services...must come from multiple customers within DOD and/or other federal government entities." 5. A buyer-seller relationship exists "to the extent that the buyer can influence cost and workload and the buyer has alternative sources that can provide the products or services." See DOD 7000.14-R, Volume 11B, Chapter 2, para. 020202, 2-4 to 2-5 (April 2010).

¹⁰⁹ Cash management refers to the management of the working capital of the fund. Each fund must maintain a positive cash balance. However, since the design of the funds is that they operate on a break-even basis (neither make or lose money), fund managers must constantly seek to manage workload and rates such that a positive cash balance is maintained, but excess cash (profits) are not generated.

To appreciate the varied implementation of the working capital fund concept requires a contrast with the much more common financing of direct funded activities. Costs for direct-funded DOD organizational activities are financed directly by Congress in a series of individual appropriations, which can be summarized in five primary categories:

1. Operations and Maintenance (O&M)
2. Military Personnel (MILPAY)
3. Procurement (equipment purchases)
4. Research, Development, Test & Evaluation (RDT&E)
5. Military Construction (MILCON) and Family Housing

Typical direct-funded organizations will use these five types or “colors” of appropriated funds to produce their organizational outputs. Within direct-funded DOD organization, these fund types maintain their “color” or identity and intentionally limit the scope of their use. Procurement funds must be used for equipment purchases. Military Pay must be used for military members of the organizations. This is a simplified view, but these simplifications serve to allow comparisons with working capital funded organizations.

Types of costs within a working capital fund are similar to those in direct funded organizations (i.e., equipment procurement, pay, needs for research and development, etc.). However, these costs are financed differently. As discussed, rather than receiving direct financing through appropriations, working capital funds are financed by customer orders. These customer orders carry budget authority from congressional appropriations. But, importantly, upon entering the working capital fund organizational boundary, the funds become “colorless.” From the perspective of the working capital fund, the orders simply carry budget authority to reimburse the working capital funds for some or all of the costs necessary to produce the goods or services ordered. The budget authority from customer orders is merged into one account to cover these associated costs. Essentially, a working capital fund manages costs and cash, and not the various appropriation accounts that a direct funded organization must manage.

At a broad level, the relative size of DLA and TWCF costs reimbursed by customers are very different. FY2015 TWCF costs were \$8.1B, while DLA costs for the same year were more than four times larger, \$38.1B. The extent to which the full costs of producing the goods and services may vary from fund to fund depends upon the charter and structure of the fund. If only a portion of the total costs for an organizational activity are reimbursed to the working capital fund by customer purchases, then some degree of direct funding will be necessary. This “hybrid” arrangement of direct funded and working capital funded organizational costs is used by the TWCF.

B. Defense Working Capital Fund – DLA

Some defense agencies are direct funded, while others, like DLA, are largely financed by a working capital fund. In terms of dollar value, only a few, small activities, generally separated from the DLA core business areas, are direct funded. Since its creation, when it consolidated common supply functions among the military departments, the costs of these common activities have now grown to an annual Working Capital Fund revenue of \$38.2B (FY2015). The DLA portion of the Defense Working Capital Fund is subdivided into two major business lines: supply chain management (66% of FY2015 revenue at \$23.0B) and energy management (33.6% at \$15.2B). Energy management provides for the vast majority of fuel consumed by the DOD.

Management of a \$38B activity should never be over-simplified. Yet a large fraction of the costs necessary to produce DLA outputs in its two business lines consist of the costs of goods sold. The costs of goods sold represent the basic pass-through costs of DLA purchasing an item from commercial or military sources to be distributed to DLA customers. Such purchases represent 85% of DLA Energy's costs and 77% of costs in DLA's supply chain businesses (FY 2015). Aside from issues of smartly purchasing input materials for its two business lines, DLA management can focus on managing its internal costs and meeting customer demands.

For each of its millions of products, DLA direct and indirect internal costs are factored into its product costs through its working capital fund rate setting process. Nominally, these rates begin with the cost of the goods and progresses to the allocation of other internal DLA costs. Detailed DLA revenue and costs are shown in the chart below. Beyond the cost of the goods sold, DLA's total costs within the working capital fund were \$7.7B for FY2015 (including \$2.3B for military and civilian compensation, \$0.8B for transportation, another \$0.8B for facilities maintenance, and the remaining \$3.8B in numerous other categories). Capital goods, such as warehousing equipment and supply management information technology, along with depreciation, are costs booked within the working capital fund and passed on to customers through the associated rates for each item.

