



Department of Defense

Material Distribution Improvement Plan

**Office of the Assistant Secretary of Defense
for Logistics and Materiel Readiness**

September 2016

**Globally Responsive, Operationally Precise, and Cost-Effective Joint Logistics Support for the Projection
and Sustainment of America's Warfighters**



A Message from the Acting Assistant Secretary of Defense for Logistics & Materiel Readiness

This *Materiel Distribution Improvement Plan* (MDIP) will guide and direct Department of Defense (DoD) efforts to improve materiel distribution support to the warfighter. It details specific goals and actions to enhance the measurement of the end-to-end distribution process, ensure the accuracy of underlying data used to measure that process, and strengthen and integrate distribution policies and the joint deployment and distribution enterprise (JDDE) governance structure.

This MDIP addresses recommendations made in the February 2015 update to the *GAO High-Risk Series*. These include developing a detailed “corrective action plan,” “developing measures to assess performance across the entire distribution pipeline,” and “ensuring performance metrics are based on reliable data to assess performance.”¹ To integrate efforts, this MDIP links to the *DoD Logistics Strategic Plan*, *Comprehensive Inventory Management Improvement Plan*, (CIMIP) and *Strategy for Improving Asset Visibility*.

The plan’s objective is to help the distribution process “deliver the right item to the right place at the right time, and also at the right cost.”² To do so, it sets goals and actions under three lines of effort critical to the Department’s materiel distribution success:

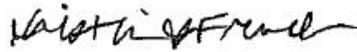
- *Metrics and performance.* Measure end-to-end distribution performance at appropriate levels, using measures that capture the key distribution performance attributes of responsiveness, reliability, cost/efficiency, and information visibility. Use standards that balance distribution provider capabilities with customer needs and available resources. Apply those metrics at all JDDE levels to identify distribution performance gaps and take timely, corrective action when performance does not meet standards.
- *Data accuracy.* Ensure we have the best quality data available to support distribution performance measurement and facilitate the identification of root causes for performance shortfalls. Establish a data quality policy and infrastructure with internal controls, standards, and measurement processes for continually assessing and improving distribution data quality. This infrastructure will comply with the *Standards for Internal Control in the Federal Government*.
- *Policy and governance.* Prepare clear, comprehensive distribution policy documents that align with current and planned distribution strategies, processes, and initiatives. Integrate and empower our JDDE governance structure to monitor overall distribution performance; formulate strategies; evaluate processes, standards, business rules, and initiatives

¹ U.S. Government Accountability Office (GAO), *High-Risk Series: An Update*, GAO-15-290, February 2015, p. 194.

² See Note 1.

for distribution improvement; and recommend effective joint distribution solutions. A robust policy and governance structure ensures the Department can form, implement, and monitor corrective actions that address root causes and close distribution performance gaps once they are identified.

The goals and action steps in this plan, built in support of these three lines of effort, will enable the Department to actively manage its materiel distribution function for continual process improvement.



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Chapter 1

Approach and Background

Since the late 1970s, Department of Defense (DoD) materiel distribution processes, procedures, and organizational structures have evolved to enable superior warfighter support around the world. Today, the Department conducts materiel distribution functions through a joint deployment and distribution enterprise (JDDE), with U.S. Transportation Command (USTRANSCOM) and the Services providing the strategic transportation assets and processes needed for effective and efficient materiel distribution operations.¹

Although the operations tempo (OPTEMPO) remains high, DoD has successfully conducted several operational deployments—including two major counterinsurgency campaigns and numerous foreign and domestic humanitarian assistance/disaster relief (HA/DR) missions—in the last 15 years. To achieve this sustained, high performance, materiel distribution stakeholders coordinate and synchronize their efforts through the JDDE.

The JDDE, coordinated by USTRANSCOM as the DoD distribution process owner (DPO), facilitates centralized control and decentralized execution, enabling flexibility of response and adaptation to changing situations while preserving the benefits of centralized planning, promoting enterprise efficiency and effectiveness gains, and achieving unity of effort through independent but coordinated action. Through the JDDE, the various materiel distribution stakeholders bring their collective operations and outputs under an enterprise framework to integrate, synchronize, and optimize distribution.

Like any high-performing organization, DoD continually seeks ways to improve functions and processes. The Office of the Deputy Assistance Secretary of Defense for Supply Chain Integration, ODASD(SCI), established the Distribution Working Group (DWG) under the purview of the Supply Chain Executive Steering Committee (SCESC) to take an independent, comprehensive look at materiel distribution. This is in keeping with similar efforts under the auspices of the SCESC that led to the development of the DoD *Comprehensive Inventory Management Improvement Plan* (CIMIP) and *Strategy for Improving Asset Visibility*. The DWG developed this *Materiel Distribution Improvement Plan* (MDIP) to serve as the basis for corrective actions to be executed through the JDDE governance structure to help improve end-to-end distribution performance while maintaining the ability to remain effective even during conflict with a peer competitor.

APPROACH

The recommended actions will close identified performance gaps and capitalize on opportunities to improve distribution performance. The MDIP describes a way forward for

¹ Appendix B details the history of the establishment of USTRANCOM as a functional combatant command and the development of the JDDE.

improving DoD materiel distribution through a careful review of distribution performance across the enterprise along three lines of effort (LOEs):

- Metrics and performance
- Data accuracy
- Policy and governance.

The metrics and performance and data accuracy LOEs focus on measuring materiel distribution performance, identifying performance gaps, and ensuring accurate, quality data that support proper measurement and inform root cause analysis. The policy and governance LOE addresses how root causes for performance gaps should be identified and effective corrective actions established and monitored.²

The Distribution Steering Group (DSG) will assume responsibility for execution of the approved MDIP. The JDDE governance structure should adequately resource and staff each recommended action in the MDIP to achieve its completion and close any identified performance gaps within the timeframe specified. The JDDE governance body should regularly update the SCESC on progress toward plan implementation.

BACKGROUND

DoD views *distribution* as a critical element of joint operations that enables the projection and sustainment of military power. Joint Publication (JP) 4-09 defines it as “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.”³ It “includes the ability to plan and execute the movement of forces for deployment and redeployment as well as sustainment and retrograde.”⁴

Materiel distribution is a part of overall supply chain operations—the global network of DoD and commercial supply, maintenance, and distribution activities that acquires and delivers materiel and logistics services to the joint force. “Its fundamental goal is to maximize force readiness while optimizing the allocation of limited resources.”⁵

The DoD distribution function serves the collective needs of the JDDE community of interest (COI). The JDDE itself includes the equipment, procedures, doctrine, leaders, technical connectivity, information, organizations, facilities, training, and materiel necessary to conduct joint distribution operations, while the “JDDE COI is the collaborative

² Appendix A lists the members of each sub-working group that reviewed each LOE and formed the action recommendations.

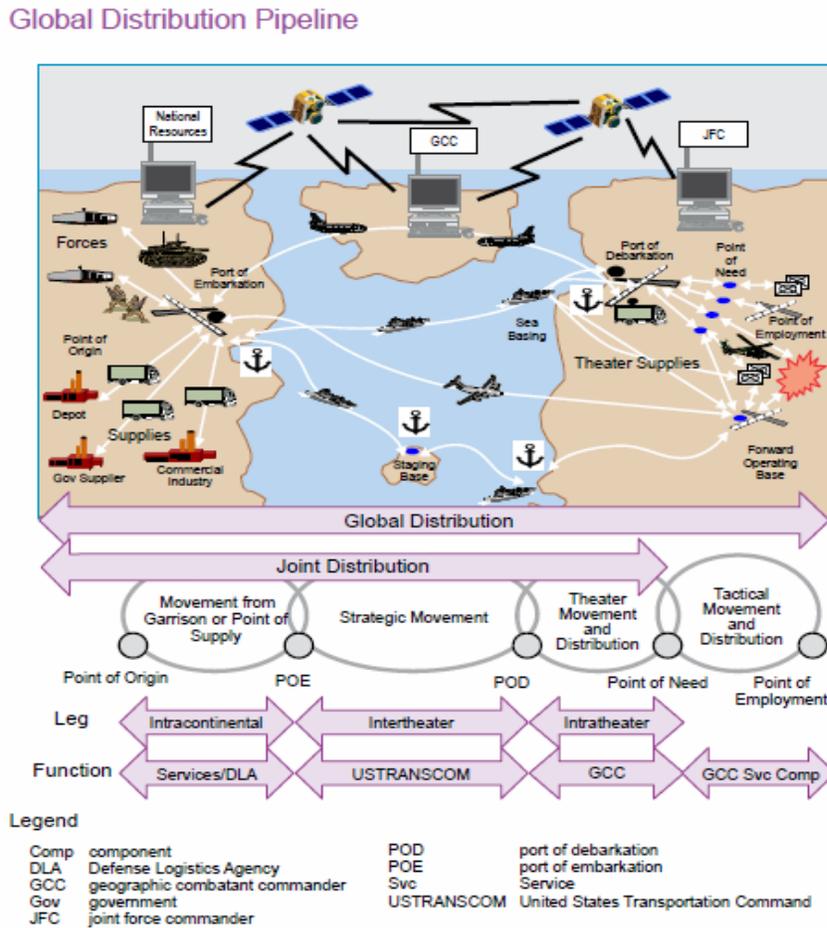
³ Department of Defense, JP 4-09, *Distribution Operations*, 19 December 2013, p. ix.

⁴ See Note 5, p. ix.

⁵ See Note 5, p. x.

network of JDDE partner organizations ... sharing common distribution-related goals, interests, missions, and business processes” constituting end-to-end distribution.⁶ Figure 1-1 shows the materiel distribution function and pipeline.

Figure 1-1. Global Materiel Distribution Pipeline



Source: JP 4-09, *Distribution Operations*, December 19, 2013, p. I-2.

DoD global distribution is a complex activity, and the JDDE has many participants and stakeholders. Collectively, the JDDE “runs” the materiel distribution function from end to end, consisting of four legs of movement that bridge specific beginning and end points:

- The Intracontinental Leg, movement from the point of origin (garrison or point of supply) to the port of embarkation (POE)
- The Intertheater Leg, strategic movement across transcontinental distances from the POE to the point of debarkation (POD)

⁶ See Note 5, pp. ix–x.

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- The Intratheater Leg, movement from the POD to the point of need
 - The Tactical Leg, movement from the point of need to the point of employment where the materiel is actually used or consumed.

Each leg roughly corresponds to a different entity in the JDDE that has responsibility for the function of that leg. These four entities, key to each leg and collectively responsible for effective materiel distribution operations, are as follows:

- *Intracontinental.* The Defense Logistics Agency (DLA), the primary operator of the defense supply and depot system, is responsible for the acquisition, receipt, storage, issuance, and generation of source data for all materiel (other than that procured by the individual Services) flowing through the defense distribution pipeline. The Services are also involved in the Intracontinental Leg, moving limited amounts of select classes of materiel in CONUS, but from a JDDE perspective, they focus primarily on deployment of the force rather than distribution of materiel.
- *Intertheater or Strategic.* USTRANSCOM, the single manager for DoD transportation, is responsible for providing organic (other than Service-unique or theater-assigned assets) and commercial air, land, and sea transportation; terminal management; and aerial refueling to support the global deployment, employment, sustainment, and redeployment of U.S. forces. USTRANSCOM is also DoD's DPO, responsible for coordinating and synchronizing the Department's distribution system to provide interoperability and end-to-end alignment.
- *Intratheater.* The supported combatant commander (CCDR) is responsible for the development and production of plans and orders in response to mission taskings, as well as integrating military activities with interagency/diplomatic activities in their area of responsibility (AOR). The CCDR is responsible for articulating theater requirements, including sustainment requirements, that drive much of the flow of materiel through the global distribution pipeline. CCDRs exercise directive authority for logistics (DAFL) for assigned forces in their AOR, including developing and maintaining an effective theater distribution system and procedures that are responsive to theater and mission needs.
- *Tactical.* The Service components provide forces and equipment to the supported combatant command (CCMD) in response to a mission tasking, including transportation assets assigned to support tactical movement and distribution within the theater (from point of need to point of employment) in support of CCMD mission objectives and priorities. The Services or Service components also control organic distribution assets that support the movement of forces and equipment from garrison or point of supply to the POE in the Intracontinental Leg.

The following sections discuss each of these entities and their roles in materiel distribution.

JJDE PARTNERS ROLES/MISSIONS

Defense Logistics Agency (DLA)



DLA provides worldwide logistics support in peacetime and wartime to the Military Services, as well as several civilian agencies and foreign countries. DLA has primary responsibility for the “supplier” segment of DoD distribution. The Agency supports more than 2,000 weapon systems, provides over 85 percent of the Services’ repair parts, and provides nearly 100 percent of Services’ subsistence, fuels, medical, clothing and textiles, and construction and barrier material. Approximately four million managed secondary items are used to support military personnel, equipment, and systems.⁷

DLA comprises 25,297 civilians, 581 active duty military personnel, and 752 reservists located in 48 states and 28 countries. DLA manages nearly 5.1 million items through nine supply chains and staffs 26 distribution depots worldwide.

As the principal organization executing DoD’s inventory management (IM) function, DLA has always been heavily involved in materiel distribution issues. It also provides asset visibility (AV) over its items moving through the distribution pipeline. Since 2003 (commensurate with USTRANSCOM’s designation as the DPO), DLA has been identified as a partner with USTRANSCOM.

DLA’s seven overseas distribution depots offer opportunities to forward position stock—especially high-usage items—closer to the potential point of need to enhance in-theater distribution and shorten the distribution pipeline.

USTRANSCOM



The heart of the DoD materiel distribution function, USTRANSCOM consists of a large, diverse force of 45,945 full-time active duty personnel, 73,058 Reserve and Guard members, and 19,104 civilians. It has access to approximately 379 ships, 1,203 transport aircraft, and a host of contract-supported air, surface, and sealift transportation assets that support the distribution process.

USTRANSCOM is both the Department’s DPO, with responsibility for coordinating and overseeing the DoD distribution system to provide interoperability, synchronization, and alignment of DoD-wide, end-to-end distribution, and the mobility joint force provider,

⁷ A secondary item is an item of supply not defined as a principal item, such as reparable components, subsystems and assemblies, consumable repair parts, bulk items and material, subsistence, and expendable end items, including clothing and other personal gear.

with CCMD authority over the assets, equipment, personnel, and systems that move thousands of personnel and tons of equipment and supplies worldwide in support of ongoing and emerging operations each day of each year.⁸

Per the *Unified Command Plan* (UCP)—which sets forth basic guidance to all CCDRs and establishes their missions, responsibilities, and force structure—USTRANSCOM has several simultaneous roles:

- As the mobility joint force provider, it identifies and recommends global joint distribution sourcing solutions to the Chairman, in coordination with the Services and other CCMDs, from all mobility forces and capabilities, and supervises the implementation of sourcing decisions.
- As DoD's single manager for transportation, it provides common-user (other than Service-unique or theater-assigned assets) and commercial air, land, and sea transportation; terminal management; and aerial refueling to support the global deployment, employment, sustainment, and redeployment of U.S. forces. In executing this role, together with the role of mobility joint force provider, USTRANCOM bridges the Intertheater Leg of the end-to-end materiel distribution pipeline.
- It is DoD's single manager for global patient movement, through the Defense Transportation System, in coordination with the CCMDs and the medical community.
- As DoD's DPO, it coordinates and oversees the Department's distribution system to provide interoperability, synchronization, and end-to-end alignment and develops and implements distribution process improvements that enhance defense logistics and global supply chain management.
- As DoD's global distribution synchronizer (GDS), it synchronizes planning for global distribution operations and in coordination with other CCMDs, the Military Services, and, as directed, appropriate government agencies.

To accomplish its many responsibilities, USTRANSCOM relies on three transportation component commands, and one subordinate command with a significant transportation-related mission, to provide and coordinate specific kinds of materiel distribution functions and services.

⁸ USTRANSCOM's dual roles as both the DPO and the mobility joint force provider are described in the *Unified Command Plan* (with change-1), dated 12 September 2011, Section 18: U.S. Transportation Command (USTRANSCOM).

Air Mobility Command (AMC)



AMC, an Air Force major command, is USTRANSCOM’s Air Force component, providing organic airlift, aerial refueling, air mobility support, and aeromedical evacuation capability. AMC also plans, coordinates, and manages commercial airlift for DoD under the Civil Reserve Air Fleet (CRAF) program during authorized contingencies. CRAF is a cooperative, voluntary program—involving the Department of Transportation, DoD, and U.S. civil air carriers—that augments DoD’s organic airlift capability during a national defense–related crisis.

Military Sealift Command (MSC)



MSC is USTRANSCOM’s Navy Service and sealift component, providing efficient, responsive, and cost-effective sea transportation. MSC uses a mixture of government-owned and commercial ships to provide surge sealift capability for worldwide unit equipment movement; prepositioned sealift of combat equipment, vehicles, and supplies for U.S. combat forces; and sustainment and redeployment sealift for deployed U.S. forces. MSC also supports HA/DR missions as directed. MSC ships operate under four USTRANSCOM business areas: Tanker Operations, Dry Cargo, Strategic Surge, and Afloat Prepositioned Force.

Military Surface Deployment and Distribution Command (SDDC)



SDDC is USTRANSCOM’s Army Service component providing expeditionary and sustained end-to-end deployment and distribution to meet the nation’s objectives. SDDC books, ships, tracks, and conducts port operations for surface movements worldwide by leveraging services from the best of the U.S. transportation industry.

Joint Transportation Reserve Unit (JTRU)



JTRU is USTRANSCOM’s subordinate command, responsible for providing a trained, ready, and relevant operational force to augment active component forces to meet peace and wartime mobility requirements. Comprised of Air Force, Army, Coast Guard, and Navy Reserve personnel, JTRU members are organized, trained, and equipped to seamlessly execute global distribution missions.

SUPPORTED COMBATANT COMMANDS

The supported CCMD can be viewed as being primarily at the “consuming” end of the distribution pipeline. Each geographic CDR is responsible for developing plans and orders in response to the specific taskings they receive for their AOR. The principal plan is the theater campaign plan (TCP), which organizes and aligns resources to achieve the CCMD’s specific objectives related to taskings received, while also integrating steady-state activities. The TCP serves to operationalize the CDR’s strategy. Integrated into the TCP is the theater logistics overview (TLO), which documents the logistics support approach necessary to support the campaign.

The sustainability of the CCMD force and the readiness of the theater logistics capability are continually monitored during the execution of the TCP, and theater logistics planners collaborate with USTRANSCOM to adjust the TLO to ensure the TCP is always logistically supported. The theater distribution plan (TDP) is a detailed theater mobility and distribution analysis designed to ensure sufficient distribution capacity across the theater in support of the TLO and TCP.

With the TCP/TLO/TDP as a foundation, CDRs prepare contingency plans as directed, and operations plans (OPLANS) as required, to address emergent theater requirements. The logistics annex for each contingency plan or OPLAN describes the concept for logistics support to that specific plan. It also defines how a theater distribution system (including assigned forces and equipment, ports, airfields, in-theater storage facilities, airlift, sealift, surface, commercial carriers, host nation support capacity, and existing prepositioned stocks) will be established and maintained to support the CDR’s plans, intent, and theater requirements.

After forces, equipment, and materiel arrive at the POD in support of the CDR, the theater distribution network, guided by the TDP, operates to meet the CDR’s operational priorities and sustainment and distribution needs. Thus, it requires an integrative and collaborative effort by all supporting and supported agencies, organizations, and commanders to effectively achieve end-to-end distribution goals and targets.

SERVICE COMPONENTS

The Services provide assigned forces and equipment to the supported CDR in response to mission taskings. This includes transportation assets assigned to support tactical movement and distribution within the theater. Each Service is responsible for the logistics support of its own forces, but it can augment its organic logistics capabilities through agreements with national agencies or allies or by participating in common, joint, or cross-servicing agreements. The Service component commands are responsible for operating their assigned/attached units within the theater distribution system and per the defined processes and procedures established by the supported CCMD.