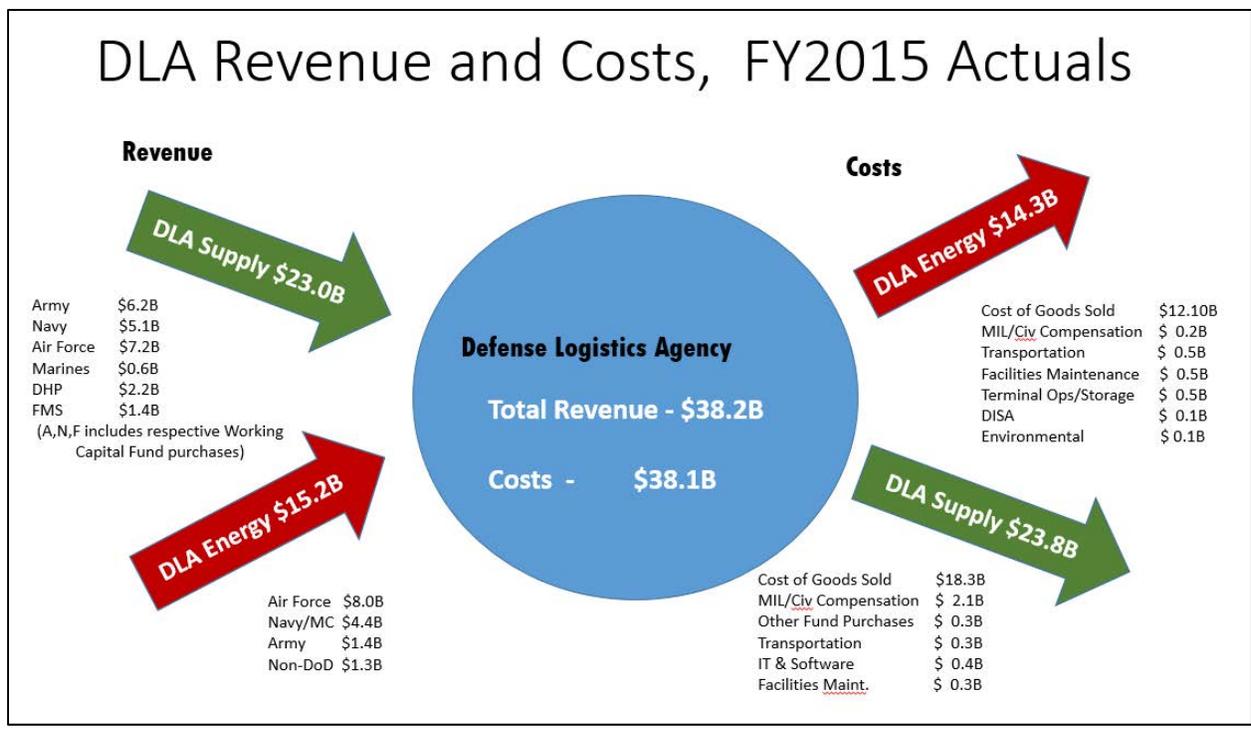


Figure 12. DLA Revenue and Costs

How much of DLA total costs are actually covered from within the working capital fund? A gross and very crude answer would be to compare DLA reported costs (financed from within the working capital fund) with the total direct-funded dollars appropriated to DLA through the congressional budget process. This exercise supplies a first cut sense of the relative completeness of the DLA implementation of its financing through the working capital fund. It includes financing for activities outside the working capital funds, but it may include some within. Examination of the budget justification material for FY2017 show actual FY2015 direct-funded spending of \$843.3M. Some of these, as expected, are not costs associated with central DLA business lines of supply and energy. For example, activities formerly associated with the DOD Business Transformation Agency were assigned to DLA when the Business Transformation Agency was dis-established in 2011. But overall, as a gross sense of DLA's implementation of the working capital fund concept, the total of \$843.3M direct-funding for FY2015 shows that only about 2%–3% of its total organizational costs (for all its assigned activities), are financed by direct-funding. The point of this detail is to create a basis of comparison between the DLA and the TWCF implementation of their respective working capital funds.¹¹⁰