Each Service has a host of logistics and distribution equipment, systems, and organizational elements (commands, brigades, units, elements, etc.) it uses to support its Service elements as well as the CCMD. At the intratheater level, these various Service assets and

capabilities are coordinated and synchronized by the CCMD J-4 and an associated subordinate command structure, which includes the following:

- The CCMD's J-4 directs and manages the distribution system in theater while interfacing with the supporting CCMDs, defense agencies such as DLA, operational headquarters, Service organizations, and others.
- The joint deployment and distribution operations center (JDDOC) develops deployment and distribution plans, integrates multinational or interagency deployment and distribution, and coordinates and synchronizes supply, transportation, and related distribution activities. The JDDOC coordinates common-user and theater distribution operations above the tactical level.
- The joint logistics operations center (JLOC) monitors current and evolving theater logistics capabilities to determine their impact on planned operations and coordinates logistics support and services within the theater. This includes maintaining a common operating picture of the location and status of Service component distribution resources and information networks, and tracking materiel en route and within the theater.
- The theater joint transportation board (T-JTB) troubleshoots and resolves transportation issues across the command, such as the allocation of transportation capability among Service components. Procedures for establishing the T-JTB are developed during peacetime to facilitate rapid stand-up and execution under emergency or wartime conditions.

Chapters 2 and 4 of JP 4-09 detail the various distribution-related elements and capabilities each Service has and how those assets are used to conduct coordinated, synchronized materiel distribution operations in support of the CCMD.⁹

GOVERNANCE STRUCTURES

Realizing the importance of materiel distribution to the conduct of successful DoD operations, the Commander, USTRANSCOM, as the DPO,¹⁰ created the JDDE governance structure. This structure consists of three separate bodies that “meet regularly to develop, analyze, coordinate and prioritize distribution-related and force projection, sustainment and redeployment/retrograde operations improvement recommendations and business process and rules for JDDE operations, including operational, institutional and financial processes.”¹¹

⁹ Appendix C contains additional information on materiel distribution initiatives the individual Services have accomplished.

¹⁰ DoDI 5158.06 requires the DPO to establish a governance structure to oversee the collaborative improvement of DoD distribution processes.

¹¹ JDDE Governance Charter, Version 1, 29 January 2013.

DPO JDDE Governance Bodies

These bodies consists of the Distribution Process Owner Executive Board (DEB), Distribution Oversight Council (DOC), and Distribution Steering Group (DSG), each with broad JDDE COI membership. Collectively, these governing bodies track distribution performance and implement policy for overseeing, coordinating, and synchronizing the end-to-end distribution process improvements. Chapter 4, Policy and Governance, describes these governing bodies and includes recommended actions for improving this governance structure to better support DoD materiel distribution goals and objectives.

Supply Chain Executive Steering Committee (SCESC)

While not a JDDE governance body per se, the SCESC does bring together supply chain stakeholders from across DoD to directly support JDDE improvements. Chartered to “review performance measures and provide oversight on the implementation of initiatives designed to drive logistics improvements,” the SCESC includes a Supply Chain Metrics Working Group specifically to “evaluate and make improvement recommendations on the entire body of Enterprise and materiel distribution performance metrics contained in the Supply Chain Metrics Guide.”¹² In addition, the working groups responsible for developing the CIMIP and the *Strategy for Improving Asset Visibility* were chartered under the purview of SCESC.

JDDE SUCCESSES

Since its establishment in 1987, USTRANSCOM has continued to develop and improve its organization, procedures, and operating concepts. Through leveraged partnerships across the JDDE—most notably with DLA—it fosters and exploits enabling functions such as IM and AV to further improve materiel distribution. Collectively, these efforts have yielded remarkable sustained levels of support for mission operations over the past 15 years.

From small domestic operations such as moving and sustaining emergency response equipment and personnel into southern California for wildfire suppression, to providing large, complex distribution planning, management, and service delivery at the height of surge operations in both Operation Enduring Freedom and Operation Iraqi Freedom, USTRANSCOM has consistently provided effective, high-quality materiel distribution support for diverse operations. The following statistics, taken from USTRANSCOM’s *FY2011 Report for Support of Worldwide Exercises, Operations and Contingencies*, show the level of JDDE performance:

- *Airlift*. 35,424 total missions, with 99,467 sorties flown and 2,148,714 passengers and 715,204 short tons of cargo moved.
- *Aerial Refueling*. 31,916 sorties flown with 1,561,064,000 pounds fuel offloaded to 111,362 receivers.

¹² SCESC Charter, 7 October 2011.

- *Sealift*. 19,894,900 metric tons moved (SDDC liner/port ops and MSC cargo).
- *Global Patient Movements*. 26,950 separate movements for 15,445 patients.
- *Operational Support Airlift*. 8,739 missions representing 15,699 requirements with 109,537 passengers and 1,106 short tons moved.

While impressive, these achievements do not mean that USTRANSCOM, DLA, or the JDDE as a whole have arrived at an end-state of materiel distribution optimization. Further improvements are continually being sought and developed. Under the DPO strategic opportunities (DSO) umbrella, the JDDE continues to make materiel distribution improvements to reduce costs, shorten response times, improve service, and increase war-time effectiveness. The most noteworthy JDDE initiative for improving the materiel distribution function in recent years has been the *Campaign Plan for Global Distribution*.

Campaign Plan for Global Distribution

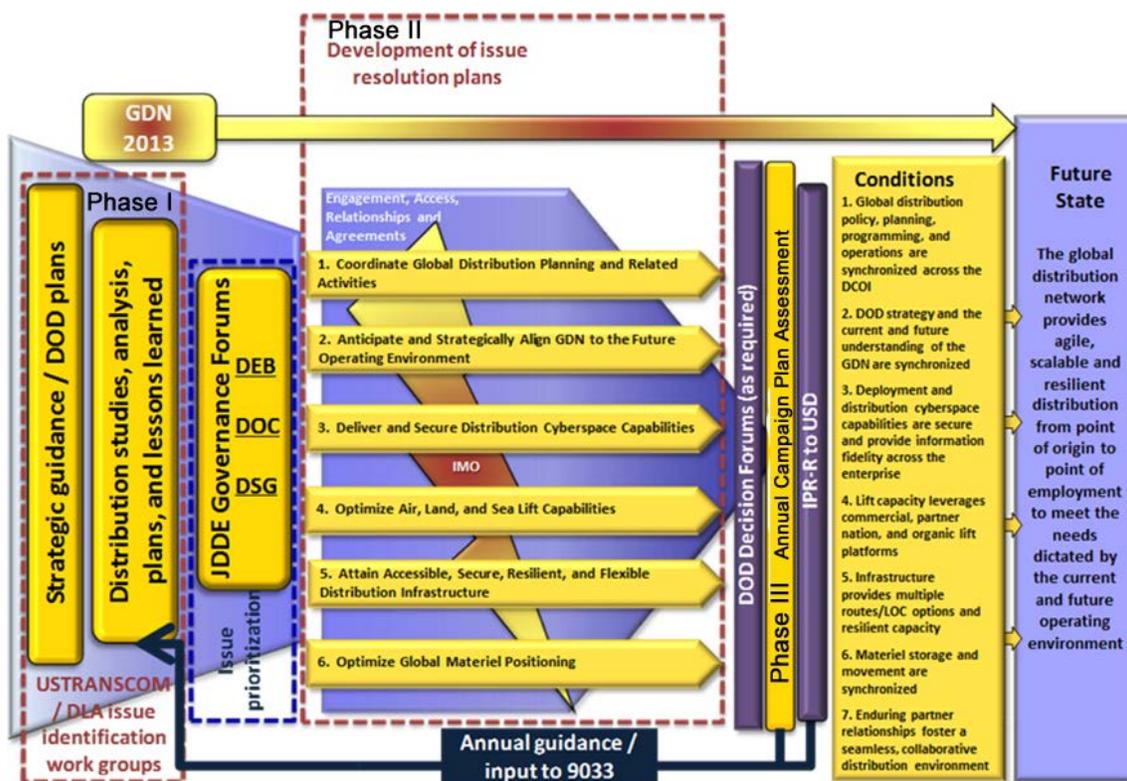
In January 2014, the Undersecretary of Defense for Policy signed the DoD *Campaign Plan for Global Distribution* (CP-GD) 9033. It allows USTRANSCOM to synchronize worldwide distribution planning to establish a more effective and efficient global distribution network (GDN) in support of operations.

CP-GD 9033 can be thought of as a synchronization template for arranging and coordinating all the diverse elements of the GDN during Phase 0, including infrastructure, conveyances, C4 systems, and access rights and agreements. CP-GD 9033 allows USTRANSCOM to fulfill its role as the GDS, coordinating distribution planning and deconflicting distribution and deployment issues across the GDN.

This synchronization template aligns global distribution planning with specific theater plans such as the theater campaign plan, theater posture plan, theater distribution plan, and Service/Agency campaign support plans. Ultimately, CP-GD 9033 aims to achieve a GDN future state that provides fully integrated, agile, scalable, and resilient distribution from point of origin to point of employment. It will seamlessly cross the Intracontinental, Intertheater, Intratheater, and Tactical Legs in support of all operating needs. CP-GD 9033 works toward this future state by focusing on six lines of effort (Figure 1-2).

CP-GD 9033 is reviewed and updated annually using a three-phase process. Phase I is Issue Identification and Prioritization. During this phase, the Distribution Community of Interest (DCOI)—consisting of the CCMDs, Services, defense agencies, other government agencies such as the General Services Administration (GSA), and commercial partners—identify issues representing gaps or capability shortfalls in the GDN. The DCOI vets and prioritizes these issues using criteria set in CP-GD 9033.

Figure 1-2. Campaign Plan for Global Distribution Framework



In addition to prioritizing the annual list, the DCOI makes recommendations to USTRANSCOM on which issues to advance to the Issue Resolution Planning (Phase II) for that year—typically the top 10–12 issues. During this phase, the office of primary responsibility (OPR) for each issue, supported by the appropriate stakeholders from across the DCOI, prepares a detailed plan to resolve the issue, including a timeline for execution. The Issue Resolution Phase concludes with the annual CP-GD 9033 Synchronization Seminar, where the DCOI, led by USTRANSCOM, reviews the draft issue resolution plans (IRPs), makes any necessary adjustments, and synchronizes execution plans across the enterprise.

Phase III, Plan Assessment, is ongoing throughout the year. All active IRPs are assessed quarterly for progress. These quarterly assessments inform an annual in-progress review, where USTRANSCOM reports to the Secretary of Defense on the overall capability/resiliency of the GDN, new issues identified via the current Phase I and II iteration of CP-GD 9033, top priority distribution issues and recommended corrective actions, emerging issues driving changes to the global distribution environment, and recommended updates to the plan.

Since its inception in 2013, CP-GD 9033 has become a lynchpin of the joint strategic planning process by providing a common framework and a repeatable, yet flexible, process to proactively “troubleshoot” the JDDE and achieve synchronized global distribution

planning in support of the warfighter. The annual application of CP-GD 9033 shortens issue resolution times and enables USTRANSCOM to be more proactive in its approach to resolving capability gaps and single points of failure within the GDN.

USTRANSCOM J4-L Division

After assuming the role of DPO in 2003, USTRANSCOM concentrated its efforts on improving enterprise-wide distribution performance. To this end, USTRANSCOM J5/J4 started the Distribution Process Owner Strategic Opportunities (DSO) program in partnership with DLA and GSA. Since 2009, the DSO team has developed and implemented enterprise solutions that have improved service levels and avoided substantial costs. To date, DSO initiatives pioneered by the USTRANSCOM J4-L Division have avoided \$1.56 billion in costs while integrating key USTRANSCOM and DLA processes to achieve operational benefits across the JDDE.

DLA-USTRANSCOM (DLA-T) Division

In 2012, DLA stood up the DLA-USTRANSCOM (DLA-T) Division under the Logistics Operations Directorate. DLA-T's charter requires it to represent the DLA Director in providing enterprise integration support to USTRANSCOM and the JDDE structure. DLA-T provides on-site representatives to USTRANSCOM to support current operations and future initiatives, including integration planning, to optimize the supply, distribution, and transportation functions. DLA-T also seeks to decrease direct materiel operation costs, reduce inventory, improve customer service, and achieve DLA full audit readiness.

Rapid Deployment Initiative (RDI)

Recent operations such as Operation United Assistance showed the need for closer linkages between USTRANSCOM joint task force–port opening (JTF-PO) elements and DLA support team (DST) deployable capabilities. To meet this need, DLA and USTRANSCOM explored ways to permit the DLA DST to deploy more rapidly under USTRANSCOM authority while still preserving the CCDR's ability to request DLA capabilities through the request for forces (RFF) process. The intent of RDI is to provide an option for DLA to deploy essential, initial-response personnel very quickly in support of CCMD requirements, without restricting the use of other DLA deployable capabilities. RDI will permit greater speed and more flexible responses to meet CCMD requirements.

OTHER MATERIEL DISTRIBUTION–RELATED INITIATIVES

In an effort to integrate and align all aspects of supply chain operations and improve materiel support for the full spectrum of DoD operations, the Department has recently introduced several important supply chain initiatives. Many have directly improved materiel distribution performance, especially in view of the close linkages between AV, IM, and effective materiel distribution operations. Effective IM and AV processes work synergistically to physically and temporally shorten the materiel distribution pipeline by having the necessary materiel on hand and locating it closer to the point of need, while

providing the ability to identify and track it from shipment to delivery. Two key initiatives are the *Strategy for Improving Asset Visibility* and CIMIP.

Strategy for Improving Asset Visibility

In 2014, the Department published the *Strategy for Improving Asset Visibility* to establish a framework for identifying, documenting, monitoring, and sharing AV improvements. The framework also facilitated collaborative identification of AV improvement opportunities such as radio frequency identification (RFID) and item-unique identification enabled by automatic identification technology (AIT).

The 2015 edition of the strategy builds on the 2014 version and includes specific AV improvement opportunities for the near term, including enterprise use of passive RFID (pRFID), intratheater movement, visibility of data on asset condition, data management and system standardization, and training and education on existing AV data sources. It also focuses on improving end-to-end integration of AIT with both legacy and emerging automated information systems (AISs) and integrating data captured via AIT with existing business and operational processes.

In addition to the strategy, several related AV initiatives and capabilities have recently been initiated to enhance the distribution function.

INTEGRATED DATA ENVIRONMENT/GLOBAL TRANSPORTATION NETWORK CONVERGENCE (IGC)

Developed through the USTRANSCOM-DLA partnership, IGC is a system that merges USTRANSCOM's Global Transportation Network (GTN) with DLA's Integrated Data Environment (IDE) to give the joint logistics community an integrated set of networked, end-to-end visibility, deployment, and distribution capabilities. IGC receives and integrates data from Service logistics systems and furnishes data to many common operating picture and visibility systems currently used by Service and Defense component logisticians.

In 2014, IGC was integrated with DLA's AV system, known as Total Asset Visibility (TAV), and now provides global visibility of assets to the warfighter in all classes of supply combined with query and reporting capabilities to facilitate enhanced logistics decision making. The integration of AV into IGC gives DoD logisticians a single portal for viewing integrated supply and transportation data, rendering a TAV level never before available.

CP-GD 9033—THEATER IN-TRANSIT VISIBILITY (ITV)

AV is an integral part of CP-GD 9033 because distribution-related data are so critical for timely and effective theater-level decision making. USTRANSCOM, through its Outreach Program, seeks to improve theater ITV information support to the CCMDs while

aligning ITV processes, policies, and systems. The Outreach Program for ITV has three focus areas:

- The synchronization of CCDR theater distribution plans and ITV requirements with CP-GD 9033
- The improvement of ITV levels via identification and analysis of existing data and systems gaps
- The promotion of IGC as the system of record for ITV information.

SERVICE-SPECIFIC AV INITIATIVES

Service-specific AV initiatives include the following:

- The U.S. Marine Corps' use of Non-nodal In-transit Visibility, which provides near-real-time visibility of sustainment cargo during the tactical-level, battlefield distribution process. Better ITV has saved \$1.4 million annually.
- The U.S. Air Force's use of Global Enterprise Tracking, which uses real-time location systems technology to track aircraft and critical assets as they move through the depot maintenance process.
- The U.S. Navy's automation of Littoral Combat Ship containers, which uses a pRFID-based inventory system to perform fast and accurate inventories of mission module containers.

As these examples show, AV and ITV stakeholders now have the ability to not only answer the question, "Where's my stuff?" but also provide the location of units, give the status of requisitions, and identify the sustainment cargo in the distribution pipeline at a given point in time.

Comprehensive Inventory Management Improvement Plan (CIMIP)

Published by OSD in 2011, the CIMIP was developed to guide and direct DoD's collective efforts to improve inventory management in support of the warfighter. The plan included specific objectives and targets for improving demand forecasting and reducing or terminating unneeded orders to ensure inventory accurately reflects actual needs. Other objectives included enhancing methods for determining the amount of inventory to retain, ensuring the timely review and disposal of excess inventory, and improving inventory management and resource investment decisions. Having the right inventory on hand in the right quantities enables better materiel distribution performance.

CIMIP has met with considerable success since its initial publication. In fact, total DoD secondary item inventory for FY15 was \$93.4 billion—down \$11.2 billion from the high point of \$104.6 billion in March 2012. FY15 on-hand excess inventory was \$6.8 billion or 7.3 percent of total secondary item inventory—down \$3.5 billion overall from March 2012. Additionally, due-in potential future excess inventory for FY15 was

\$303 million or 3 percent of total on-order inventory, for a \$1 billion overall reduction since FY09. Reductions in total inventory, and specifically reductions in excess on-order inventory will lead to less materiel moving through the distribution pipeline. CIMIP's most important outcome has been to establish a new culture in the Department of "Don't buy what is not needed" and "Don't keep what is not used."

CONCLUSION

The JDDE and DoD materiel distribution process is complex but highly effective. The distribution pipeline framework explains the various distribution legs and identifies the entity (Service components, DLA, USTRANSCOM, and CCMD) with primary responsibility for the proper functioning of each leg. The DPO coordinates, sustains, and improves the end-to-end distribution process but does not have end-to-end operational control. It must rely on the integrated and coordinated actions of other JDDE COI stakeholders to realize the full potential of the distribution process. The JDDE governance structure has a key oversight role in making the distribution function more integrated and efficient and continually improving its ability to meet the needs of the warfighter.

Chapter 2

Metrics and Performance

NEED FOR IMPROVED ASSESSMENT OF THE DISTRIBUTION FUNCTION

Despite the undeniable and impressive operational success of the DoD supply chain in supporting the warfighter,¹ performance gaps continue to exist in the area of adequately measuring, from an enterprise perspective, the effectiveness and efficiency of the end-to-end distribution process that puts the proper materiel in the hands of our troops when and where it is needed. There is no shortage of DoD distribution metrics today. As indicated in Appendix D, OSD has published *The Supply Chain Metrics Guide*, containing a broad suite of metrics selected to assess the effectiveness and efficiency of the entire DoD supply chain, including 11 dedicated materiel distribution metrics. Additionally, OSD has developed an enterprise-wide Transportation Dashboard Tool that includes key performance and cost metrics related to distribution. The challenge for DoD has always been in selecting a manageable subset that provides a true end-to-end picture of the distribution process and then modifying them to provide the fidelity of information needed to affect beneficial change and improvements in distribution at the enterprise level. Both GAO (externally)² and the JDDE COI itself (internally)³ have cited the need for DoD to establish an improved materiel distribution performance measurement framework. DoD must

¹ From the testimony of Mr. Alan F. Estevez, then Principal Deputy Under Secretary of Defense for Acquisition Technology and Logistics before the House Oversight and Government Reform Committee: on GAO's 2015 High Risk List, dated 11 Feb. 2015: "The ability of DoD's supply chain to support these war-fighters is our most important measure of success. Most notably today, DoD logisticians are key enablers to simultaneously executing the sustainment of forces in Afghanistan, supporting the war on ISIL, and providing support in the mission to control Ebola. At the height of operations in Afghanistan, we provided 1.1 million gallons of fuel a day for both U.S. and coalition forces while feeding 435,000 meals a day to the U.S. Service personnel and civilians on the ground, as well as delivering the needed sustainment in medical, construction materials, clothing, and spare parts. We also rapidly fielded more than 12,000 mine-resistant ambush-protected (MRAP) vehicles to Afghanistan to protect our forces as they performed their mission, and we sustained the readiness of these vehicles in austere conditions at levels over 90%. In addition to delivering warfighter sustainment, we executed the drawdown of forces, equipment, and supplies. From the high water mark in January 2012 to January 2015, we reduced over 38,000 vehicles and 27,000 containers of supplies and equipment, and closed or transferred 343 U.S. bases. We donated \$284 million (depreciated value) of excess property to the Afghan government."