¹¹⁰ A more refined starting question would be: How much of DLA's total costs for the products that are within its working capital fund business lines are actually covered by working capital fund revenue? In this case, the \$843.3M of direct funding in FY2015 would be an extreme upper bound. It includes, for instance \$238.9M in energy and fuel related construction projects which, by statute, cannot be funded through a working capital fund (military construction projects are generally prohibited from using such funding). It also includes \$372.6M in

C. The Transportation Working Capital Fund (TWCF)

This section introduces the TWCF within the larger context of TRANSCOM, one of the nine current U.S. combatant commands. TRANSCOM is unlike DLA in that its commander is given the authority to task its components to accomplish military missions, but must defer to authority of the component's military departments to make internal re-organizations or to apply for direct funding of costs outside the TWCF selectively. This section will start with a review of the major TWCF business segments, then go on to discuss TRANSCOM as a unique combatant command in terms of its use of a working capital fund.

Within TRANSCOM, TWCF associated activities consists of four major subdivisions (business lines):

Airlift: TRANSCOM provides airlift services of cargo personnel either through organic assets (the Air Force Air Mobility Command airlift fleet) or by commercial charter. Organic lift is provided through regularly scheduled (channel) service, or through dedicated missions (Special Assignment Air Mission, Contingency, or Joint Exercise Transportation Program). TWCF rates are set based on aircraft type, distance and other relevant factors. In addition, the Air Force "buys" training hours from the TWCF to assure that AMC crews maintain the required proficiency to meet readiness goals. TWCF rates are set at a per diem rate for each particular vessel.

Sealift: TRANSCOM provides sea transportation through its naval component, the Navy Military Sealift Command. Transportation is provided either on government-owned vessels, or by charter. Major uses are Army and Air Force at-sea prepositioning of material, POL¹¹¹ tankers in support of the Defense Logistics Agency, and ships maintained in a reduced operating status in support of contingencies or Joint Chiefs of Staff exercises.

Surface Deployment and Distribution: Port operations and surface distribution operations are provided through TRANSCOM's Army component, and Surface Deployment and Distribution Command (SDDC). The SDDC provides five Army Transportation Brigades, which plan for and manage port operations worldwide, including a port opening capability for contingency operations. SDDC also provides contracted surface cargo shipment and port handling services. TWCF rates are set based upon traffic area pairs. Port handling rates are set regionally by measurement ton by commodity group.

Courier Service: The Defense Courier Service provides secure shipment of classified and sensitive materials.

Operation and Maintenance funds, most of which is arguably outside of the working capital fund business lines (such as \$92M for overseeing systems formerly run by the Business Transformation Agency, and \$25M for managing some 70,000 maps for the DOD). All told, DLA has perhaps around \$400M of direct-funded activities that potentially overlap with its working capital fund business lines. See "Fiscal Year 2017 President's Budget: Defense Logistics Agency (DLA)," Feb 2016 (available at <http://comptroller.defense.gov/Budget-Materials/FY2017BudgetJustification/>, accessed December 30, 2016).

¹¹¹ POL: Petroleum, oil, and lubricants.