² GAO letter to Mr. Paul Peters, Acting Assistant Secretary of Defense for Logistics and Materiel Readiness, updating GAO's High-Risk List actions, dated 20 Oct. 2014, which noted: (1) DoD's current means for assessing performance of the global distribution pipeline is limited and not comprehensive, (2) DoD does not consistently meet established distribution performance targets and (3) data reliability problems exist for some of DoD's metrics, limiting their usefulness in monitoring distribution performance.

³ DLA and USTRANSCOM's Joint Deployment and Distribution Enterprise Capability Gaps assessment update, dated 21 Nov. 2013, which noted that DoD's "distribution performance metrics are inconsistent, unclear, and insufficient. There are insufficient shared data sets, collaborative capability, or common metric scorecards. Different stakeholders require various levels of precision. No standard metrics or methods exist across supply chain organizations to evaluate performance."

be able to measure performance with certainty across the enterprise before it can affect meaningful improvements in the distribution function.

METRICS DEVELOPMENT FRAMEWORKS

To create a suite of enterprise materiel distribution performance metrics, the Metrics and Performance Sub-Working Group (MPWG) began with an evaluation of two well established metrics development frameworks—the *Supply Chain Metrics Guide* Metrics Analytical Framework and the JDDE Performance Metrics Framework for Sustainment Distribution, or PMF_{SD}.

The Supply Chain Metrics Group (SCMG) used the Metrics Analytical Framework to categorize the metrics found in the guide and illustrate and manage their correlations and interdependencies. The framework specifies the desired performance attributes required for effective supply chain management and links each of the guide's 34 existing enterprise and materiel distribution metrics into a comprehensive supply chain measurement tool. The guide's metrics, grounded in a rigorous analytical framework that enables them to be used in synthesis with each other, permits the SCMG to monitor the efficiency and effectiveness of the entire DoD supply chain.

The PMF_{SD} is a report published by Computer Sciences Corporation in September 2006 for USTRANSCOM. The metrics development framework included in this report is compelling for its detailed focus on the warfighter. The authors extensively interviewed more than 200 personnel at the strategic, operational, and tactical levels, across each of the Services and CCMDs, to determine the performance attributes and metrics that best describe materiel distribution effectiveness from the warfighter's perspective.⁴

MATERIEL DISTRIBUTION PERFORMANCE ATTRIBUTES

In examining both frameworks, the MPWG found considerable similarity in their materiel distribution performance attributes. Leveraging this similarity, the group distilled the best attributes from both frameworks and used those as the analytical foundation for evaluating existing metrics as well as developing new ones. The performance attributes used were responsiveness, reliability, information visibility, and efficiency/cost. Against these attributes, the group was able to evaluate all 34 enterprise and materiel distribution metrics currently in the guide.

After a detailed review, the group decided on a suite of five metrics that could be used to measure enterprise materiel distribution performance. In selecting just five metrics, the group not only matched the best metric to each required performance attribute, but also considered four other essential elements. The metrics had to be

- manageable in number via existing governance structures,
- actionable at various levels (tactical, operational, and strategic),

⁴ Both the Metrics Analytical Framework and the PMF_{SD} are discussed in detail in Appendix D.

- derived from existing high-quality data sources, and
- inclusive such that materiel distribution processes are measured end-to-end while revealing performance gaps and suggesting root causes and solutions for closing them.

In addition to comparing candidate metrics with the performance attributes and these other essential elements, the group also surveyed their membership’s parent organizations to determine the current metrics actually perceived as having the most operational value from a user perspective.

MATERIEL DISTRIBUTION ENTERPRISE METRICS SUITE

The group selected two metrics from the guide that measure responsiveness and one from the guide that measures reliability (this metric was modified slightly to provide a more pure measure). To these they added one new metric to capture efficiency/cost. While the frameworks require a metric to address information visibility, the effort to develop one was seen as more suitable for the Data Accuracy LOE, therefore the metric that assesses that attribute, known as the Data Quality Compliance (DQC) metric, is discussed in Chapter 3. Table 2-1 lists these metrics, known as the materiel distribution Enterprise Metrics Suite (“the suite”).

Table 2-1. The Suite’s Metrics

Metric	Short title	Attribute measured	Source
Time definite delivery	TDD	Responsiveness	<i>Supply Chain Metrics Guide</i>
Customer wait time for organizational maintenance	CWT _{OM}	Responsiveness	<i>Supply Chain Metrics Guide</i>
Wholesale perfect order fulfillment (less time component)	WPOF(-)	Reliability	<i>Supply Chain Metrics Guide</i> with modification
Data Quality Compliance	DQC	Information Visibility	DAWG
Finished product logistics cost	FPLC	Efficiency/Cost	MPWG

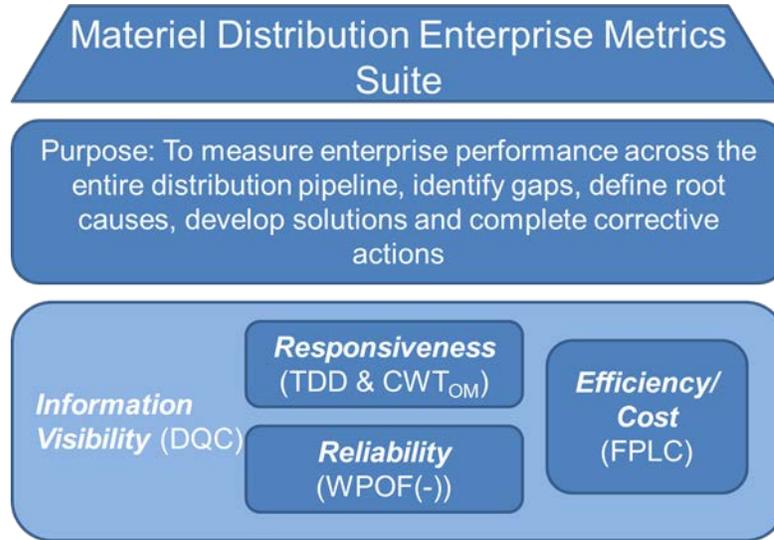
Note. DQC is discussed in Chapter 3, Action B-3.

As shown in Table 2-1, both TDD and CWT_{OM} measure responsiveness, or the ability of the distribution process to meet established timeliness targets from both the distribution provider and customer perspectives. WPOF(-) measures reliability, or the ability to satisfy the customer’s demand to receive materiel in the right quantity, with sufficient quality, and with proper documentation.

The new efficiency/cost metric FPLC measures the discrete cost of specific distribution chain processes required to deliver specific performance outcomes (such as putting materiel in the hands of the warfighter). Comparing FPLC cost elements and segments over time, as well as with each other, will yield insights into the relative efficiency of the distribution function. Both DQC and FPLC will require a development effort by the JDDE COI before they can be fully implemented. Figure 2-1 shows how all five of The suite’s

metrics, and the performance attributes they represent, are integrated into an enterprise distribution process measurement tool.

Figure 2-1. Interrelationship of The Suite's Metrics



Selecting only five metrics for the suite does not imply that the remaining metrics in the guide are not viable. Many of the guide’s metrics either measure other parts of the supply chain or simply do not meet all of the criteria the MPWG used to evaluate candidate metrics. For example, they are not inclusive enough to measure the end-to-end process at an enterprise level, they are “diagnostic” in nature rather than true “outcome” measures, or they are not perceived as having significant operational value by the JDDE COI. The group is confident that its efforts have resulted in the identification of the metrics most suitable for an enterprise view of the end-to-end distribution process, and these metrics constitute the suite.

Implementation of the suite will provide an effective means for measuring materiel distribution performance across the entire distribution enterprise and identifying materiel distribution performance gaps. The suite will also serve as a starting point for undertaking root cause analysis, as well as developing, implementing, and monitoring corrective actions for materiel distribution improvement. It gives the JDDE COI vetted metrics that are inclusive, manageable, analytically sound, actionable, and directly related to the key materiel distribution performance attributes of responsiveness, reliability, information visibility, and effectiveness/cost.⁵

ACTIONS FOR METRICS AND PERFORMANCE SUCCESS

The remainder of this chapter describes eight actions that must occur to fully develop, adopt, and realize the maximum benefit from the metrics in the suite. Each is designed to achieve a specific distribution performance goal that is described together with the action.

⁵ Appendix D details the two metrics development frameworks and fully describes each of the suite’s metrics, including how they were evaluated and developed and how they should be applied.

Also described are any DoD performance or measurement process gaps related to the goals and actions. The table following the narrative includes an estimated target date for action completion.

Action A-1: Develop a Suite of Materiel Distribution Enterprise Metrics to Measure End-to-End Performance of the DoD Distribution Process

Accurately measuring the end-to-end performance of the materiel distribution function has been an ongoing priority for DoD. The Department has many distribution metrics, and the JDDE COI creates and uses several metrics at various levels to help their organizations better understand the performance of the distribution function and make key decisions. At a minimum, USTRANSCOM, AMC, SDDC, DLA, and all the Services know and use distribution metrics. While some are well known, intended to measure enterprise-level performance, and widely shared across the JDDE, others are designed for internal organizational use.

As discussed in the opening section of this chapter, with so many materiel distribution metrics in use—either formally or informally—the challenge for the JDDE COI has been to identify a subset of metrics that can adequately measure the distribution function at the enterprise level. That subset must include metrics that are manageable (the right number—not too many, not too few), are actionable (offering the ability to make informed management decisions at various levels based on the metric values), are supported by high-quality data (analytically reliable and frequently updated/refreshed from trusted sources), and can be used to measure end-to-end performance across the distribution enterprise.

This action seeks to develop a manageable suite of distribution metrics that can be used by the JDDE COI to measure end-to-end distribution process performance. While TDD, CWT_{OM} and WPOF(-) definitions and standards already exist, additional standards will need to be developed per Actions A-2 and A-4. DQC and FPLC will require a “ground up” development effort.

Goal	Recommended action to meet the goal	Target date
A manageable set of materiel distribution performance metrics populated from quality data sources, providing actionable information, and offering the JDDE COI a complete view of end-to-end distribution performance	Develop and adopt TDD, CWT _{OM} , WPOF(-), DQC, and FPLC as the materiel distribution Enterprise Metrics Suite for use in measuring end-to-end DoD materiel distribution performance.	6 months from MDIP approval

Action A-2: Expand CWT_{OM} and WPOF(-) Measurement to the List of 111 Integrated Distribution Lanes (IDLs) and Lower Levels as Appropriate

CWT_{OM} is a “customer-facing” metric that measures the total elapsed time between the submission of an order by organizational maintenance and the receipt of that same order. CWT_{OM} indicates how responsive the DoD supply chain is from an end-user (unit-level) perspective by linking its performance to the operational availability of weapon systems. CWT_{OM} includes both back order time and local (retail) supply chain time, so it actually measures overall supply chain performance as opposed to just the materiel distribution function. Despite including additional elements of the supply chain, CWT_{OM} is still seen as a valid distribution process metric because it is the principal measure of responsiveness from the customer’s point of view.

WPOF(-) evaluates wholesale supply system performance in satisfying customer demands for materiel in the correct quantity, with sufficient quality, and including all proper documentation. Thus, WPOF(-) indicates how well the wholesale supply > order management > distribution system chain is performing together, to provide the right materiel, in the right quantities, and with the right documentation.

Current CWT_{OM} standards have been established by each of the Services: Army, Navy, and Marine Corps, 15 days, and Air Force, 7.5 days. While serviceable, these standards are too static and do not consider specific transportation modes (such as military air) or shipment destination location (such as a country or region), as with TDD. TDD standards have already been established for each of 111 defined IDLs, and USTRANSCOM is working to define a list of 2,500 distribution stream standards, which will add specific physical locations (a single DLA depot, for example) to an IDL. Stream standards will provide significantly more precision of measurement, enhance customer responsiveness, and offer a greater potential for more targeted distribution process improvement.

This action seeks to expand use of CWT_{OM} and WPOF(-) such that they have established standards and applicability at more granular levels similar to those now used for TDD. TDD standards have already been established for each of 111 defined IDLs, and USTRANSCOM is working to define a list of 2,500 TDD distribution stream standards. This effort should greatly accelerate the development of CWT_{OM} and WPOF(-) standards at these same levels.

Goal	Recommended action to meet the goal	Target date
Greater measurement precision for each of the distribution reliability and responsiveness measures to facilitate distribution process improvements	Investigate expanding the use of CWT _{OM} and WPOF(-) at more granular levels of measurement as is currently being planned for TDD. Measurement against standards established for all 111 current IDLs is the minimum goal but measuring down to even lower levels, such as the list of 2,500 defined distribution streams, should be explored.	6–9 months from MDIP approval

Action A-3: Expand CWT at the Unit Level and TDD to Other Classes of Supply

Presently, CWT is limited to class IX items. TDD covers only wholesale requisitions for limited classes of supply, but it still serves as a valuable metric for assessing the various segments of the materiel distribution pipeline—especially supplier, transportation, and theater distribution. DoD has long considered the possibility of expanding both CWT and TDD to other classes of supply. Doing so would deepen the utility of both metrics by expanding their use and relevance beyond the enterprise level. Use of both metrics below the enterprise level would add value to specific entities in the JDDE COI (the Services, DLA, and USTRANSCOM, for example) and begin to drive targeted distribution process improvements and point-specific distribution solutions.

This action seeks to expand the use of TDD and CWT at the unit level for other classes of supply as appropriate, to enhance the measurement of distribution effectiveness and provide a stronger basis for distribution process improvements. Although USTRANSCOM has done some research in to developing TDD and unit level CWT standards for “non-traditional” classes of supply a significant development effort is still required.

Goal	Recommended action to meet the goal	Target date
Broader and deeper distribution effectiveness measurement via an expanded use of select metrics outside the traditional classes of supply to which they have historically applied. Add metrics value at levels below the enterprise to create a basis for the development of specific distribution process improvements and solutions	Investigate expanding the use of TDD and CWT (at the unit level) to select classes of supply other than those traditionally measured by those metrics.	12–18 months from MDIP approval

Action A-4: Split TDD into Two Sub-Measures: One Measuring Capability Standards Established by Distribution Providers and One Measuring Performance against Specific Customer Operational Needs

Current TDD standards are a compromise between the distribution provider’s capability and the customer’s operational needs. This dichotomy occurs because both providers and customers provide input for setting the standards at the annual TDD Conferences. Because providers are driven by their current distribution capabilities and those specifications contained in their contracts, and customers are driven by their desire for enhanced operational readiness, the result is often a set of compromise standards that do not address the goals of either side very well.

The JDDE COI would be better served by a TDD Framework which evaluates provider capability standards against responsiveness expectations driven by customer operational need goals. Each community, provider and customer, should develop its own TDD standards: capability standards by stream for the providers and goals based on the operational needs of the customer community (defined by service, CCMD, and requisition priority).

This action seeks to bifurcate the measurement of TDD into capability standards by stream for the provider community and goals based on actual operational needs of the customer community. Using two measures instead of one would render a more balanced view of distribution effectiveness that accounts for the capabilities and operational needs of both communities. A bifurcated TDD measurement will require a significant development effort from the customer community, especially the CCDRs. USTRANSCOM has already made progress in developing capability provider standards for all 2,000 distribution streams. Additionally, the Joint Staff J4 is currently leading the services and CCMDs in the development of operational need goals.

Goal	Recommended action to meet the goal	Target date
A more balanced view of distribution effectiveness through the development and use of two TDD sub-measures; one based on provider capability standards and one that establishes goals based on customer operational needs. Comparing and contrasting the two measures over the same IDLs and streams should lead to greater effectiveness, process improvements, and higher levels of customer satisfaction	Continue existing efforts to develop a TDD Framework based on two sub-measures: capability standards by stream for use by the distribution provider community and operational need goals based on specific requirements of the customer community (service, CCMD, and requisition priority).	6–9 months from MDIP approval

Action A-5: Evaluate the Appropriateness of Continuing to Apply the 85 Percent Target for TDD Performance at the Existing IDL Level

TDD performance is currently assessed against standards developed for each of the existing 111 IDLs. These standards are created by JDDE consensus at the annual TDD Conference attended by the CCMDs, USTRANSCOM, AMC, SDDC, DLA, GSA, the Joint Staff J4, the Military Services, and others. The DSG then reviews and approves the IDL standards. Once the standards are established, the performance goal is to have 85 percent of all requisitions transiting that IDL meet the TDD standard.

Although the IDL TDD standards are developed by consensus, the performance goal of having 85 percent of all requisitions meet those standards is not. The 85 percent target appears to have simply been “set” for quite some time with little justification or knowledge within the JDDE COI of its origins or rationale. However it was established, many in the JDDE COI continue to question the appropriateness of the 85 percent target—because the Department consistently falls short of it.

Once actions are taken to increase the fidelity and granularity of TDD as recommended in Actions 3 and 4, the coarseness of measurement that currently may restrict TDD from meeting the 85 percent standard could largely be remedied. After these TDD measurement refinements are in place and more performance data are gathered, the appropriateness of the 85 percent performance standard can be reexamined.

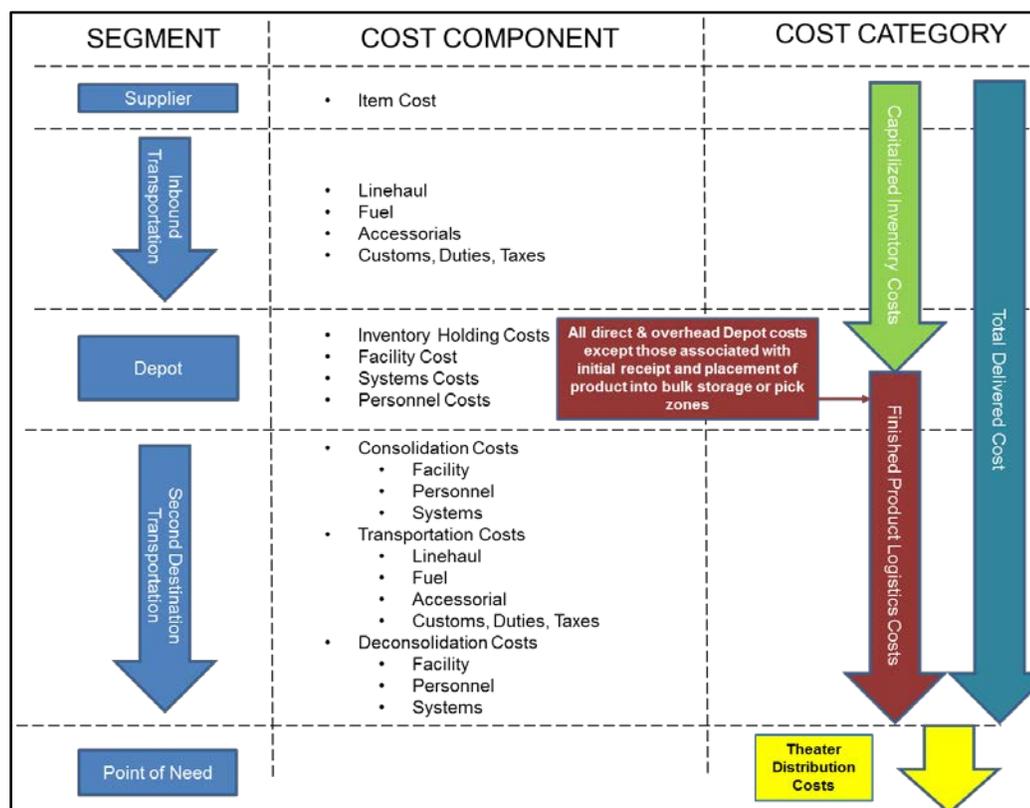
This action seeks to investigate the appropriateness of the 85 percent TDD performance standard. Any such determination, or potential adjustment to the standard (up or down), should be based on a thorough review of empirical data and a desire to balance available resources with realistic performance capabilities and expectations.