TRANSCOM Revenue and Expenses, FY2015 Actuals

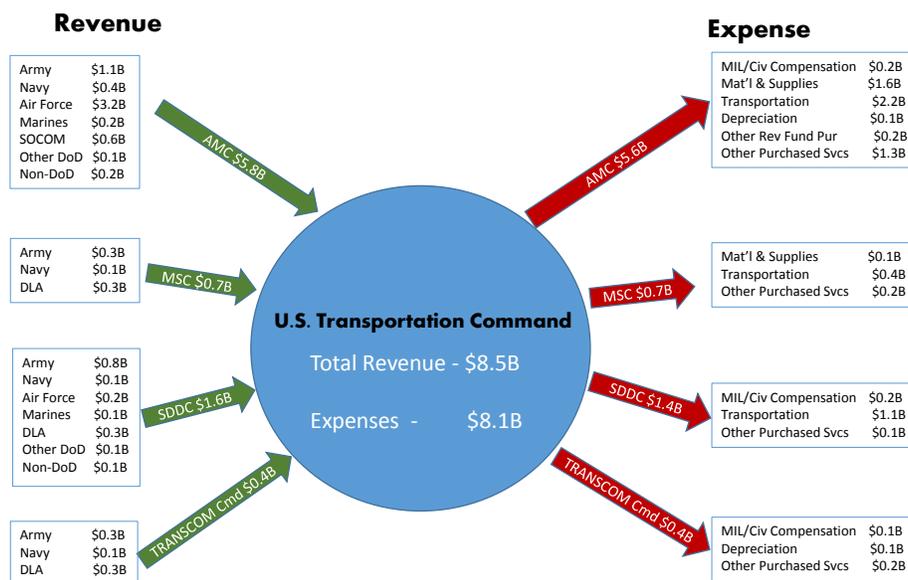


Figure 13. TRANSCOM Revenue and Expenses

The TWCF is a component of the Air Force Working Capital Fund. The TWCF finances a portion of the full set of activities performed by TRANSCOM and its assigned components. As the single unified transportation combatant command, TRANSCOM has a significant and wide-range policy role regarding defense transportation and distribution operations of the department. DLA has no such explicit policy role. But, in turn, TRANSCOM is not a defense agency. TRANSCOM is one of nine unified functional combatant commands. Combatant commands are federated organizations composed of a command headquarters along with assigned component organizations. These are warfighting military organizations subject to Presidential military command authority.

TRANSCOM-assigned forces are at the center of its design as a working capital funded organization. All U.S. combatant commands possess assigned military forces. Each military department is required by 10 USC 162 to assign its military forces to a single combatant command in the same way that TRANSCOM is assigned airlift, sealift, and port operations forces. Like all combatant commands, TRANSCOM is vitally concerned with the peacetime readiness of its assigned military forces. For all combatant commands, this readiness is achieved by peacetime joint exercises along with individual unit training. These peacetime readiness activities for TRANSCOM can similarly help generate and support peacetime readiness activities for other combatant commanders. The realistic training of their forces at appropriate locations parallels the transportation forces' need to exercise at these same locations. This possibility of using readiness of military transportation forces is at the center of the design of the TWCF. This opportunity was recognized as early 1958 with the creation of the airlift predecessor to the TWCF: the Air Force

Airlift Services Industrial Fund (ASIF)¹¹². The creation of the original ASIF regulated transportation demands from ordinary combatant commanders, while at the same time financing needed readiness activities.

The working capital fund was recognized as a useful approach for distributing and rationing a useful product of peacetime readiness activities. But full costs of transportation readiness activities are determined by the wartime requirements. The transportation forces and infrastructure overseen by TRANSCOM must be sized to meet a fully mobilized wartime mission requirements. The specific surge requirement is for the deployment of military forces located in the United States to a contingency operating location perhaps in Europe, the Pacific or in the Mid-East and to deliver these forces in a very short time. This requirement is a surge capacity for timely deployments of significant fractions of the entire U.S. military force structure and then to keep it sustained while in major combat operations. The transportation forces required by these major force-deployment scenarios require peacetime readiness, yet the financial requirement for this readiness level is well in excess of alternative commercial sources. This mismatch between the full cost of sufficient wartime transportation readiness, and the costs of commercial peacetime alternatives, is the basis for the TWCF hybrid design of its working capital fund. This is particularly true for comparisons between wartime airlift readiness costs and peacetime commercial alternatives.

This constraint sets the total revenue that can be generated from DOD peacetime customers, particularly for airlift customers. The TWCF has annual costs and revenues of in excess of \$8 billion per year, with more than half of this being airlift revenue. The TWCF, by design, does not recover the full costs of the goods and services it provides through the rates it charges. Examples of these mechanisms are the following:

Military Airlift: The rules for reimbursing the costs of operating the Air Mobility Command differ somewhat from those of other WCF activities. The costs of operating the Air Mobility Command are partially reimbursed to the Air Force by the TWCF, but to a lesser extent than in some other WCF activities, such as DLA. For example, costs for fuel, repair parts, civilian labor, and installation support at AMC bases are reimbursed through the TWCF. However, the costs of the airlifters, and any depreciation on those assets, are excluded, as well as all military personnel associated with crew or aircraft maintenance activities. This recognizes that the aircraft and crew are assets that are intended to provide a military capability, rather than income-producing assets.

Airlift Readiness Account: For many customer airlift requirements, the demand can be met through either commercial carriage or military airlift. To maintain proficiency, AMC airlift squadrons must operate at a specified peacetime rate. To make most effective use of these flight operations, AMC carries passengers and cargo for DOD customers. Under an idealized working capital fund concept, DOD will charge these customers the full cost of flight operations. However, the charge at full cost recovery rates would be in excess of commercial rates, thus incentivizing DOD customers to bypass TRANSCOM and seek commercial carriage. To balance customer and

¹¹² The ASIF was a similar design to the present-day Working Capital Fund.

provider requirements, airlift rates are set approximately equal to those charged by commercial carriers. This serves to limit the cost to customers, yet allows TRANSCOM to partially recover its operating costs. To cover the excess costs, the Air Force subsidizes military flight operations using appropriated funds, through the Airlift Readiness Account (budgeted in Operations and Maintenance, Air Force).