Goal	Recommended action to meet the goal	Target date
TDD performance measurement against realistic standards, developed from and supported by empirical data, that balances resource availability with the utility of incremental performance gains	Investigate the appropriateness of continuing to apply the 85 percent target for TDD performance at the existing IDL level or adjusting it to better achieve sustained successful performance. Once sufficient performance data can be collected on the extension of TDD to the stream level and the expansion of TDD into two sub-measures for distribution providers and customers (Action 4), the appropriateness of the 85 percent performance standard should be reevaluated against this more granular level of measurement.	12–18 months from MDIP approval

Action A-6: Adopt FPLC as the Materiel Distribution Enterprise Cost Metric

At the enterprise level, cost and efficiency are perhaps the most difficult attributes of materiel distribution to measure. The often long and complex supply chains prevalent within DoD require measures that track individual component costs against their own historical standards as well as those that highlight each component's performance relative to other components in the chain or across whole segments of the chain. Figure 2-2 shows the complicated interrelationship of various costs up and down the supply chain.

Figure 2-2. Supply Chain Costs



FPLC can be defined as all costs incurred after the entry and initial placement of finished products into the warehousing and distribution chain, until delivery of these items to the point of acceptance—the point where the responsibility of the supply system ends in the theater. FPLC is represented by the maroon arrow in the figure and comprises all costs involved in actually delivering a product to the customer when it is sold or issued. Costs upstream of initial entry into the warehouse/distribution system (including the actual cost of the item and the inbound transportation costs to get it into the DoD system) are considered capitalized inventory costs.

FPLC includes all logistics activity necessary to ensure delivery of ordered materiel to the point of acceptance, such as the following:

- Inventory storage, warehousing, and other handling costs, including lateral redistribution costs
- All second destination transportation costs
- Consolidation and deconsolidation costs
- Customs fees, tariffs and duties, currency changes, and port charges
- Costs for any supporting systems, such as warehouse management systems, inventory management systems, and transportation management systems that are ascribable to these logistics activities.

This action seeks to establish FPLC as the materiel distribution enterprise cost metric that will be used with the responsiveness metrics, TDD and CWT_{OM} , the reliability metric, WPOF(-), and the DQC metric to measure enterprise distribution performance. Commercial definitions of FPLC exist today based on Generally Accepted Account Practices (GAAP) and some of these might be leveraged for DoD’s purposes. The cost components that make up FPLC are known, as well as the data owner for those components (most will come from DLA and USTRANSCOM sources). However, much work is still required to access this data and link it together at the transaction level. Action B-5 is a related action that addresses the quality of data elements underpinning FPLC.

Goal	Recommended action to meet the goal	Target date
An enterprise metric for inclusion in the suite that measures the efficiency/cost of the materiel distribution function	Develop and adopt FPLC as the materiel distribution enterprise cost metric. Create and manage a FPLC metric development plan that identifies the required data, the organizations responsible for sourcing that data, and the linkages needed to tie the data together at the transaction level to create the metric. Include FPLC under the existing SCMG review and governance structure.	18–24 months from MDIP approval

Action A-7: Require a Periodic Review of the Materiel Distribution Enterprise Metrics Suite by the JDDE Governance Bodies

The JDDE governance structure, chartered by USTRANSCOM as the DPO, is collectively tasked with tracking distribution performance and implementing policy for overseeing, coordinating, and synchronizing end-to-end distribution process improvements. The focus of the DEB, the most senior body, is strategic and centered on the review and approval of strategies and initiatives that guide the present and future actions of the JDDE COI. The DOC's focus is on operational improvement of the JDDE. It considers standards, processes, policies, business rules, improvement initiatives, and information technology solutions that support the JDDE. The DSG has a tactical focus, seeking out and evaluating JDDE improvements using enterprise performance measures that assess the overall effectiveness and efficiency of joint distribution-related activities.

Of the three governance bodies, only the DSG appears to be specifically tasked with reviewing performance measures to identify potential areas for JDDE improvement. Yet there is little evidence that any of the bodies in the JDDE governance structure are regularly monitoring materiel distribution metrics as part of their oversight and process improvement responsibilities.

This action seeks to establish a requirement for each body in the JDDE governance structure to regularly review the materiel distribution Enterprise Metrics Suite as part of its distribution process oversight and improvement role. Once the metrics in the suite have been fully developed and are in use, Action C-2 should be taken to change the directive that will result in an update to the JDDE Governance Charter requiring periodic review of the metrics in the suite.

Goal	Recommended action to meet the goal	Target date
Regular programmatic reviews of the materiel distribution Enterprise Metrics Suite by each body in the JDDE governance structure as part of their oversight and process improvement responsibilities	Adjust the JDDE governance structure charter and operating procedures to require regular reviews of the materiel distribution Enterprise Metrics Suite by all bodies during their normal quarterly, semi-annual, or annual meetings.	6–12 months from MDIP approval

Action A-8: Investigate Publishing the Materiel Distribution Enterprise Metrics Suite on OSD’s Existing SCMG Metrics Website, or Other Appropriate Web-Based Portal, for Access and Use by the JDDE COI

Development and refinement of the materiel distribution Enterprise Metrics Suite is of little use if the entire JDDE COI cannot access the metrics. These metrics will form the basis for evaluation and reporting of distribution performance, as well as for initiating process improvements, so they must be collected and published in a single location.

The current SCMG metrics website is not presently accessible to the entire JDDE COI and does not provide enterprise metrics at multiple levels of aggregation to support users at different levels. Therefore, the JDDE governance structure needs to investigate how the metrics could be aggregated at various levels to support the interests and operational view of key members of the JDDE COI and how those members could best gain access to “their” level of distribution metrics.

At a minimum, the metrics in the suite should aggregate data at the region/country, CCMD, and individual Service levels. Other appropriate aggregations and rollup categories should be developed and included in the future as required. The metrics should also be stratified by class of supply, IDL, and eventually by distribution stream once each of these elements are more fully developed in accordance with the other recommended actions.

This action seeks to investigate how OSD’s existing SCMG metrics website, or another appropriate web-based portal, could be used to publish (and make accessible) the metrics in the Metrics Suite at levels of aggregation suitable to support the varied needs of key members of the JDDE COI.

Goal	Recommended action to meet the goal	Target date
Publication of all metrics in the suite, including aggregations of each metric that meets the needs of key members of the JDDE COI	Step 1. Determine the most appropriate website or portal to display the metrics in the suite. The website should be accessible to key members within the JDDE COI requiring metric performance information.	9–12 months from MDIP approval
	Step 2. Publish metrics by class of supply, IDL, and eventually distribution stream once these are more fully developed. Metrics should also aggregate data at the region/country, CCMD, and Service levels at a minimum to permit tailored views supporting local decision-making; other appropriate rollup categories should be developed in the future which support the data needs of key JDDE COI members.	

Chapter 3

Data Accuracy

CURRENT DATA QUALITY ENVIRONMENT

JDDDE capability and agility are enabled by clear and concise information about materiel distribution enterprise efficiency and effectiveness. Such information requires a data infrastructure designed to support continual improvements in data quality and reliably deliver consistent, high-quality data to the enterprise for performance measurement, root cause analysis, and decision-making support.

Several DoD organizations, from the military Services through DLA and USTRANSCOM to the combatant commands, collect and report materiel distribution performance data. The current *Standards for Internal Control in the Federal Government* require Agencies to establish control activities that monitor performance measures and indicators.¹ For DoD to comply with the standards, it must validate its existing internal controls and perform a gap analysis to determine where internal controls are absent or do not comply with existing guidance and regulation. It must also ensure alignment of internal controls at all levels and across the enterprise so the collective needs of the JDDDE are served.

A review of DoD internal controls was recently conducted using a GAO questionnaire completed under GAO-15-226.² The questionnaire identified both data quality and internal control issues for many DoD systems and processes supporting materiel distribution performance measurement.³ USTRANSCOM, for example, could not produce required risk assessment documentation, could not produce evidence of having developed a measurement procedures manual, and did not have a flow chart of the system to be measured; all steps identified in the federal standards to help ensure data reliability. Likewise, the military Services indicated that they had not designed some important internal controls for distribution performance measurement, such as the recurring use of edit checks. In short, the survey indicated that many of DoD's internal controls at various levels may not be adequate to ensure high quality data. These indications are consistent with an initial Data Accuracy LOE finding of questionable data quality.

¹ U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government* (the "Green Book"), GAO-14-704G, September 2014, sets the standards for an effective internal control system for all federal Agencies and provides the overall framework for designing, implementing, and operating an effective internal control system.

² GAO, "Improvements Needed to Accurately Assess the Performance of DOD's Material Distribution Pipeline," GAO-15-226, February 2015. Data-reliability questionnaires were sent to each of the military Services (except the U.S. Marine Corps) and USTRANSCOM for this GAO report. Responses were compared to the *Standards for Internal Control in the Federal Government* requirements.

³ GAO, *Standards for Internal Control in the Federal Government*. External nonfinancial reporting objectives for internal controls are related to the release of nonfinancial information in accordance with appropriate standards, applicable laws and regulations, as well as expectations of stakeholders.

Data quality begins with the specific data elements that must be collected in various systems, at multiple locations, in order to populate the metrics in the suite. To support the responsiveness metrics (TDD and CWT_{OM}), nine time stamp data elements must be collected:

- *Document Date*: date the tactical customer placed the order
- *Establish Date*: date the requisition was received at DLA Transaction Services (DLA TS)
- *Material Release Order Date*: date the Material Release Order was transmitted through DLA TS to allow the order to be filled by the supply location; when the National Supply Management System or item manager directs the release of materiel from stock on hand to a customer or supply activity
- *Warehouse Ship Date*: date the requisition physically departs the warehouse or storage location
- *Consolidation and Containerization Point (CCP) Ship Date*: date the requisition physically departs from the CCP location (for military air line of communications (MILALOC) shipments)
- *Carrier Pick-up Date*: date the shipment was picked-up by the carrier from the shipper/government representative at the supplier location (for total delivery services program (TDS), CAT-A, and ocean shipments)
- *Port of Debarkation (POD) Ship Date*: date that control over the requisition's movement shifts to theater personnel or assets (for MILALOC shipments)
- *Carrier Drop-off Date*: date the shipment was successfully delivered to the government customer/representative at the theater location (for TDS, CAT-A, and ocean shipments)
- *Customer Receipt Date*: date the customer posts a receipt in consignee stock records and/or transmits a receipt transaction back to DLA TS.

To populate the suite's reliability metric, WPOF(-), three data elements must be collected:

- *Delivered in Full (Quantity)*: validates that the amount shipped matches the amount requested by the customer, signifying a completely filled order
- *Perfect Condition (Quality)*: identifies any *customer* complaints regarding product quality, signifying that an order is free of defects or damages
- *Documentation Accuracy (Documentation)*: identifies any customer complaints regarding shipping documentation received with the product.

Each of these data elements should be traced through the distribution chain from supplier sources, through transporter modes, and to final customers/locations in order to properly adhere to data quality standards.

In conducting more detailed evaluations of many of these data elements, the Data Quality LOE uncovered three principal data quality issues consistent with internal controls shortcomings:

- *Data completeness*—several systems contained blank data entries for required fields.⁴
- *Data element definition consistency and data comparability*—several systems had inconsistent entries for the same data element, either internal to a given system or across similar/related systems, rendering comparisons of apparently identical data elements problematic.⁵ This results from inconsistent definition of data elements for a particular process and/or inaccurate mapping of them in relation to one another.
- *Compounding of data error at successively higher levels*—several systems worked well, with acceptable data error rates, at lower Service/Agency levels, giving the impression there is no need for system improvement; but when their data are aggregated for use at higher levels, errors compound and data quality issues become evident.

Since data elements are collected and reside in myriad systems at various levels across DoD—many governed by different, local data collection processes and procedures—the complexity of trying to synchronize and harmonize data, especially when aggregating it at higher levels for performance measurement, only exacerbates these types of issues. DoD internal control policies should address these issues to improve data quality and performance measurement.

DIMENSIONS OF DATA QUALITY

Agencies subject to the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) are directed to develop procedures for reviewing and substantiating the quality of information before it is disseminated.⁶ The Government Performance and Results Act of 1993

⁴ For example, a review of Materiel Release Order Date entries found seven percent of shipments missing a date, despite being received by the customer. The Materiel Release Order Date signifies when the National Supply Management System or item manager directs the release of materiel from stock on hand to a customer or supply activity.

⁵ For example, when Materiel Release Order Dates were compared between the EBS and LMARS systems, entries differed for 17 percent of shipments during the review period. Of those differences, 92 percent showed EBS to be 1 day shorter than LMARS.

⁶ 44 U.S. Code, Chapter 35, Subchapter I, § 3506—Federal Agency Responsibilities.

(GPRA) also calls for Agencies subject to the Act to develop data quality plans describing procedures used to verify and validate measured values of actual performance.⁷

While legislation and federal requirements often refer to quality, the first step in actually assessing data quality is defining it concisely. Various approaches (both governmental and academic) to define data quality have yielded nine dimensions of quality. While these dimensions are generally consistent across the literature, the relative importance of each may vary depending upon the information being evaluated. These nine dimensions have been refined down to four measureable areas deemed critical to DoD: Relevance, Accuracy, Comparability and Interpretability.⁸

1. *Relevance*—data are relevant if they meet the needs of the user community. This starts with a clear, operationally focused definition for the data element. This definition must be consistently applied across the enterprise, and data must be collected or measured at a point in the process that is germane to users.

For example, the *CCP Ship Date* data element lacks specificity and therefore relevance. Definitions range from when the item is released to a carrier for movement, to when the item is physically shipped out of the CCP. These disparities can result in differences in CCP ship dates of several days, rendering the data much less relevant when viewed as a whole. Resolving such ambiguities across processes and systems is critical to improving relevance.

2. *Accuracy*—data are accurate if they describe phenomena they were designed to measure while correctly capturing the process event from the perspective of the data user. Stated another way, the content of the data field should reflect the event with the precision required by the user.
3. *Comparability*—data are comparable if they are similar enough (as defined by the data users) that a statistically and logically valid comparison of data collected across time, geography, or operational entities is possible. The comparability of different data sets determines whether and how they can be used collectively to support decision-making. Unless data represent the same process, collection point during that process, and similar operational environment, one should not expect the data to be directly comparable.

For example, *Warehouse Ship Date* is materially different depending upon sourcing from a DLA warehouse or a vendor's facility. DLA considers the Pick and Pack activity to be complete, and an item shipped, when it departs the warehouse. However, vendor definitions are much more flexible and include offer to the transporter, departure from the facility, and even when the item is billed to the government. Although it is labeled the same, this date field may not mean the

⁷ Government Performance and Results Act of 1993, Section 4. Verification means the checking or testing of performance data to reduce the risk of using data that contain significant errors. Validation means the testing of data to ensure that no error creates significant bias.

⁸ See Appendix E for a more detailed discussion of each data quality dimension.

same thing, depending on the source. Thus, it is difficult to use this date to compare activity durations, such as how long it took to complete Pick and Pack.

4. *Interpretability*—data can be properly interpreted if the user community has access to information about what the data represent and any limitations that might impact using the data in an analysis. Such information may reside in supplements such as system documentation, data dictionaries, or metadata. Interpretability information may cover data collection and processing methodologies and may overtly note accuracy limitations. By ensuring interpretability, users of the data can draw more accurate assumptions and conclusions.

For example, documentation on many Direct Vendor Delivery (DVD) shipments does not specify a timeliness standard to determine whether a shipment is on time or late. However it is operationally important to know that shipments meet DVD contractual standards, or established TDD standards if DVD contract standards are not specified. The lack of such documentation about established contractual standards means that a data user has no basis for interpreting DVD shipment performance.

Clear and concise definitions for data quality, based on these four dimensions, will form the foundation for

- establishing standards that define what “high quality” actually means,
- developing consistent data quality measurement processes,
- determining compliance with existing governing DoD data quality policy, and
- monitoring data quality improvements over time.

ACTIONS FOR DATA QUALITY SUCCESS

The remainder of this chapter discusses six actions that must occur to fully develop, adopt, and realize the benefit of an improved and compliant internal data quality control infrastructure—one that will ensure high levels of quality for the data elements used to populate metrics in the suite.

Action B-1: Evaluate Policies for DoD Internal Controls to Identify Gaps Relative to Legislative/Federal Guidance

Responses to the GAO questionnaire completed under GAO-15-226 suggest there may be gaps in DoD's current data quality policies and indicate a need to review their adequacy and independently confirm policy compliance.⁹ Comparing existing DoD-level policy to federal requirements would allow gaps to be identified and rectified.¹⁰ Repeating this process at the Agency and Service levels will ensure that their policies and procedures align with appropriate DoD-level policies. A robust data quality policy will ensure that the current level of complexity in materiel distribution data—driven in part by the sheer number of DoD data collection and reporting systems and processes—does not lead to reliability issues.¹¹

This action seeks to validate DoD data quality policies at all levels, aligning Department-wide policy with federal requirements, and subordinate activity policies with those at the DoD level. This effort focuses on ensuring high-quality data for the data elements that populate the metrics in the suite.

Step 1 of this action is to identify gaps between DoD-level data quality and internal control policies and those established at the federal government level.¹²

Step 2 is to update existing DoD data quality policies to close these gaps and ensure compliance with federal standards and guidelines. Specific actions depend on the step one gap analysis, and solutions may range from amending existing policies to writing new, comprehensive DoD data quality policy.

Step 3 calls for military Services and DoD Agencies to analyze gaps between their policies and guidance and DoD-level policies. The goal is to identify and correct gaps to ensure alignment across the distribution enterprise and compliance with federal policies at all DoD levels.

⁹ GAO, "Improvements Needed to Accurately Assess the Performance of DOD's Material Distribution Pipeline," GAO-15-226, February 2015.

¹⁰ Office of Management and Budget (OMB) Circular A-123, "Management Accountability and Control," revised June 21, 1995 provides the specific requirements for assessing and reporting on controls.

¹¹ At the April 13, 2016, Distribution Working Group meeting, USTRANSCOM indicated that 80 or more systems currently capture or transmit the distribution data it uses.

¹² A formal review of existing DoD policy and guidance related to supply chain management and materiel distribution was not undertaken as part of this LOE. Chapter 4, *Policy and Governance*, contains recommendations for improving existing DoD policy and guidance to close identified gaps. In reviewing data quality issues from a macro and micro perspective under this LOE, it became clear that DoD policy gaps undoubtedly exist and should be identified and corrected.

Goal	Recommended action to meet the goal	Target date
Improved DoD data quality policies and internal controls that are compliant with federal and legislative guidance	Step 1. Investigate existing Department-level data quality and internal control policies and direction for compliance with applicable federal and legislative guidance.	6 months from MDIP approval
	Step 2. If gaps are identified in Step 1, recommend new DoD policies, or amendments to existing policies, to create compliant infrastructure, standards, and monitoring/assessment processes that bring DoD into compliance with federal data quality requirements.	18 months after completion of Step 1
	Step 3. Require DoD Agencies investigate their local-level data quality and internal controls policies and direction for compliance with Department-level guidance. If gaps are identified, have Agencies address those gaps.	12 months after completion of Step 2

Action B-2: Develop Standards for Assessing the Quality of Data Elements Used to Populate Metrics in the Suite

Ensuring the quality of materiel distribution enterprise data is critical to the credibility and efficacy of the metrics in the suite. The actionable information provided in those metrics is constrained by the quality of the data behind them.¹³

As previously discussed, data quality can be defined across multiple dimensions, with the most critical for DoD being Relevance, Accuracy, Comparability and Interpretability. These dimensions can and should be translated into measurable standards that are clearly defined, well documented, capable of consistent application, and measurable.¹⁴ Each data element supporting metrics in the suite should be assessed on each of the four data quality dimensions by scoring various attributes associated with that dimension.