Port Operations: SDDC commands five geographically oriented Army Transportation Brigades. These brigades perform port readiness functions and a global presence at 19 CONUS seaports and 24 global ports. Among the functions performed by these brigades are contingency cargo management planning, maintaining mobility assets for wartime readiness, performing installation management for ammo terminal services, and maintaining required information technology systems. In accordance with decisions dating to 1997, these brigade costs are to be excluded from port handling rates. The costs, instead, are recouped on a pro-rata basis from the military services under support agreements.

TRANSCOM Headquarters: TRANSCOM Headquarters is partially funded by charging the four business lines for common services provided by headquarters elements. Therefore, the TWCF finances, in whole or in part, a combatant command headquarters and assigned forces headquarters operations. The TWCF also partially finances the transportation services TRANSCOM provides, either through use of military assets or by contract

These variances from “normal” DWCF accounting make the TWCF inherently more difficult to understand, at a macro level, from the perspective of an outside observer. This results from the set of costs chosen for inclusion within the TWCF and the unusual mechanisms chosen to include a working capital mechanism within a combatant command.

D. Financial & Managerial Comparison of the DLA WCF and TWCF

Both DLA and TRANSCOM cooperate within the wider domain of the DOD Distribution Process. They both participate and complement each other in the peacetime and wartime sustainment of the military forces. In fact, interviews with senior-DLA management regarding its wartime sustainment activities emphasize the similarities of its peacetime and wartime processes and its ongoing collaborations with TRANSCOM. But a focus on the complementary nature of the DLA-TRANSCOM activities often overlooks their important differences functionally, managerially, and financially. The most significant functional difference between DLA and TRANSCOM’s is the latter’s focus on wartime military force deployment.

These wartime demands for force deployment are codified in military war plans and threat scenarios. For these plans and scenarios, the timely deployment of U.S.-based military forces constitutes the basis for much of the TRANSCOM force structure. TRANSCOM’s quantity of airlift aircraft and crews, of sealift ships, and of surface distribution forces are generally set by the need to meet the extreme surge demands of large-scale deployments. These transitions from peacetime to wartime deployment operations represent extraordinary increases in operating tempo.

TRANSCOM airlift flying hours are projected to increase by 200-300 percent from peacetime to peak wartime deployment scenarios and require sustainment for weeks and months. Few commercial analogies match a surge of this magnitude and duration. For example, seasonal increases in U.S. Postal Service mail volume are reported as only 30-40 percent larger than the average monthly baseline. For both the post office and industry, demands of this type are addressed through seasonal augmentation. In contrast, TRANSCOM is required to maintain a large standby force, sized to achieve a satisfactory surge capacity. This standby readiness requirement, in turn, becomes the unique basis for the TWCF and drives its differences with the DLA WCF concept.

Joint Distribution Major Phases – TRANSCOM/DLA Participation

	Peacetime Sustainment	Force Deployment	Wartime Sustainment	Force Redeployment
TRANSCOM				
DLA		Limited Role		

Adapted from
Joint Publication 4-09
"Distribution Operations"
December 2013

Figure 14. Joint Distribution Major Phases—TRANSCOM-DLA Participation

Another difference between the two organizations is management authorities. DLA is a civilian DOD organization with significant managerial authority over its assigned resources. In contrast, TRANSCOM is a military headquarters exercising a more limited managerial authority over its assigned military forces. This limited authority is focused on wartime operations. Combatant command is focused on the combatant commander’s wartime use of military forces assigned by a military department. Military departments maintain a wartime supporting responsibility for their assigned forces, but have no operational authority over their use. In peacetime, combatant command is inherently concerned with the readiness of its assigned forces since they serve as the combatant commander means for accomplishing their military missions. The combatant commander monitors the readiness of assigned forces through a component headquarters of the supplying military department. This component headquarters has the responsibility for financial support and administration of the assigned forces. The DLA director’s managerial authority over their agency is closer to the military department’s authority over their assigned forces to TRANSCOM, than the formal authority of the combatant commander over those same forces. The crucial and unique difference of combatant command is the responsibility for effective wartime operational activity.

DLA and TRANSCOM managerial differences are not diminished by their common use of a working capital fund. TRANSCOM’s implementation of a working capital fund is arguably unique within the entire DOD. No other combatant command headquarters are financed in this way. No other combatant command’s assigned military forces are financed even in part by a working capital fund, as are TRANSCOM’s assigned airlift, sealift, and surface distribution forces. The TRANSCOM military working capital fund is designed around funding a readiness program. The readiness of assigned forces is common to all combatant commands. Ordinarily, funding for the readiness of assigned forces is the responsibility of the military departments. But TRANSCOM uniquely operates a working capital fund to partly provide for the readiness of its assigned forces.

Comparison	TRANSCOM	DLA
Operational Focus	Force Deployment (wartime) focus, thru peacetime readiness	Sustainment (peacetime), wartime readiness
Managerial Control	Federated relationships with assigned forces. Management limited to COCOM authorities	Fuller managerial authority over Organization
Financial (Working Capital Fund Design)	Hybrid Concept: customer charges limited to commercial equivalent rates to ensure readiness of assigned forces	Charges customers full cost of major business lines (Supply, Energy)
Oversight	Military Operational – SECDEF through CJCS	OSD Civilian – USD(AT&L) through ASD(Logistics & Material Readiness)

Figure 15. TRANSCOM-DLA Comparisons

One reason for this unique readiness financing of military transportation forces is that their readiness activities can provide a useful byproduct to the rest of the DOD. There has been a 60-year history of successfully allocating the byproduct of this transportation readiness activity through the mechanism of a working capital fund. Military users in DOD need transportation services. These include routine part shipments, or actual forces movement to distant exercise areas. For both cases, particularly for the first, military transportation customers may be indifferent to military or commercial transportation. The transportation working capital fund recognizes this circumstance and seeks to set its rates at commercial level. Without this pricing policy, the military customer would be reluctant to fund higher-cost military transportation, and otherwise require transportation readiness activities to be direct funded. If military transportation was provided as a free good, i.e., it was wholly financed by direct funding, it would potentially be overwhelmed by demands. The TWCF mechanism operating at essentially commercial rates addresses these issues. The actual mechanism of rate setting is beyond the scope of this paper.

Utilizing the TWCF as a readiness funding mechanism is a different implementation of a WCF from DLA. As discussed earlier, DLA appears to reimburse more than 97 percent of its supply and energy service costs from customer revenue. In this sense, DLA is a textbook implementation within DOD of a working capital fund. In contrast, the readiness funding of transportation services within the TWCF are of a qualitatively different order. The TWCF itself is a hybrid implementation of a WCF. It funds selected costs of DOD transportation services (i.e., readiness funding). This is different from the nearly complete cost funding of DLA supply and energy services. Determining a percent of total funding covered by the TWCF hybrid is difficult. But it is significant that TRANSCOM's reported costs for FY2016 airlift services, about 70 percent of TWCF total costs, include no supporting military manpower costs for either airlift crews or maintenance activities. Also not included are the costs to purchase the airlift aircraft themselves. These additional costs are routinely borne by the Air Force. Military airlift related costs of about \$3.0B for FY2016 are included in the TWCF. These costs include depot maintenance, fuel, spare parts, etc. These costs are largely covered by TWCF customer revenue, but when customer revenue falls short of TWCF airlift costs, the Air Force is required to direct fund an airlift readiness account to maintain sufficient airlift capability for TRANSCOM.¹¹³

¹¹³ See Financial Management Regulation, Volume 2, Chap 9, para 090103 D.6 (9-17), November 2009.

7. Findings and Recommendations

A. DOD-Wide Economies of Scale

Findings:

- DOD has increased its operational effectiveness and realized significant efficiencies by assigning management of the Defense Transportation System and command of military department transportation components to TRANSCOM.
- DLA has recognized expertise in storage and distribution, including warehouse operations. Since its creation, DLA has been the product of numerous waves of consolidation—allowing DOD to achieve considerable economies of scale in numerous supply functions. As a result of the 2005 BRAC, DLA assumed important retail responsibilities at the military Service depots, and its retail expertise is improving.
- Combining TRANSCOM and DLA would not enable DOD to realize clear operational gains or additional economies of scale.