The first step in measuring data quality is to review each data element to determine which operational locations and systems will require a unique assessment for that element. For example, the way *Warehouse Ship Date* is collected and recorded at DLA, Service, and individual vendor warehouses must be reviewed to determine consistency with the data element definition. If all vendor contracts specify a warehouse ship date consistent with the definition, then individual vendors can be grouped together in an assessment. If vendors have differing definitions, then separate assessments will be needed based on data collection characteristics.

Once the assessment groupings have been determined, each data element will be rated on each data quality dimension by scoring the attributes associated with it. Continuing with

¹³ GAO-15-290, "High Risk Series: An Update," February 2015, page 189 noted "DoD has not assessed the reliability of the data included in its performance metrics (limiting) their usefulness for monitoring performance and demonstrating progress."

¹⁴ The standards should also provide information from data providers about known data quality shortcomings so data users can understand any limitations on the use of that data.

the example of *Warehouse Ship Date*, the dimension of Accuracy would be rated by assessing each warehouse's procedures for recording that data element in its automated systems. If processes for data recording differ by mode of transportation, then each location-mode combination must be evaluated. The following Accuracy attributes would be used:

1. *Correctness*—whether the date stamp collected is consistent with the DoD definition for Warehouse Ship Date (i.e., physical departure from the warehouse). If yes for each mode, it is assigned a “Go” rating.
2. *Precision*—whether the date stamp is accurate to the day (in this case) the activity was actually performed. If yes, it is assigned a “Go” rating.
3. *Completeness*—the percentage of shipments that actually have a date stamp entry (are not blank), compared to an established performance goal—for example, 95 percent. If the performance goal is met, it is assigned a “Go” rating.

Each attribute would be assigned a compliant (“Go”) or non-compliant (“No Go”) score for each location-mode combination, as illustrated in Table 3-1. These ratings could be based on the data being physically present or absent (pass/fail) or on the data being present at some level of compliance per defined standards (conditional pass if the data are present and compliant in a certain percent of records or more, but fail below that level).

In Table 3-1 the first distribution stream, DDSP-TDS-GY, is compliant for each Accuracy attribute and would earn an overall “Go” rating (G). Each shipment via this stream is compliant with the data quality standards for Accuracy. For the other two streams (DDJC-TDS-GY and DLA Depot-Ocean-GY), the Precision attribute is scored non-compliant, so a “No Go” rating (NG) is assigned. Each shipment via these streams is not compliant with data quality standards established for the Accuracy dimension.

Table 3-1 shows that DDSP-TDS-GY is also compliant on each of the other attributes and quality dimensions, so this entire stream is rated Go for overall data quality. Stream DDJC-TDS-GY has compliance issues in both the Relevance and Comparability dimensions. This stream is “No Go” overall. DLA Depot-Ocean-GY has a problem only with the Precision attribute. Correcting that one issue would render the data stream compliant with the Accuracy dimension and therefore compliant overall.

Using this type of attribute validation checklist allows for the rapid identification of data quality problems. Resources can then be assigned to resolve the problems offering the best opportunity to bring a stream up to data quality standards on all dimensions.

Table 3-1. Data Quality Attribute Validation Checklist and Scoring

Criteria	DDSP-TDS-GY	DDJC-TDS-GY	DLA Depot-Ocean-GY
Relevance			
Timeliness	G	G	G
Accessibility	G	NG	G
Format	G	NG	G
Data Content	G	G	G
Accuracy			
Correct	G	G	G
Precise	G	NG	NG
Filled	G	G	G
Comparability			
Coherence	G	NG	G
Incompatible Method	G	NG	G
Metadata	G	G	G
Internal Controls	G	G	G
Interpretability	G	G	G
Stream Rating	G	NG	NG

Note: G=Go; NG = No Go.

This action seeks to establish data quality definitions, standards, and validation procedures that will ensure the quality of distribution performance data used to populate the metrics in the suite.

Goal	Recommended action to meet the goal	Target date
DoD data quality standards that ensure the availability of high quality data to support metrics in the suite	Step 1. Develop definitions and establish standards for data quality using the four dimensions of Relevance, Accuracy, Comparability, and Interpretability. These definitions and standards should focus on the data elements that populate metrics in the suite.	8 months from MDIP approval
	Step 2. Based on the standards developed in step 1, develop validation checklists to assess the attributes associated with each data quality dimension for each of the individual data elements used to populate the metrics in the suite.	2 months after completion of Step 1

Action B-3: Adopt the Data Quality Compliance Metric to Monitor Data Quality Improvements

The Data Quality Compliance (DQC) metric should provide the JDDE COI with a clear picture of how well the data elements supporting the metrics in the suite are complying with the data quality standards developed in Action B-2. The metric should also allow the JDDE governance structure to monitor enterprise-level compliance trends. Regular monitoring will support decision-making and help identify areas of opportunity and risk.

This metric essentially summarizes results from the individual data element assessments described in Action B-2. During the assessment, the basic unit being measured is the shipment record: Does the record contain data elements that are compliant with data quality standards from start (at the warehouse) to finish (receipt by the customer)? If all data elements for a shipment are compliant, it would be scored a “Go.” If one or more data elements have non-compliant attributes—for example, a shipment transiting the DDJC-TDS-GY stream has a *Warehouse Ship Date* that failed the Precision assessment—the shipment is assigned a “No Go” score.

For a given period (for example, 1 month), total compliant shipments (all Go) would be divided by total shipments for a given month, yielding a percentage of compliance. To illustrate, if 1 million orders were shipped over the course of a month and 400,000 orders were rated compliant—that is, they had zero “No Go” attribute scores—then data quality would be scored as 40 percent, meaning that 40 percent of shipments were fully compliant with all data quality standards.

While this represents the summary metric for management review, a variety of secondary metrics could be explored, such as the following:

- *Attribute performance*—compliance by attribute could be tracked over time to identify attributes that are not improving. Pareto analysis could reveal which attributes are most responsible for compliance issues and creating systemic problems, allowing management to focus improvement efforts on the root causes of problems.
- *Stream performance*—individual streams could be examined to determine which are impacting compliance the most. For example, a stream like Army Warehouses–Military Air–Afghanistan is more likely to impact DoD compliance than USMC Warehouses–Ocean–Guam. When combined with a review of the attributes, improvement efforts could be focused quickly on the areas with the highest levels of non-compliance and their causes.

This action seeks to establish a management-oriented, DQC metric for assessing distribution performance data against established quality definitions and standards. The final metric should provide the JDDE governance structure actionable information about enterprise data quality to ensure that metrics in the suite accurately reflect actual distribution performance.

Goal	Recommended action to meet the goal	Target date
Ability to assess, at an enterprise level, the quality of distribution data against established DoD standards	Adopt the Data Quality Compliance (DQC) Metric as the materiel distribution enterprise data quality metric. Create and manage a DQC metric development plan that would identify required data, the responsibilities for sourcing that data, and the linkages needed acquire the data in order to create the metric.	18 months after MDIP approval

Action B-4: Assign Responsibility to Oversee Enterprise Materiel Distribution Performance Data Quality

DoDI 5158.06 appears to give USTRANSCOM, as the DPO, the overarching responsibility and authority necessary to implement enterprise data quality improvement efforts.¹⁵ USTRANSCOM's Data Quality Working Group, consisting of internal J3, J34, and J6 representatives, has already assumed a degree of responsibility for improving the quality of materiel distribution data across the enterprise. This group is the logical core around which to build a DPO-driven, enterprise approach to managing all DoD distribution data quality.

Under DoDI 5158.06 authority, the DPO should be responsible for ensuring that internal controls and quality policies are compliant (per Action B-1) and that established standards and processes for assessing data quality are being adhered to (per Actions B-2 and B-3). By using the USTRANSCOM's Data Quality Working Group, the DPO could take responsibility for coordinating and synchronizing the efforts of data quality working groups and authorities at the Agency and Service levels, to establish internal controls and improve data quality in support of enterprise (not just local) goals.

To accomplish this type of enterprise-wide data quality management role, the Working Group must be made more robust, with expanded membership that includes representatives from all DoD Services and Agencies. Any charter the Working Group is currently operating under would likely require revision to include responsibility for data quality metrics production and oversight across the Department. Resources should be assigned commensurate with those responsibilities.

Like the metrics in the suite, the overarching quality of data underpinning those metrics should be subject to regular review by the JDDE governance structure. There is little evidence that any of the JDDE governance bodies are regularly monitoring data quality as part of their distribution oversight and process improvement responsibilities. Regular oversight of data quality at this level, similar to that described under Action A-7, will ensure continued progress in this area.

Additionally, an information repository should be established that supports the Interpretability dimension of data quality for benefit of the entire JDDE COI. This repository

¹⁵ Section 5.4.7.8, Department of Defense Instruction Number 5158.06, *Distribution Process Owner (DPO)*, September 11, 2007.

would hold documentation concerning known limitations of all data elements, including complete limitation descriptions, their significance and impact on meeting established standards, and any steps taken or proposed to address them. The repository should be universally accessible to all JDDE stakeholders to enable a more complete understanding of data quality issues surrounding a particular data element prior to its use.¹⁶

This action seeks to establish a body responsible for coordinating data quality policy and internal controls at all levels within DoD in support of enterprise goals. This body would be tasked with monitoring data quality through calculation and review of the enterprise Data Quality Compliance metric and any supporting analysis as described in Action B-3, as well as coordinating all efforts to correct and improve data quality issues revealed by that metric. The action also would establish a data information repository to assist with interpretability of data at all levels, as well as ensure that the JDDE governance structure is regularly reviewing data quality as part of its distribution process oversight and improvement role.

Goal	Recommended action to meet the goal	Target date
Enterprise oversight and management for data quality, including a programmatic approach for coordinating and synchronizing internal controls, procedures, measurement processes, monitoring efforts, and improvement initiatives for data quality at all DoD Agency and Service levels	Step 1. Assign responsibility and resources to a materiel distribution data quality management and oversight body.	3 months after MDIP approval
	Step 2. Identify and implement a central repository for data quality documentation.	3 months after MDIP approval
	Step 3. Adjust the JDDE governance structure charter and operating procedures to require regular reviews of distribution data quality (using the DQC metric and associated lower-level analysis) by all bodies during their normal, periodic meetings.	6–12 months after MDIP approval

¹⁶ An option for the document repository could be DLA Joint Lessons Learned Info System (JLLIS) as described at: <https://www.jllis.mil/apps/>. This and other options should be evaluated to determine what best meets DoD’s needs.

Action B-5: Identify the Data Elements Necessary to Populate the Finished Product Logistics Cost (FPLC) Metric and Develop Quality Standards and Validation Procedures to Assess Their Data Quality

Action A-6 recommends the adoption of FPLC as a new distribution cost-efficiency metric. Significant research and development remain to be done before this metric is established. Data supporting this metric likely resides in multiple systems with several stakeholders, DLA, and USTRANSCOM being the principal ones.

Once FPLC is established, the data elements required to populate it must be identified and formally defined, similar to the effort already accomplished for the Responsiveness (TDD, CWT_{OM}) and Reliability (WPOF(-)) metrics. When the data elements are known, procedures must be developed to validate their quality using definitions and standards described in Action B-2.

This action seeks to establish the data elements needed to populate the new FPLC cost-efficiency metric and develop standards and validation procedures for determining their quality consistent with actions recommended in Action B-2.

Goal	Recommended action to meet the goal	Target date
Confidence in the quality of data underpinning the new FPLC distribution cost-efficiency metric	Based on the definition of FPLC created in Action A-6, develop the infrastructure (definitions, standards, validation procedures) required to evaluate the quality of data associated with the metric.	6 months after the FPLC is defined and established as part of the suite

Action B-6: Develop a DoD Compliant Sustainment Distribution Data Solution that Consolidates Existing Systems into a Single Source

The DPO requires a formal data solution that facilitates its present and future analytic needs. The DPO's current ability to confidently utilize and maintain sustainment distribution data is impaired by two major issues: lack of confidence in the data and insufficient stability of the data structure.

DATA CONFIDENCE

The issue of data confidence arises from the need to consolidate distribution data across many systems into a single data structure, resulting in a common outcome. Although existing logistics data systems usually support local requirements at adequate levels, DoD's total supply chain includes many stakeholders using independently developed systems with varying data formats, definitions and collection procedures. Consolidating data from these independent systems can result in higher data error rates. The following are some examples:

- Mismatches in key tracking fields between commercial and DoD systems. For example, Transportation Control Numbers (TCNs) used by DoD to track movement throughout the supply chain are not supported by commercial systems. These systems were not designed to collect or enforce DoD quality requirements, and this can result in information gaps.
- Lack of common location data references across systems. Examples include differing location codes, ad hoc use of free text location data, using a base or installation name versus the city name, use of commercial reporting locations, and designation of location based on physical movements versus electronic movements.
- Events not clearly mapped to supply chain processes or defined differently across the supply chain. Examples include a Ship/Depart event that may have multiple meanings, such as "notified carrier for movement," "available for pickup," "box placed in a bay for transporter," "carrier signed document for pickup," "truck departed," or "truck arrived at the distribution center."
- Reuse of key tracking fields, which can create erroneous duplicate records in the same or across multiple systems. Examples include TCNs, Port Call File Numbers (PCFNs), Air Way Bills, Voyage Document Numbers, and Air Mission Identifiers, among others.
- Common terms that are not synonymous across different entities and are open to local interpretation.

Error rates within specific systems may be at acceptable levels for local users, but data confidence issues arise when the DPO combines data and outputs from these systems, in order to describe a more complex and holistic view of end-to-end materiel distribution.

The DPO inherits the source error rates and unintentionally compounds them when attempting to combine and align data from multiple systems. Current solutions involve developing and applying business rules that attempt to get to “ground truth” and maintain accuracy. However, such rules are often complex, known only to database developers at USTRANSCOM, and often do not completely resolve instances of missing or misaligned data.

DATA STABILITY

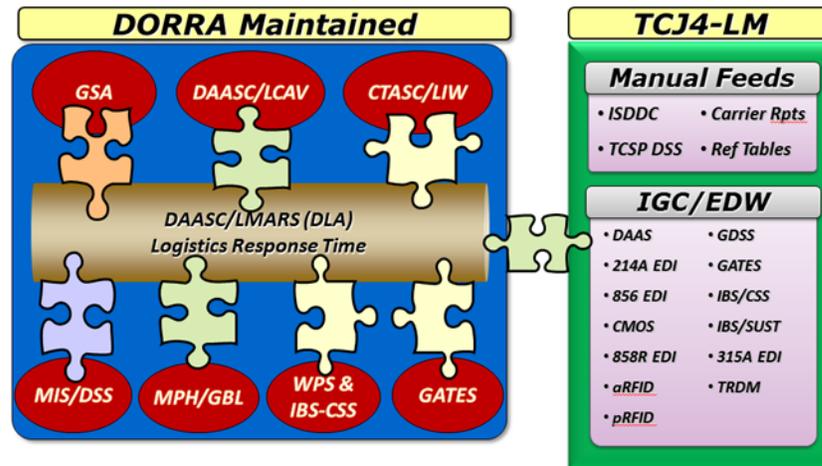
The more immediate data risk arises from the stability of the current solution. Stability is the ability of the process to be self-sustaining without the need for continual ad hoc actions or one-off workarounds. Stability is weakened by the concentration of system or process expertise in the hands of a select few.

To illustrate, the metric requiring the largest compilation of information from disparate systems is TDD. TDD’s requirement to “see” and provide process improvement to so many distribution pipeline events drove the RAND Corporation to develop the Strategic Distribution Database (SDDB) for DoD in 2001. SDDB is simply a collection of code that draws compiled information from other databases on a monthly basis for TDD calculation. Responsibility for this code eventually transferred from RAND to the DLA Office of Operations Research and Resource Analysis (DORRA).

Today, DORRA sends the SDDB to USTRANSCOM each month via a text file for the purpose of evaluating TDD. Over the years requests for additional analysis required USTRANSCOM to augment the SDDB with more data, sometimes from the same sources (such as GATES) that DORRA initially pulls from. Other times USTRANSCOM adds manual feeds, such as carrier reports, which may take the form of an Excel spreadsheet.

The result is a very ad hoc data structure that has been carefully nurtured for many years but perhaps only two people (one contractor and one government service employee) know intimately enough to properly maintain. Loss of the current contract or a career move by one or both of these in-the-know individuals would spell disaster for the DPO’s ability to manage TDD and sustainment distribution information in any competent manner. Figure 3-1 illustrates the complexity of the current SDDB. It shows the systems feeding data into SDDB, and indicates which data are maintained by DORRA and which are later added by USTRANSCOM’s J4 Metrics and Analysis Branch (TCJ4-LM).

Figure 3-1. SDDB's Complexity Yields System Stability Problems



In order to provide quality data that are not dependent on a small team of database developers, a DoD compliant solution for sustainment distribution data must be developed that consolidates existing systems into a single data source. The single source's business rules should be congruent with distribution data quality definitions, standards, processes, and procedures developed under Actions B-2 and B-3. The single data source should rely on fully automated processes to mitigate the risk inherent in the current SDDB system, of relying on a small team of data developers. The business rules should also include provisions for assessing data feeds from other systems to ensure data quality, and should contain a mechanism for providing feedback to those other systems when errors are found. The single data source should be responsive enough to accept changes without the need for workarounds. It should be useable, accessible, and responsive to personnel across DoD, from the data analysts at USTRANSCOM down to the warfighter.

By creating such a single data source, DoD would improve both data confidence and stability, while reducing the risk of losing data processing capability and making distribution decisions based on incorrect data. A single data source would also save money by eliminating labor- and time-intensive manual data processing.

The first step in establishing a single data source is developing a business case analysis (BCA) per the Office of the Deputy Chief Management Officer (DCMO) Guidance for Review and Certification of Defense Business Systems V 3.4, February 2015. Once the BCA has been developed, an informed decision can be made to continue with the defense business system certification process to establish and fund a consolidated, automated, single data source system.

Goal	Recommended action to meet the goal	Target date
Develop a DoD compliant solution for sustainment distribution data that consolidates existing systems into a single data source with the commonality required to perform highly confident DPO analysis and other required global sustainment analysis	Step 1. Develop a BCA for the consolidated single data source system in compliance with DCMO Guidance for Review and Certification of Defense Business Systems V 3.4, dated February 2015.	10 months from MDIP approval
	Step 2. Obtain approval and develop the consolidated single data source for sustainment distribution data per the DCMO guidance.	3 years from MDIP approval

Chapter 4

Policy and Governance

Several DoD policies and guidance documents outline how the Department will execute, monitor, and assess materiel distribution, and define and describe the responsibilities of the JDDE governance bodies. Policies include DoD Instructions (DoDI), Directives (DoDD), Regulations (DoDR), and Manuals (DoDM). Guidance includes doctrine such as the Joint Publication (JP) series and operating charters such as that defining the roles and responsibilities of the JDDE governance structure.

The Policy and Governance LOE reviewed an extensive list of policy and guidance documents (see Appendix F). This review resulted in several recommended actions for strengthening existing policy and guidance and further enhancing the JDDE governance structure. These actions not only close specific performance gaps identified during the review but also codify new requirements associated with recommended actions found in Chapters 2 and 3. Clear and prescriptive policy enables each of the materiel distribution LOEs—improving the way we measure distribution performance, ensuring that quality data are available to underpin our distribution metrics and inform our decision making, and establishing the requirements and foundation for effective distribution governance structures.

POLICY AND GUIDANCE DOCUMENTS

During the distribution policy and guidance review, the 14 key documents listed below emerged as central to defining organizational roles and responsibilities for collecting distribution metrics, measuring distribution performance, and initiating and monitoring functional distribution improvements.