Recommendation 1. **Do not consolidate part or all of TRANSCOM and DLA**

- There are no known, unharvested economies of scale.
- TRANSCOM and DLA already collaborate well with one another.

Recommendation 2. **Continue Exploiting DOD-Wide Economies of Scale**

- The Secretary of Defense, through OSD, should ensure that DLA continues to improve its supply chain operations at the retail level. As these improvements are realized, DOD should consider further consolidation of military Service storage and distribution functions into DLA.

B. End-to-End Distribution Readiness

Findings:

- Changes to force structure and adversary capabilities have diminished DOD ability to conduct joint deployment and distribution in an immature theater.
- DLA and TRANSCOM currently collaborate with the military departments and GCCs to prepare for major contingencies. However, budget pressures have led each of these organizations to downsize resources and capabilities devoted to distribution functions.
- These localized decisions have compounded across the end-to-end distribution system, creating a heightened level of risk for DOD's wartime readiness and effectiveness. To amplify this risk, there is no longer an expectation that logistics operations will function in uncontested environments as they have in the past.

Recommendation 3. **Improve End-to-End Distribution Readiness**

- The commander of TRANSCOM should lead a DOD-wide risk assessment of distribution scalability to support current planning scenarios. This would entail assessing the ability of the Joint Deployment and Distribution Environment (JDDE) to surge its end-to-end capacity to rapidly achieve distribution objectives, particularly in contested environments and immature theaters.
- This assessment should consider the adequacy of manning levels in organizations with distribution and transportation responsibilities, including the GCCs, the military Services, TRANSCOM, and DLA.
- The commander of TRANSCOM, as the DPO, must continue to lead improvements in DOD distribution capabilities through enhanced collaboration among all of the actors in the JDDE.

C. Information Harvesting

Findings:

- Optimizing end-to-end distribution requires the integration of information from diverse systems, both government-owned and commercial.
- Numerous distribution-related information systems throughout the department are under revision or development. These include EBS, DSS, TMS, and GCSS-A.¹¹⁴ Although past efforts to harmonize architectures across systems have proven difficult, recent advances in information technology, including advances in “Big Data,” leave experts more optimistic about the possibilities for achieving better enterprise-wide collaboration and use of data.

Recommendation 4. **Formalize an Information Harvesting Strategy**

- The commander of TRANSCOM should champion a clearer end-to-end understanding of logistics and distribution assets, demands, and costs. He should lead the development of a logistics information harvesting strategy that includes the Joint Staff, OSD, the Services, and the GCCs.
- The commander of TRANSCOM and the director of DLA should determine how best to use the capabilities of DLA (including the J-6 organization, Information Operations) as part of this information harvesting strategy.

¹¹⁴ EBS is DLA’s Enterprise Business System, a SAP-based ERP solution that ties together most of DLA’s business functions. Distribution Standard System (DSS) is DLA’s warehouse management system. TMS is a generic term for a transportation management system. GCSS-A, the Global Combat Support System, is a SAP-based ERP for Army logistics.

D. TWCF Transparency and Flexibility

Findings:

- Due in part to the hybrid nature of the TWCF, TRANSCOM rates are not as transparent to the customers as they are for some other working capital funds. Nonetheless, improved transparency would benefit both TRANSCOM and its customers.
- As currently managed and structured, the TWCF provides TRANSCOM with less flexibility than that practiced by other working capital fund organizations. This makes it more difficult for TRANSCOM to work in support of enterprise-wide distribution requirements.

Recommendation 5. Improve TWCF Transparency and Flexibility

- The commander of TRANSCOM should improve communications with customers on how TWCF rates and costs are calculated, and ensure that the TWCF can be used to address enterprise-wide needs.

E. The Seven Congressional Topics

In its request for this study, the U.S. Congress directed that specific topics be addressed. The results are summarized here:

1. DLA's use of TRANSCOM's DTCl.
 - DLA and TRANSCOM collaborate effectively on the use of DTCl (now DFTS).
2. DLA's efforts to improve supply alignment and TRANSCOM's role in DLA's efforts.
 - DLA and TRANSCOM collaborate effectively.
 - The challenge is with the Services.
3. DLA's and TRANSCOM's efforts to identify and implement transportation and distribution efficiencies.
 - DLA and TRANSCOM collaborate effectively.
 - Economies of scale are being taken advantage of. No further (significant) economies of scale are available between the two organizations.
 - TRANSCOM management of the TWCF should be more transparent, and may benefit from DLA lessons learned.
4. The role of the individual services in the identified functions of DLA and TRANSCOM, and whether there would be any efficiencies gained by moving any functions from DLA and TRANSCOM to the services.