DoD Directive 5134.12, Assistant Secretary of Defense for Logistics and Materiel Readiness—ASD (L&MR)

DoDD 5134.12 assigns ASD (L&MR) as the principal advisor to the Under Secretary of Defense for Acquisition, Technology and Logistics—USD (AT&L) and the Secretary and Deputy Secretary of Defense for logistics and materiel readiness issues within DoD. Also assigns ASD (L&MR) as the principal logistics official in Office of the Secretary of Defense (OSD) senior management, with authority, direction, and control over the Director, Defense Logistics Agency (DLA).

DoD Directive 5105.22, Defense Logistics Agency (DLA)

DoDD 5105.22 assigns DLA to provide effective and efficient worldwide logistics support to the military Departments and CCDRs under conditions of peace and war, other DoD components and federal agencies, and, when authorized by law, state and local government organizations, foreign governments, and international organizations.

DoD Directive 5158.04, United States Transportation Command (USTRANSCOM)

DoDD 5158.04 establishes USTRANSCOM as the single DoD manager for transportation other than Service-unique or theater-assigned assets. Designates CDRUSTRANSCOM as the DoD Distribution Process Owner. Assigns USTRANSCOM responsibility for providing common-user and commercial air, land, and sea transportation metrics to the DoD components and combatant commanders.

DoD Directive 4500.9E, Transportation and Traffic Management

DoDD 4500.9E establishes procedures for the transportation and distribution of DoD passengers, cargo, and household goods.

DoD Instruction 5158.06, Distribution Process Owner (DPO)

DoDI 5158.06 implements policy for USTRANSCOM to serve as the DPO. It assigns responsibility to USTRANSCOM to establish and implement JDDE performance standards and metrics to monitor and improve the JDDE performance. This instruction establishes that USTRANSCOM, as the DPO, will coordinate and collaborate with the JDDE COI to establish a structure of governance bodies that meet regularly to develop, analyze, coordinate, and prioritize distribution-related and force projection, sustainment, and redeployment/retrograde operations improvement recommendations and business processes and rules for JDDE operations, including operational, institutional, and financial processes.

DoD Instruction 4500.57, Transportation and Traffic Management

DoDI 4500.57 establishes roles and responsibilities for DoD transportation and traffic management.

*DoD Instruction 4140.61, Customer Wait Time (CWT) and Time Definite Delivery (TDD)—**Pending Cancellation***

DoDI 4140.61 implements policy, assigns responsibilities, and prescribes procedures to establish a means of measuring and improving the customer responsiveness of the DoD logistics system. It defines CWT and TDD and assigns ASD (L&MR) responsibility for establishing a DoD CWT Committee to provide oversight on the use of CWT. This instruction assigns DoD components (including DLA and USTRANSCOM) responsibility for using CWT measurement and TDD standards to assess DoD supply chain performance as a basis for process improvements. The Department intends to cancel this issuance and is incorporating its content regarding roles and responsibilities for CWT and TDD within DoDM 4140.01 Volume 10.

DoD Instruction 4515.13, Air Transportation Eligibility

DoDI 4515.13 prescribes policies and assigns responsibilities for the transportation of DoD-sponsored passengers, cargo, and human remains in accordance with DoDD 4500.9E.

DoD Regulation 4500.9, Defense Transportation Regulation

DoDR 4500.9 establishes amplifying policy and provides procedural guidance for implementing the DoD transportation and traffic management policies of DoDD 4500.9E.

DoD Manual 4140.01 Volume 1, DoD Supply Chain Materiel Management Procedures: Operational Requirements

DoDM 4140.01 Volume 1 assigns DoD components with responsibility to evaluate and report on the performance and cost of DoD supply chain operations and inventory.

DoD Manual 4140.01 Volume 10, DoD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Measures

DoDM 4140.01 Volume 10 assigns ASD (L&MR) responsibility for monitoring and reviewing materiel readiness and sustainment support programs. It assigns DoD materiel managers to evaluate and report the performance and cost of their supply chain operations and inventory, including the overall effectiveness, efficiency, and reliability of the support provided to the warfighter, using such metrics as not mission capable supply (NMCS) backorders, CWT during specific segments of the supply chain, CWT for organizational maintenance, CWT for performance budget reporting, CWT for depot maintenance, and logistics response time (LRT). The manual assigns responsibility to DLA and the military Services to

- support supply chain performance agreements,
- monitor the efficient use of DoD resources,
- assess costs versus benefits of supply chain operations, and
- establish comparison benchmarks.

The manual assigns responsibility to DLA and the military Services to measure CWT, LRT, order response time (ORT), and the performance of their logistics processes against existing TDD standards.

Joint Publication 4-0, Joint Logistics

JP 4-0 describes the importance of reliability, dependability, and consistency in delivery of requested logistics support at a time and destination specified by the requiring activity.

Joint Publication 4-09, Distribution Operations

JP 4-09 describes the importance of distribution metrics and the need to develop metrics that assess the performance of the overall joint distribution pipeline and target areas for improvement.

Joint Deployment and Distribution Enterprise (JDDE) Governance Charter

The JDDE Governance Charter outlines the purpose, roles, and responsibilities of the JDDE governance structure, which consists of three general/flag officer review forums: the DPO Executive Board (DEB), the Distribution Oversight Council (DOC), and the Distribution Steering Group (DSG). These groups meet regularly to vet, analyze, develop, coordinate, decide, and prioritize recommendations for improving distribution operations, force projection, sustainment, and redeployment/retrograde operations, and business processes and rules for distribution operations.

POLICY AND GUIDANCE ISSUES AND ACTIONS

Four specific Policy and Guidance changes must occur to strengthen and align the Department's materiel distribution performance management and oversight posture, as well as accommodate (and make prescriptive) many of the recommended actions found in Chapters 2 and 3.

Action C-1: Adjust DoD Policy to Require USTRANSCOM to Routinely Share Performance Metrics, Including Cost Data, to JDDE Stakeholders

DoDI 5158.06 assigns USTRANSCOM responsibility for establishing and implementing performance standards and metrics to monitor and improve JDDE performance, but current DoD policy does not require USTRANSCOM to routinely share performance metrics, including cost data, to JDDE stakeholders. For example, USTRANSCOM is not required by existing policy to capture and provide TDD compliance reports to DoD components. This action codifies the requirement for USTRANSCOM to share metrics data with the JDDE COI.

Goal	Recommended action to meet the goal	Target date
Improved transparency of USTRANSCOM metrics for the JDDE COI	Step 1. Adjust DoD I 4500.57 and DoD Manual 4140.01, Volume 10, to require USTRANSCOM to collect and share internal performance metrics routinely with stakeholders. Metrics will focus on precision, reliability, efficiency, and information visibility.	6 months from MDIP approval
	Step 2. Due to the cancellation of DoDI 4140.61, update DoD Manual 4140.01 Volume 10 to include a TDD definition and the specified degree of probability (such as 85 percent or some other percentage as determined per Action A-5) with which the logistics system is capable of delivering required materiel to the customer within TDD standards. Include responsibility for USTRANSCOM to capture and routinely share TDD performance with the JDDE COI.	
	Step 3. Update DoDI 5158.06, requiring USTRANSCOM to establish and implement JDDE performance standards and metrics, including TDD standards down to the IDL level and eventually to the stream level per Action A-2, to monitor and improve JDDE performance. Long term, DoDI 5158.06 should reflect the separate stream TDD standards that will be developed for use by the distribution provider community based on capability, and those used by the customer community based on specific operational needs per Action A-4.	10 months from MDIP approval

Action C-2: Adjust DoD Policy to Require the JDDE Governance Structure to Conduct Routine, Metrics-Driven Program Reviews

Action A-6 recommends that the JDDE governance structure conduct program reviews of the metrics in the suite as part of its distribution performance oversight responsibilities. Likewise, Action B-3 recommends that the JDDE governance structure also regularly review the DQC metric to gain an enterprise assessment of the quality of data elements underpinning the suite’s metrics. This action codifies the requirement for the JDDE governance structure to conduct regular reviews of the metrics in the suite as well as the enterprise DQC metric as part of its distribution oversight and functional improvement responsibilities.

Goal	Recommended action to meet the goal	Target date
Regular programmatic reviews of enterprise distribution performance, cost and data quality by the JDDE governance structure	Update DoDI 5158.06, requiring synchronized, routine, metrics-based program reviews at each JDDE governance level, addressing distribution performance, cost, and data quality.	10 months after MDIP approval

Action C-3: Adjust DoD Policy to Require ASD (L&MR) to Capture and Share Distribution Performance Metrics

ASD (L&MR) is currently capturing distribution performance metrics in its Supply Chain and Transportation Dashboard Tool. However, there is currently no requirement for that office to share this information with the JDDE COI. This action codifies a requirement to make this valuable information available to the JDDE COI.

Goal	Recommended action to meet the goal	Target date
Greater transparency of ASD (L&MR) distribution performance data across the JDDE COI	Update DoDD 5134.12, assigning ASD (L&MR) responsibility to capture, analyze, and routinely share distribution performance metrics—for example, those derived from its Supply Chain and Transportation Dashboard Tool.	10 months after MDIP approval

Action C-4: Adjust DoD Policy to Require DoD Components, to Include CCDRs, to Capture, Analyze, and Share Specific Cost Data Across the Enterprise

As noted in Chapters 1, 2 and Appendix D, many valuable distribution performance metrics are captured by DoD Agencies and the Services at all levels. For example the *Supply Chain Metrics Guide* contains 23 Enterprise metrics and 11 Distribution Effectiveness metrics that the SCMWG regularly reviews and acts upon. The JDDE COI would benefit from greater transparency of these metrics. This action codifies a requirement to share metrics captured by DoD components, including the Services, other Agencies, and the CCDRs, across the JDDE COI.

Goal	Recommended action to meet the goal	Target date
Greater transparency of Service, Agency, and CCDR distribution performance data, including cost data	Update the DoD Manual 4140.01 Volume 10, requiring DoD components to capture and provide distribution data, including cost data, at an interval and in a format and forum as specified by ASD (L&MR).	10 months after MDIP approval

MATERIEL DISTRIBUTION GOVERNANCE

Chapter 1 briefly described the existing JDDE governance structure, consisting of the DEB, DOC, and DSG. DoDI 5158.06 required the DPO to establish this governance structure to oversee collaborative improvements in DoD distribution processes. Currently these bodies are considered to be staffed and resourced at appropriate levels to accomplish their collective mission of tracking distribution performance and implementing policy for overseeing, coordinating, and synchronizing the end-to-end distribution process improvements. Although interlinked and in regular communication with one another, each body has a specific membership and a set of distinct responsibilities as described in the JDDE Governance Charter (dated 29 January 2013) and summarized here.

Distribution Process Owner Executive Board (DEB)

The DEB is the most senior of the three bodies and is chaired by CDRUSTRANSCOM/DPO. DEB members are 3-Star or Senior Executive Service (SES) equivalent level. The DEB meets annually or as necessary. Its focus is strategic, and it is the influential forum for examining existing, emerging, and future distribution improvements across the range of military operations (such as combat, security operations, engagement, and relief and reconstruction). The DEB considers, approves, and guides JDDE strategies and initiatives and imparts strategic guidance to the JDDE.

Distribution Oversight Council (DOC)

The DOC is the next most senior of the three bodies and is chaired by the DepCDRUSTRANSCOM. DOC members are at the 1 and 2-Star or SES equivalent level. The DOC meets semiannually or as necessary. Its focus is on operational improvement of the JDDE, and it is the forum that deliberates on JDDE standards, processes, policies, business rules, improvement initiatives, and IT solutions as recommend by the DSG. The DOC is tasked with ensuring that the most relevant, highest priority distribution capability-based initiatives and enterprise improvements are pursued, commensurate with authorized resources.

Distribution Steering Group (DSG)

The DSG is the most junior level board and is co-chaired by USTRANSCOM J5/J4 and DLA-J3. Consisting of an O-6/GS-15 level equivalent membership, it meets quarterly or as necessary. The DSG's focus is at the action officer level, and it seeks out and evaluates JDDE improvements using enterprise performance measures that assess the overall effectiveness and efficiency of joint distribution-related activities. The DSG recommends appropriate joint distribution solutions to improve distribution processes and ensure the Defense Transportation System's readiness while incurring minimum total supply chain costs.

GOVERNANCE ISSUES AND ACTIONS

No recommendations for improving the JDDE governance structure have emerged other than the recommendation captured in Action C-2 to undertake regular programmatic reviews of both distribution performance metrics in the suite (Action A-6) and enterprise distribution data quality using the DQC metric (Action B-3), as part of its oversight and functional improvement responsibilities.

Appendix A

MDIP Sub-Working Group Membership

Each of the main chapters in the MDIP was developed by a sub-working group established by the Distribution Working Group (DSG) working under the direction of the Supply Chain Executive Steering Committee (SCESC). The SCESC also established the working groups responsible for developing the related *CIMIP* and *Strategy for Improving Asset Visibility* documents.

DISTRIBUTION WORKING GROUP

<i>Agency</i>	<i>Name</i>
OSD-SCI	Col Grant Izzi, Mr. Randy Kendrick
USTRANSCOM <i>Co-Lead Agencies</i>	Mr. Mike Hansen
OSD Transportation Policy	Mr. Ron Black
USTRANSCOM, J4-LM	LTC John Hiltz
USTRANSCOM, J4-LD	Dr. Mark Cyr
DLA J34	Ms. Joy Carter
Air Force	CMSgt Charles Nimmo
Army	Mr. Steve Lord
U.S. Marine Corps (USMC)	Mr. Lakye Franklin
Navy	Mr. Jeff Adcock
JS J4	Mr. Jim Higgins

METRICS AND PERFORMANCE SUB-WORKING GROUP

USTRANSCOM's Metrics and Analysis Branch of the J4's Logistics Divisions (TCJ4-LM) led the effort to develop the Metrics and Performance portion of the MDIP with assistance from the following organizations and individuals.

<i>Agency</i>	<i>Name</i>
USTRANSCOM (TCJ4-LM) <i>Lead Agency</i>	LTC John Hiltz
OSD-SCI	Mr. Paul Blackwell
OSD Transportation Policy	Mr. Ron Black
DLA J34 Metrics	Mr. Walter Miller
DLA J34 Transportation Policy	Mr. Scott Benson
DLA, DORRA	LCDR Lee Eubanks
Army, LOGSA	Mr. Michael Nickle
USMC, MARCORLOGCOM	Ms. Lori Godwin
Navy, NAVSUP WSS	Mr. Charles Frey
Air Force, 635 SCOW/LGT-ACA	Mr. Mark Didier

DATA ACCURACY SUB-WORKING GROUP

DLA's Office of Operations Research and Resource Analysis (DORRA) led the effort to develop the Data Accuracy portion of the MDIP with assistance from the following organizations and individuals.

<i>Agency</i>	<i>Name</i>
DLA (DORRA)	LCDR Lee Eubanks
<i>Lead Agency</i>	Mr. David Jones
USTRANSCOM	Mr. Nick Brant
OSD Transportation Policy	Mr. Ron Black
DLA J34 Metrics	Mr. James Morgan
Army, LOGSA	Mr. Michael Nickle
USMC, MARCORLOGCOM	Ms. Lori Godwin
Navy, NAVSUP WSS	Ms. Lynn Reed
Air Force, 635 SCOW/LGT-ACA	Mr. Mark Didier

POLICY AND GOVERNANCE SUB-WORKING GROUP

The OSD Office's for Transportation Policy and Supply Chain Integration co-lead the effort to develop the Policy and Governance portion of the MDIP with assistance from the following organizations and individuals

<i>Agency</i>	<i>Name</i>
OSD Transportation Policy/ OSD SCI <i>Co-Lead Agencies</i>	Mr. Ron Black, Mr. Jared Andrews Col Grant Izzi, Mr. Randy Kendrick
JS-J4	Mr. Jim Higgins
USTRANSCOM	Mr. Mike Hansen
DLA J34 Metrics	Ms. Joy Carter
Army, LOGSA	Mr. Michael Nickle
USMC, MARCORLOGCOM	Mr. Lakye Franklin
Navy, NAVSUP WSS	Ms. Josephine Policastro
Air Force	Mr. Jim Wakeley

Appendix B

USTRANSCOM and JDDE Establishment and Evolution

ORIGINS

Today's JDDE and its associated operational processes are the result of many actions, reviews, studies, lessons learned, and adaptations that have unfolded since the end of the Second World War. World War II, the Berlin blockade, the Korean War, and the war in Southeast Asia all demonstrated the need for the United States to maintain a capable and ready transportation/distribution system for national security. In 1978, DoD staged its first full-scale mobilization exercise since World War II. Exercise Nifty Nugget, which simulated wartime support of Western Europe, exposed serious problems in our ability to mobilize and deploy forces. The three deployment computer systems patched together to support the exercise quickly proved incompatible and inadequate, contributing to confusion, communications breakdown, and lack of coordination among the Services.

Two major recommendations came out of Exercise Nifty Nugget. First, the Transportation Operating Agencies (later called the Transportation Component Commands) should have a direct reporting chain to the Joint Chiefs of Staff (JCS). Second, the JCS should establish a single manager for deployment and execution. The JCS formed the Joint Deployment Agency (JDA) in 1979 as that single manager for deployment. JDA began developing the Joint Deployment System (JDS), a computer system to link peacetime and crisis planning and to provide the JCS with information on unit readiness, movement priorities, lift priorities, and status of equipment. Efforts to field JDS exposed JDA's fatal flaw—the new agency lacked authority commensurate with its responsibilities. While all the Services acknowledged the need for an improved system to manage deployment-essential information, not one was willing to abandon its own system or to share enough of its own data. In addition, the JDA did not have authority to direct the Transportation Operating Agencies or Unified and Specified Commanders to take corrective actions, keep data bases current, or adhere to improvement milestones. As a result, JDS never worked satisfactorily.

DRIVE TO JOINTNESS

In 1982, frustrated by numerous examples of Service parochialism such as those that led to the failure of the JDA and JDS, Congress began hearings on DoD reorganization. The hearings culminated in the Goldwater-Nichols Department of Defense Reorganization Act of 1986. The act amended Title 10, *United States Code* ("Armed Forces"), to eliminate obstacles that precluded integration of Service capabilities for effective joint warfighting, creating the modern concept of

jointness. The Goldwater-Nichols Act also took aim directly at the waste and duplication engendered in service parochialism by providing the Secretary of Defense with authority to take “appropriate action to provide more effective, efficient, and economical administration and operation, and to eliminate duplication, in the Department of Defense.”

USTRANSCOM ESTABLISHED

While the act brought greater jointness, unity of command, and effectiveness to the employment of forces, it did not immediately do the same for the deployment of forces. The joint deployment process was still disjointed and fragmented, with each Service maintaining operational control of, and setting priorities for, its own mobility assets. But in 1987, President Reagan ordered the Secretary of Defense to establish a unified transportation command (UTC), the U.S. Transportation Command (USTRANSCOM), to improve the effectiveness of defense transportation by integrating global air, land, and sea transportation; eliminating duplication; and streamlining procedures. USTRANSCOM also absorbed the JDA’s functions under its Directorate of Deployment.

USTRANSCOM initially had three transportation component commands to execute the Department’s strategic transportation function—the Air Force’s Military Airlift Command (redesignated Air Mobility Command in 1992), the Navy’s Military Sealift Command, and the Army’s Military Traffic Management Command, (renamed Military Surface Deployment and Distribution Command in 2004).

USTRANSCOM appeared to be the remedy for DoD’s fragmented and often criticized transportation system. Its establishment gave the United States, for the first time, a four-star, unified combatant commander to serve as single-point-of-contact for Defense Transportation System (DTS) customers and to act as advocate for the DTS in DoD and before Congress. But it soon became apparent that the UTC concept itself was incomplete in that the UTC implementation plan (IP) allowed the Services to retain their single-manager charters for their respective transportation modes and USTRANSCOM’s authorities were limited primarily to wartime. As a result, during peacetime, USTRANSCOM’s three component commands continued to operate day-to-day much as they did in the past, controlling their own industrial funds, maintaining responsibility for Service-unique missions, providing Service-oriented procurement and maintenance scheduling, and providing DoD charters during peacetime, single-manager, transportation operations. They also continued to have operational control of their own forces. It took a wartime test by fire, Desert Shield/Desert Storm, to bring to maturity a fully operational, peacetime and wartime, USTRANSCOM.