- Moving functions back to the Services would likely harm the benefits gained (over several decades) from the economies of scale in DLA and TRANSCOM.
 - Improved Service collaboration with the DPO on end-to-end readiness and information harvesting would be highly beneficial.
 - Further economies of scale may be possible by moving selected storage and distribution from the Services to DLA.
5. Identification of senior flag officer positions no longer required at DLA and TRANSCOM due to consolidation and delegation of functions.
- Consolidation is not a recommended course of action.
6. Recommendations regarding the future need for TRANSCOM to remain a combatant command due to the consolidation and delegation of functions.
- Consolidation is not a recommended course of action.
7. Any other recommendations on ways that a reorganization or consolidation of these entities could improve efficiencies, including the shifting of any functions out of either organization back to the military Services.
- Consolidation would not achieve meaningful economies of scale.
 - Effort should be focused on improving end-to-end distribution readiness.
 - A concerted effort needs to be made to formalize an information harvesting strategy.
 - TRANSCOM should pursue its efforts to improve TWCF transparency, including taking advantage of DLA lessons-learned.

Table 8. Summary of Results Arrayed Against the Seven Congressional Topics

Recommendations Congressional Questions	1. Do Not Consolidate Part or All of TRANSCOM and DLA	2. Continue Exploiting DOD-Wide Economies of Scale	3. Improve End-to-End Distribution Readiness	4. Formalize an Information Harvesting Strategy	5. Improve TWCF Trans- parency and Flexibility
1. DLA Use of DTCI	No need for, or value added from, consolidation	Economies of scale are being exploited by TRANSCOM and DLA	N/A	N/A	N/A
2. DLA Supply Alignment	No need for, or value added from, consolidation	Collaboration is effective (e.g., stock positioning)	Collaboration is effective; the challenge is with the Services	Collaboration is effective; the challenge is with the Services	N/A
3. DLA- TRANSCOM Efficiencies	No need for, or value added from, consolidation	Collaboration is effective (e.g., stock positioning)	N/A	N/A	DLA Lessons Learned from TRANSCOM
4. Service Roles	N/A	Further economies of scale may be possible by moving from Services to DLA	Services should be encouraged to collaborate more with DPO/JDDE	Services should be encouraged to collaborate more with DPO/JDDE	N/A
5. Senior Flag Officers	No consolidation	N/A	N/A	N/A	N/A
6. TRANSCOM as COCOM	No consolidation or change	Economies of scale are being exploited by TRANSCOM	Commander TRANSCOM has critical role to play	Commander TRANSCOM has critical role to play	N/A
7. Other Recommendation	No need for, or value added from, consolidation	Build on 50 years of success	The key challenge for DOD Distribution	The next challenge for DOD Distribution	Overcome the challenges of a hybrid TWCF

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Appendix C. Abbreviations

AMC	Army Materiel Command
BRAC	Base Realignment and Closure
DFAS	Defense Finance and Accounting Service
DFTS	Defense Freight Transportation Services
DLA	Defense Logistics Agency
DLR	Depot-Level Repairables
DOD	Department of Defense
DPO	Distribution Process Owner
DTCI	Defense Transportation Coordination Initiative
DTS	Defense Transportation System
DVD	Direct Vendor Delivery
DWCF	Defense Working Capital Fund
EBS	Enterprise Business System
ERP	Enterprise Resource Planning
FOB	Forward Operating Base
GCC	Geographic Combatant Command
IDA	Institute for Defense Analyses
ITV	In-Transit Visibility
JDDE	Joint Deployment and Distribution Environment
JTF-PO	Joint Task Force–Port Opening
L&MR	Logistics and Materiel Readiness
MSC	Military Sealift Command
OEF	Operations Enduring Freedom
OIF	Operations Iraqi Freedom
OSD	Office of the Secretary of Defense
SAAM	Special Assignment Airlift Missions
SDDC	Surface Deployment and Distribution Command
SES	Senior Executive Service
SMS	Single Mobility System
TSC	Theater Sustainment Command
TWCF	Transportation Working Capital Fund
UCP	Unified Command Plan
USTRANSCOM	United States Transportation Command

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