Foremost among the lessons learned in Desert Shield/Desert Storm was that USTRANSCOM and its component commands needed to operate in peacetime just as they would in wartime. Consequently, in early 1992, the Secretary of Defense gave USTRANSCOM a new charter stating the command’s mission to be

“to provide air, land, and sea transportation for the Department of Defense, both in time of peace and time of war.” The new charter greatly expanded the authorities of the USTRANSCOM commander. Under it, the Service Secretaries assigned the three components to the USTRANSCOM commander in peace and war. The military departments all assigned to USTRANCOM all transportation assets except those that were Service-unique or theater-assigned. The charter also made the USTRANSCOM commander DoD’s single manager for transportation, other than Service-unique and theater-assigned assets. Thus, the new charter made CINCUSTRANSCOM DoD’s single manager for Transportation, exercising combatant command authority (COCOM) over the three transportation component commands.

Although USTRANSCOM was now the single manager for transportation within the Department, it still did not control all of the functional elements necessary to achieve coordinated, synchronized deployment and distribution. This realization was made clear by the unprecedented operations tempo and deployment frequency experienced since the early 1980s, and the many studies that highlighted recurring deployment process problems, including

- inaccurate unit movement data;
- units unprepared for deployment on the planned schedule;
- mismatches between the CONUS, intertheater, and intratheater phases of the deployment; and
- the inability of the supported CCMD to monitor and control the deployment and distribution flow.

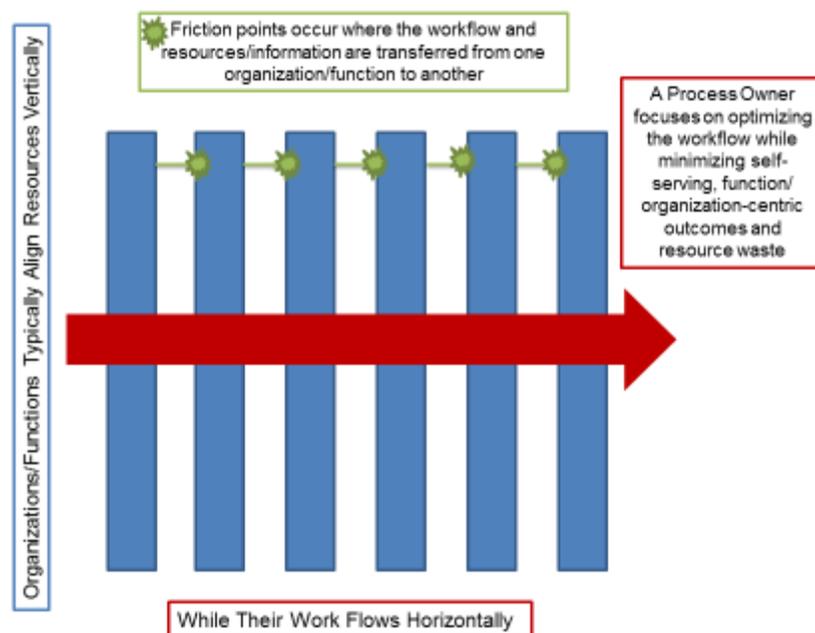
NEED FOR A DISTRIBUTION PROCESS OWNER

Problems in the deployment process were mainly occurring at the seams or connection points, where physical resources or information are transferred between different organizations or across different functions within an organization. For the deployment process, this occurs primarily at the ports of embarkation and debarkation (POEs and PODs respectively)—the two “anchor points” of a deployment movement. At the POE, a force provider or unit commander embarks elements under his or her operational control (OPCON) onto USTRANSCOM-controlled assets for strategic transport. At the POD, USTRANSCOM debarks those same elements to a CDR or joint force commander for further movement to the point of employment or point of need within the theater. Although OPCON of the embarked forces is never surrendered to USTRANSCOM, the physical transfer of personnel and equipment onto and off of transportation assets for the strategic transport leg of the deployment is endemic with connection-point friction.

Such seams are the predictable byproducts of most functionally aligned organizations. DoD is organized functionally (as are most commercial entities), with separate vertical “silos” for such functions as manpower and personnel; intelligence; operations; logistics; plans and policy; command, control, communications, and computer systems; operational plans; program analysis; financial management; public affairs; and others. On top of this, the Department has separate administrative and operational chains of command.

To overcome problems stemming from friction between vertical functions when processes crossed them, many commercial entities were turning to the concept of designating a “process manager” in addition to their functional managers. Such process owners would have responsibility and authority to manage a specific work flow or process that cut across the distinct vertical functions within an organization (and, in DoD’s case, separate lines-of-command as well) as shown in Figure B-1. The process owner’s role would be to create, refine, and manage an effective and efficient process while limiting function-centric activities and goals that are wasteful, redundant or inconsistent with overall process performance.

Figure B-1. The Case for Designating a Process Owner



Due to the long-standing deployment process problems and the apparent success the commercial world was having with process managers, the Department took a keen interest in designating a joint deployment process owner (JDPO) in 1999 and then a distribution process owner (DPO) in 2003. Ownership responsibility for the deployment process went initially to U.S. Atlantic Command (USACOM) and later to U.S. Joint Forces Command (USJFCOM), as a result of that organization’s existing responsibilities as joint force integrator, trainer, and provider of the majority of the Nation’s combat forces. Ownership of the distribution process officially went to USTRANSCOM. As the DPO, USTRANSCOM began to partner

with other combatant commands, Military Services, Defense Agencies, Office of the Secretary of Defense, the Joint Staff, and commercial industry to improve the JDDE.

In 2004, USTRANSCOM became the portfolio manager for DoD logistics information technology (IT) systems and began to research IT services necessary to improve and streamline the entire DoD supply chain, including the materiel distribution function. In 2006, USTRANSCOM was also designated the mobility joint force provider with authority to identify, recommend and supervise implementation of global transportation sourcing solutions. And in 2007, USTRANSCOM also became the Department's lead agent for automated identification technology. Collectively, these three designations served to further refine and strengthen the joint distribution process.

JOINT CAPABILITY PORTFOLIOS, JOINT CAPABILITY AREAS, AND THE BEGINNINGS OF THE JOINT ENTERPRISE CONCEPT

By 2007, the Department had begun to take a more holistic approach to managing and improving its supply chain and the entire logistics function. Jointness was by now highly entrenched in DoD's collective thinking and its approaches. DoD began to develop the concept of creating capability portfolios of related capabilities necessary for the joint force to operate in current and future joint operating environments, and assigning designated military and civilian co-leads to integrate, synchronize, and coordinate those capabilities. The goal was to manage portfolios on behalf of, and for the benefit of, the entire Department and to optimize limited defense resources.

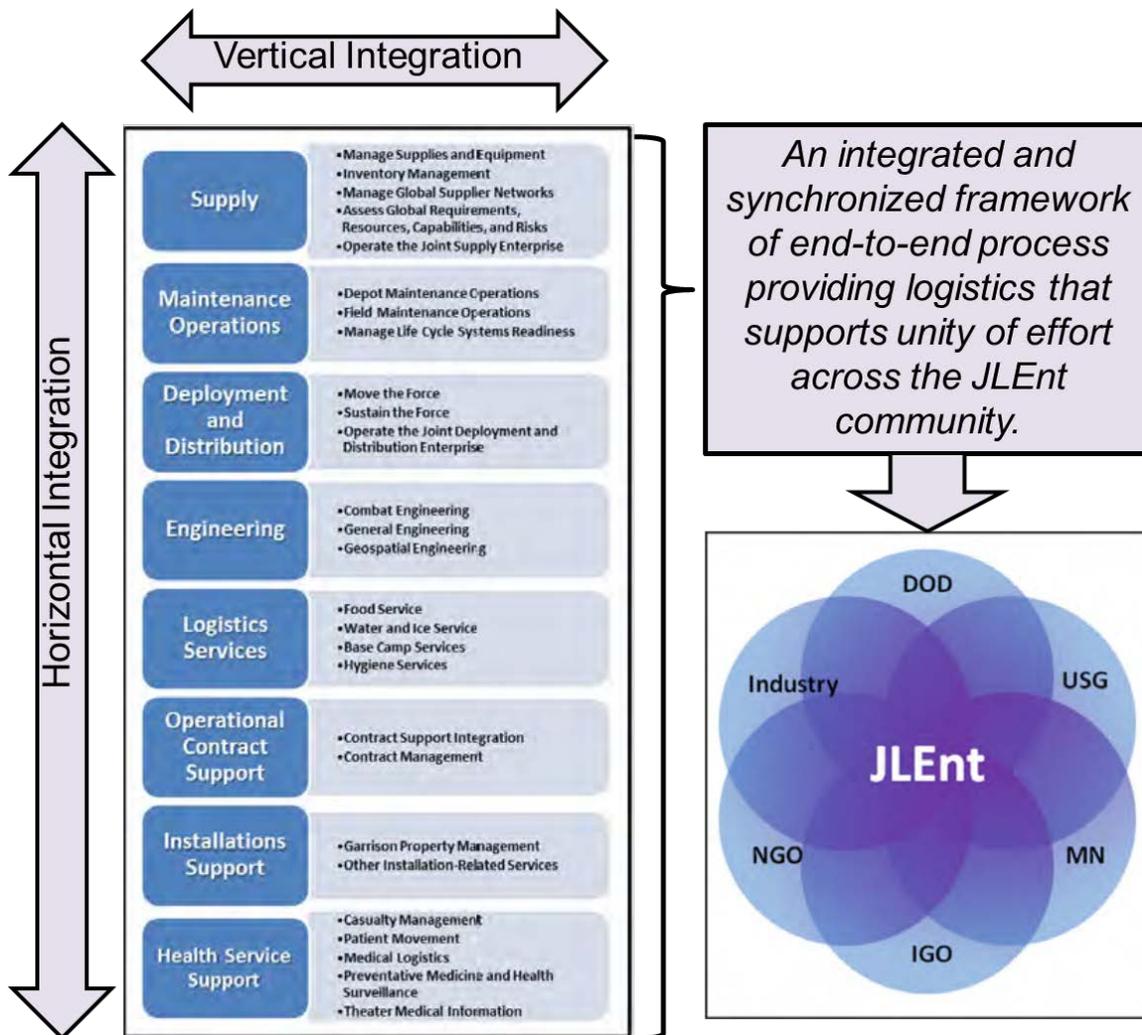
This capability portfolio management approach went hand-in-hand with the development and refinement of joint integrating concepts (JICs) and joint capability areas (JCAs). JICs were essentially common frameworks developed to provide for the integrated employment and support of joint forces conducting joint operations aligned with the Chairman's vision and the future joint operating environment. JCAs were collections of related DoD capabilities, functionally grouped to support not only better management and more optimal use of limited resources, but also analysis, strategy development, investment decision making, and capabilities-based force development and operational planning. Capability portfolios were aligned and managed around established JCAs. In 2008, OSD AT&L and USTRANSCOM were assigned as the civilian and military leads, respectively, for the Logistics Capability Portfolio (Logistics JCA), which included deployment and distribution.

JOINT LOGISTICS ENTERPRISE

By 2010, the Joint Staff J4 (JS J4) began developing the Joint Concept for Logistics to "present a common framework for providing logistics support to joint operations in the 2016–2028 timeframe and guide the development of future logistics capabilities." This concept included the idea of a joint logistics enterprise, or

JLEnt, process framework under which all the elements of the logistics JCA would be performed. Figure B-2 shows the logistics functions performed under the JLEnt process framework, including deployment and distribution.

Figure B-2. Logistics Functional Process Integration Supports the JLEnt

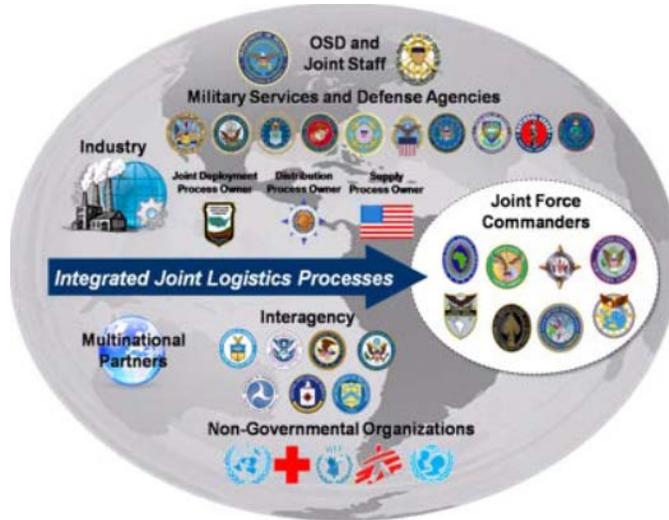


Note: IGO = Inter governmental organization; MN = Multinational; NGO =Non-governmental Organization; USG = U.S. government.

The JLEnt would create and manage integrated, synchronized end-to-end logistics processes, aligned both vertically and horizontally, and optimized to support the joint force commander. It would also promote logistics synchronization and unity of effort in a whole-of-government context, by encompassing other Federal Agencies, multi-national and non-governmental organizations (MNOs and NGOs), and commercial/industrial and academic partners, together with the Joint Staff, Military Services, other Defense Agencies, and CCMDs. Figure B-3 shows what the JLEnt looks like. A key objective of the JLEnt is to “deliver, position and sustain,

from any point-of-origin to any point-of-employment.” USTRANSCOM as the DPO is at the very center of this objective.

Figure B-3. Joint Logistics Enterprise (JLEnt)



JOINT DEPLOYMENT AND DISTRIBUTION ENTERPRISE

And so we arrive at today’s concept of the JDDE, integrated and synchronized by a DPO with coordinating authority for end-to-end distribution. JDDE works together with the other logistics functions and process owners under the framework of the JLEnt, providing end-to-end integrated distribution support to joint operations of any type, conducted anywhere. Thus, DoD materiel distribution has taken a transformative journey from Service-centric, highly fragmented, and uncoordinated to fully synchronized and operating under a well-defined, tightly coordinated, and comprehensive enterprise framework.

Appendix C

Service-Specific Materiel Distribution Accomplishments

The Services have developed, tested, and implemented several important materiel distribution initiatives. As members of the JDDE, the Services work in partnership with each other, DLA, and USTRANSCOM, as well as independently, to establish materiel distribution solutions having efficiency and effectiveness benefits at all levels.

NAVY

Modified Customer Wait Time (CWT) CPI

After preliminary work and a recommendation by the Supply Chain Executive Steering Committee (SCESC), the Navy Supply Systems Command (NAVSUP) undertook and completed a continuous process improvement (CPI) event with various Fleet stakeholders and DLA to investigate causes for excessive CWT. The event included the analysis of approximately 750,000 Navy requisitions within the DoD supply chain, leading to the identification of several process improvement areas. To validate the data analysis findings, site visits were conducted at strategic Fleet concentration areas within the Seventh and Fifth Fleet areas of responsibility. The NAVSUP Weapons System Support–Transportation and Distribution Team (WSS T&D) identified common causes for increased CWT, including receipt processing, reachback support, ERP sourcing logic, end-of-fiscal year freight surges, direct vendor delivery (DVD) shipments, conveyance utilization, and CCP/Intermodal Hub (IMH) hold times. Four Lean Six Sigma Green Belt projects are underway to optimize Navy-owned processes that impact increased CWT.

Vendor Shipments to Sigonella

In partnership with Fleet Logistics Center (FLC) Sigonella, WSS T&D crafted a method to use MILSTRIP Signal Code “B” to avoid issues with using Signal Code “J” for vendor-sourced materiel. Vendors frequently do not perpetuate Signal Code “J” and supplementary address information, causing materiel to flow to the incorrect location. By using Signal Code “B,” routine freight routing to the proper delivery destination is assured, while the invoice in turn is routed to a supplementary address. WSS T&D has recommended to FLC Sigonella that Signal Code “B” be used whenever the Acquisition Advice Code of “H” is found during technical review.

Navy NIINs with No FLIS Freight Data

DLA recently brought to WSS T&D's attention that more than 25,000 National Item Identification Numbers (NIINs) belonging to Navy were missing freight transportation data in the Federal Logistics Information System (FLIS). Without the necessary freight transportation data in the NIIN record, DLA's Distribution Standard System (DSS) will not process and transport a requisition for these NIINs, causing long delays for customers that order them. WSS T&D analyzed demand on all 25,000 Navy NIINs and determined that only about half had demand in the last 3 years. Several of the NIINs were quite old (the oldest one was established in 1956), indicating possible obsolescence even though DLA assured the Navy that each of these NIINs has materiel on the shelf at a DLA depot. WSS T&D is currently populating the freight data fields for each of these NIINs, which should reduce or eliminate customer delays.

USS TRUMAN & USS KEARSARGE Pre-Deployment Briefs

WSS T&D recently completed meetings with the supply departments onboard the *USS Truman* and *USS Kearsarge* to test a new method of providing pre-deployment transportation information. This method relies on back-and-forth conversation and questions carried out in an informal, relaxed environment rather than the more traditional formal conference held away from the ship. WSS T&D believes this new method of pre-deployment logistics briefing will lead to better knowledge comprehension and retention by the ship's company and plans to conduct post-deployment surveys with both ships to confirm this.

Rota Direct Seavans

WSS T&D recently completed a test of shipping ocean freight from the Norfolk Intermodal Hub directly to Rota, Spain, bypassing the Theater Consolidating and Shipping Point (TCSP) in Germersheim, Germany. In partnership with FLC Sigonella, FLC Rota, and DLA Distribution Norfolk (DDNV), WSS T&D measured transit times and transportation costs for seven test container loads sent from Norfolk directly to Rota. The results were conclusive—transit times were 10 days faster, transportation costs were \$94.56 lower per measurement ton (40 cubic feet), and freight generation met DLA's 14-day Seavan economic utilization goal. DDNV has since adopted "Rota Direct" as the normal cargo routing for ocean freight into Rota, reducing customer wait time and better supporting Rota-stationed forces.

Special Requirement Code (SRC) Reviews for CY 2015

The most recent semi-annual Fifth, Sixth, and Seventh Fleet SRC reviews, completed by WSS T&D, led to a recommendation for DLA to forward position 2,235 NIINs overseas. Forward positioning reduces both CWT and transportation cost because depot stock uses less expensive ocean transportation rather than premium

air transportation for requisitions sourced from in CONUS. DLA accepted the recommendation for 1,298 NIINs and is in the process of considering 864 additional NIINs.

Fifth Fleet Supportability

WSS T&D is currently involved in collaborative efforts with Navy Central Command (NAVCENT), U.S. Fleet Forces Command (USFF), DLA, and MSC to determine new materiel support requirements for Salalah Oman. WSS T&D collected and provided demand data to the DLA Distribution J5 Team that will assist in defining infrastructure and capabilities requirements required for future Fifth Fleet logistics support.

AMS-Tac

The Automated Manifest System Tactical (AMS-Tac) automates standard DoD transportation and supply functions such as break bulk, receiving, issue, freight consolidation, redeployment, and retrograde. AMS-Tac fully integrates automated identification technology (AIT), radio frequency identification (RFID) tag, and barcode scanning/printing capabilities. AMS-Tac is the Navy's only viable tool supporting Last Nautical Mile (LNM) ITV.

MARINE CORPS

Sustainment Support to Marine Rotational Force-Darwin (MRF-D)

The Marine Corps Logistics Distribution Policy branch (LPD) collaborated with USTRANSCOM, Marine Forces Pacific (MARFORPAC [G-4 and ALD]), HQMC Logistics Policy and Capabilities branch (LPC), HQMC Deputy Commandant for Aviation (DC AVN [AL]), and DLA to establish a consistent method of moving MRF-D sustainment requisitions to Darwin, Australia, within the Defense Transportation System (DTS). This effort has resulted in USTRANSCOM's directing the AMC Global Channel Operations cell to establish bimonthly channel flights from Travis to Darwin and established DLA Defense Distribution Center San Joaquin (DDJC), vice DLA Yokosuka, as the primary requisitioning source for MRF-D.

Marine Corps Non-Nodal ITV

Marine Corps LPD, in partnership with the Army Program Director (PD) for Automated Movement and Identification Solutions (AMIS) and the Army Space and Missile Defense Command/Army Forces Strategic Command (SMDC/ARSTRAT), has finalized a service-level agreement (SLA) that addresses friendly force tracking (FFT) and position location information data services. The completed agreement establishes the roles, responsibilities, and operational support procedures needed to fully execute FFT activities and continue the Marines Corps Non-Nodal ITV/Last Tactical Mile program. The Non-Nodal ITV capability is the

Marine Corps solution for bridging the gap between nodal locations, while providing greater flexibility, a smaller footprint for the Marine Air Ground Task Force (MAGTF), and a more cost-effective solution. In addition, information collected from these devices will be used to improve situational awareness, enable C2, and reduce or prevent fratricide incidents for the operational forces.

Modernization Efforts for the Deployable Cargo Management Corps

Marine Corps LPD is developing requirements to modernize the Deployable Cargo Movement Operations System (D-CMOS) as a replacement for the legacy cargo receiving and distribution system—Automated Manifesting System-Tactical (AMS-TAC), scheduled to sunset in FY18. Currently, D-CMOS is the single shipper system used at Marine Corps bases and stations for processing peacetime cargo. D-CMOS interfaces with required DoD systems for ITV and financial transactions. The Marine Corps, in conjunction with the Navy (NAVSUP GLS), is leading a D-CMOS modernization effort for a joint solution. The updated D-CMOS version will include an improved user platform and communications, and additional functionality to support deployed operations, all while reducing the size and cost of the current LOG IT Portfolio.

AIR FORCE

Fastest and Most Reliable Carrier

The Fastest and Most Reliable Carrier is a warfighter-requested and -sponsored Air Force program using a weekly review of carrier performance, including lane, destination, ITV, transit time, delays, and customer service to determine the fastest and most reliable carrier for a given destination. From extensive evaluation by receiving customers at each Department of Defense Activity Address Code (DODAAC) or location, the carriers listed below proved to be the fastest and most reliable for their corresponding locations.

DODAAC	Location	Carrier
FB4811	Al Dhafra, UAE	FedEx
FB4804	Al Udeid AB, Qatar	DHL, FedEx
FB5820	Ali Al Salem AB, Kuwait	FedEx, DHL
FB5814	Bagram AB, Afghanistan	DHL
FB5807	Djibouti, Djibouti	DHL
FB5816/FE5816	Eskan Village, Saudi Arabia	US Postal Service: Letter to 70 pounds DHL, FedEx: 71-300 pounds
FY4911	Jalalabad, Afghanistan	FedEx
FB5804	Manas AB, Kyrgyzstan	UPS
FB5685/FB5879	Incirlik AB, Turkey	DHL, FedEx,

Service-Specific Materiel Distribution Accomplishments

DODAAC	Location	Carrier
FB5806	Kandahar, Afghanistan	DHL
FB5891	Kuwait City, Kuwait	UPS, FedEx
FB4400/4486/5825	Lajes Field, Azores (Portugal)	Fed Ex
FB4856	Manama, Bahrain	
FY5806	Shindand, Afghanistan	FedEx
FB4668	Thumrait, Oman	DHL
FB5819	Al Jaber AB, Kuwait	DHL
FB5808/FE5808	Al Azraq AB, Jordan	DHL, FedEx

Appendix D

Metrics and Performance Development

Accurately measuring the performance of the materiel distribution function has been an ongoing DoD priority. It continues to develop, implement, and refine a suite of distribution metrics that will render a comprehensive view of materiel distribution performance and assist in the overall management of the distribution enterprise. In support of this overarching intent, this appendix discusses the current state of the materiel distribution metrics development process, defines the materiel distribution Enterprise Metrics Suite recommended as the mechanism for measuring end-to-end materiel distribution performance, and describes recommendations and a path forward for DoD materiel distribution improvement.

STATE OF DOD DISTRIBUTION METRICS

How many distribution metrics exist throughout DoD is difficult to say. The JDDE COI undoubtedly creates and uses several metrics at various levels to help their organizations' better understand the performance of the distribution function and make key decisions. At a minimum, USTRANSCOM, AMC, SDDC, DLA, and all the Services have metrics. Some are well known and shared across the JDDE, while others are strictly for internal use.

With so many materiel distribution metrics in use (either formally or informally) the difficulty has always been to identify the metrics that are manageable (the right number—not too many, not too few), are actionable (offering the ability to make informed management decisions at various levels based on the metric values), are supported by high-quality data (reliable, frequently updated/refreshed, from trusted sources), and can be used to comprehensively measure materiel distribution performance across the entire distribution enterprise.

To date, DASD(SCI) has executed the most complete effort to identify, categorize, and utilize the JDDE's most informative and valuable materiel distribution metrics. Their efforts can be broadly described by two subordinate initiatives: the establishment of the Supply Chain Metrics Group (SCMG) and the creation of the *Supply Chain Metrics Guide*.

The purpose of the SCMG is to monitor the efficiency and effectiveness of the entire DoD supply chain using various metrics. The SCMG meets monthly to discuss and recommend enhancements to DoD supply chain metrics. The SCMG

also resolves inter-Service metrics issues through direct coordination among group members and formulates solutions to issues presented to the group.¹

Supply Chain Metrics Guide

The *Supply Chain Metrics Guide* (“the guide”) is the reference document listing a complete set of standardized DoD-wide supply chain metrics, together with their recommended use for monitoring supply chain performance. The guide contains a broad suite of metrics selected to assess the effectiveness and efficiency of the entire DoD supply chain. It describes each metric, including its definition, business value, goals, and targeted performance trends. Detailed explanations of the computations associated with each metric and the key relationships to other metrics are included as well. The guide provides direction for proper metric reporting as well as the manner in which the metric should be displayed and used. The guide also includes separate sections covering the following:

- Metric selection criteria to evaluate the success of improvement initiatives
- The relationship of metrics to major supply chain attributes and how they measure the degree to which the supply chain exhibits those attributes
- The use of metrics to monitor and assess supply chain performance against defined business objectives.²

As materiel distribution is a just one component of the entire supply chain, some metrics in the guide are distribution related, while others measure other supply chain attributes and functions. There are two groups of metrics in the guide partially or entirely comprising materiel distribution metrics—the *enterprise metrics* and the *distribution effectiveness metrics*.

ENTERPRISE METRICS

The guide defines 23 enterprise metrics, which monitor performance across all supply chain functions and hierarchies. They seek to provide leadership with key information necessary to assess the overall health of the DoD supply chain. Due to the scope and complexity of DoD’s supply chain, a complete assessment of its performance requires a review of all 23 enterprise metrics and their interrelationships. Performance cannot be adequately determined by looking at the metrics in isolation: they must be assessed in concert with the performance of other related metrics. Therefore, the guide also describes how each targeted metric should be reviewed in conjunction with its related metrics.

¹ The SCMG was established by the Supply Chain Executive Steering Committee (SCESC) per authorities assigned to them in their charter of October 7, 2011.

² Deputy Assistant Secretary of Defense for Supply Chain Integration (DASD SCI), *Supply Chain Metrics Guide*, in approval for publishing.

DISTRIBUTION EFFECTIVENESS METRICS

The guide contains 11 distribution effectiveness metrics. The development of these metrics began as part of the Strategic Network Optimization (SNO) initiative. These metrics were established to measure DLA's effectiveness at optimizing the global distribution network in support of its customers. The SNO goal was to use the metrics to measure and improve responsiveness, reliability, and cost-effectiveness—key supply chain attributes that drive materiel distribution effectiveness.

The guide not only contains a dichotomy between enterprise and distribution effectiveness metrics but also one that recognizes both outcome and diagnostic metrics. Diagnostic metrics are considered subordinate to outcome metrics because the latter measure the result of *how* the supply chain is performing, while the former attempt to address *why* or *where* an issue may exist that has or could have an impact on the output and therefore needs attention. While both metrics are important, outcome metrics are recognized as preeminent because they describe how the warfighter is experiencing the distribution system.

Supply Chain Metrics Guide Metrics Analytical Framework

The guide stresses that a comprehensive assessment of supply chain performance requires a review of *all* the enterprise metrics and their interrelationships. Understanding these interrelationships requires a framework with which to categorize metrics and illustrate their correlations and dependencies. The guide's Metrics Analytical Framework accomplishes this by linking each metric to one of the following desired attributes for supply chain management:

- *Materiel readiness.* Ability of the supply chain to support weapon systems in undertaking and sustaining their assigned missions at planned peacetime and wartime utilization rates. Supporting materiel readiness is the mission imperative of the end-to-end supply chain.
- *Reliability.* Dependability and consistency of the supply chain to deliver required materiel support at a time and place specified by the customer. Reliability is key to DoD customer confidence in the supply chain.
- *Responsiveness.* Ability of the supply chain to respond to customer materiel requests by providing the right support when and where it is needed. For DoD, responsiveness is the speed at which the supply chain fulfills warfighter needs. This attribute is most representative of the customer's perspective of the supply chain.
- *Cost.* Price paid for the supply chain resources required to deliver a specific performance outcome. Cost effectiveness is key to right-sizing inventory investment and controlling supply chain costs.

- *Planning and precision.* Ability of the supply chain to accurately anticipate customer requirements and plan, coordinate, and execute accordingly. Planning and precision are key to overall supply chain management and their effectiveness affects all other attributes.

Figure D-1 shows this Metrics Analytical Framework, along with a depiction of how it supports the business goal of improving distribution effectiveness.

Figure D-1. Supply Chain Metrics Guide Metrics Analytical Framework

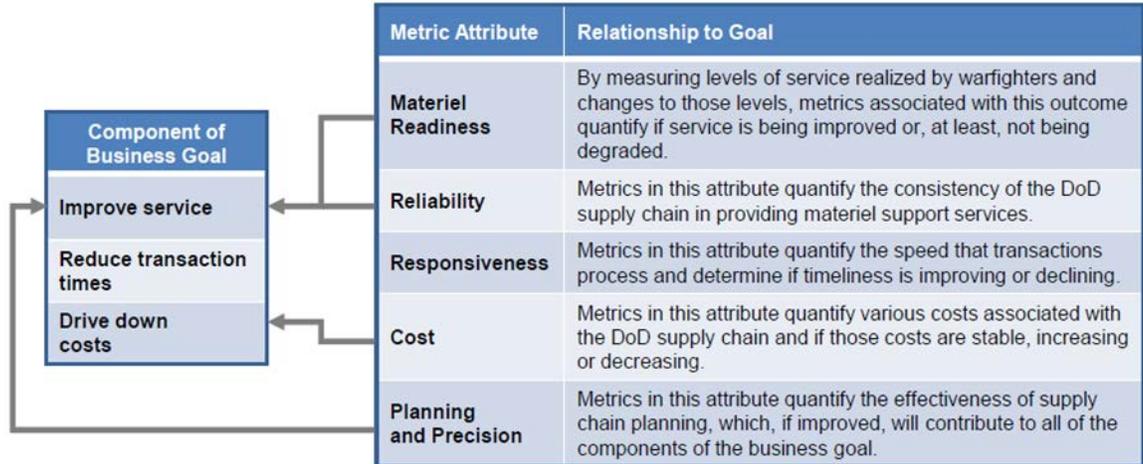
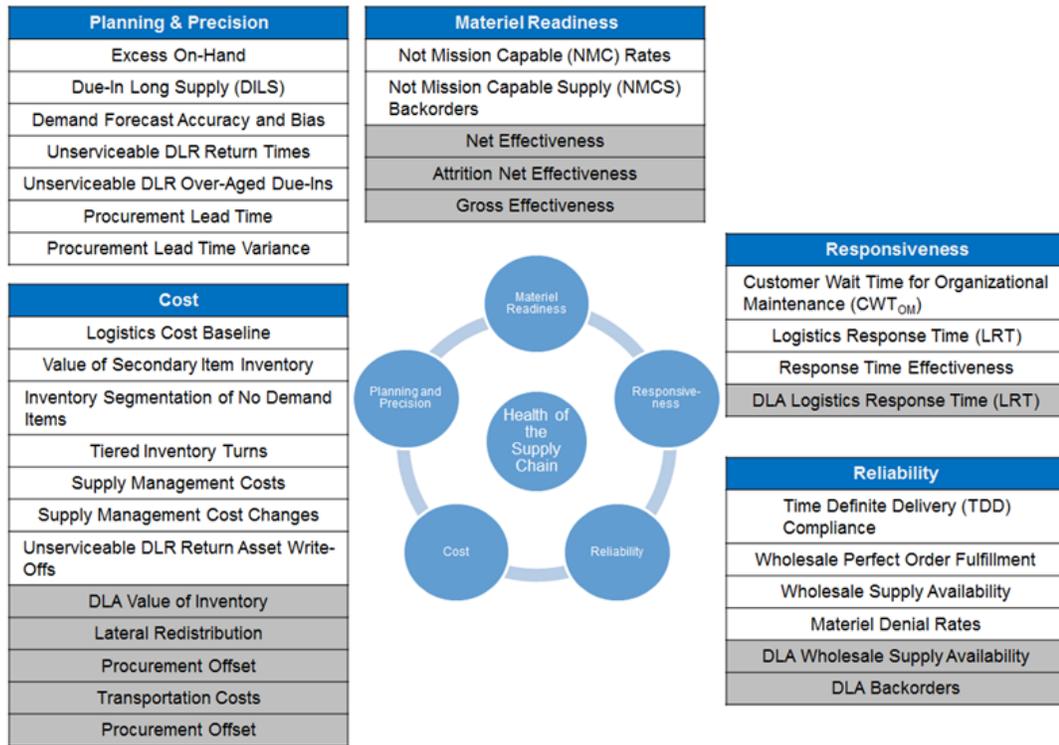


Figure D-2 shows the total list of enterprise metrics and distribution effectiveness metrics, along with their place in the Metrics Analytical Framework (the specific supply chain performance attribute under which they fall). Distribution effectiveness metrics are shown in the shaded cells and enterprise metrics in the unshaded cells.

Figure D-2. Enterprise and Distribution Effectiveness Metrics



JDDE Performance Metrics Framework for Sustainment Distribution

The *JDDE Performance Metrics Framework for Sustainment Distribution* (PMF_{SD}) was a report published by Computer Sciences Corporation in September 2006 for USTRANSCOM. The metrics development framework introduced in this report is compelling for its focus on the warfighter. This focus satisfies a theme proposed by the SCMG, that materiel distribution, and the metrics that measure materiel distribution effectiveness, must ultimately serve the warfighters.

The DWG consensus was that a warfighter-centric focus was essential in determining viable materiel distribution metrics. Therefore, it investigated how the PMF_{SD} could be used, in addition to the guide’s Metrics Analytical Framework, to produce a validated set of distribution metrics. One of the most compelling aspects of the PMF_{SD} study was the scope of the warfighter interviews that identified needs. Figure D-3 depicts the tactical, operational, and strategic organizations across the Services that lent a voice to the PMF_{SD} effort.

Figure D-3. Extensive Interviews Informed PMF_{SD} Development

		360° View					
		CCMD	Air Force	Army	Navy	USMC	
Strategic		<ul style="list-style-type: none"> J4 	<ul style="list-style-type: none"> Air Force Command and Staff Channels A4 USAFE PACAF 	<ul style="list-style-type: none"> Army Command and Staff Channels USARPAC G4 	<ul style="list-style-type: none"> Navy Command and Staff Channels OPNAV Naval Transportation Support Center System Commander Type Commander Naval Expeditionary Combat Command Naval Operations Logistics Support Center 	<ul style="list-style-type: none"> USMC Command and Staff Channels MARFORPAC G4 Marine Expeditionary Forces 	
	Operational		<ul style="list-style-type: none"> DDOC Service components 	<ul style="list-style-type: none"> CAF/MAF-LSC RSS 	<ul style="list-style-type: none"> G4 Sustainment Commands 	<ul style="list-style-type: none"> Service Command Channels Fleet Priority Material Office Fleet Support Staff Destroyer Squadron Supply Officer Naval Sea Support Center Fleet and Industrial Supply Center 	<ul style="list-style-type: none"> Marine Air Wing Logistics Modernization Team
		Tactical	<ul style="list-style-type: none"> The CCMD tactical perspective was captured through interviews with the Service components that comprise the COCOM's tactical force 	<ul style="list-style-type: none"> Mission Support Group Logistics Readiness Squadron Maintenance Group Munitions Squadron 	<ul style="list-style-type: none"> Corps Support Group BDE support BN Unit S4s and maintenance personnel 	Ship-level: <ul style="list-style-type: none"> Supply Officers and Storekeepers Maintenance personnel Supply Ship personnel Unit-level "Sea Bees" 	<ul style="list-style-type: none"> Marine Expeditionary Units Marine Aviation Logistics Squadron Aviation Logistics Department

Figure D-4 tallies the number of interviews in support of PMF_{SD} development.

Figure D-4. PMF_{SD} Interview Tally

	Echelon			
	Strategic	Operational	Tactical	Total
Air Force	27	25	44	96
Army	5	11	15 / 32*	31 / 63**
Marines	10	12	14	35
Navy	12	17	13	42
CCMD	13	2 / 9*	n/a	15
Total	67	67 / 76**	86 / 118**	220 / 261**

*Interviews conducted as part of the Army Theater Distribution Study

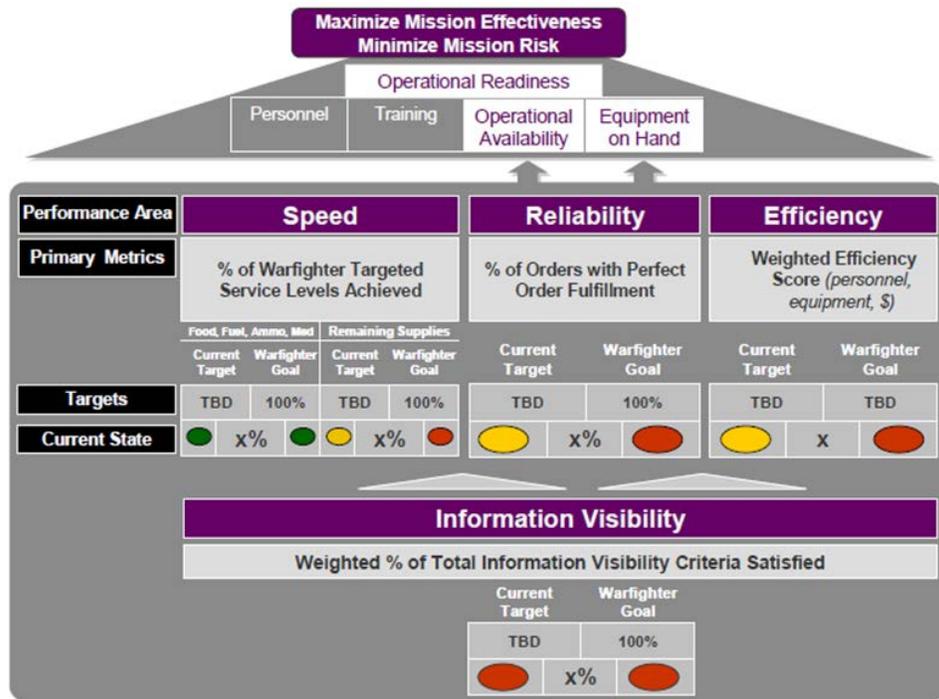
**Totals with Army Theater Distribution Study interviews included.

The authors used feedback from these interviews to develop materiel distribution metrics, which clearly described JDDE performance from the warfighter's perspective. These outcome-based metrics were then codified in the PMF_{SD}. As Figure D-5 shows, the PMF_{SD} comprises four attribute components that relate to

materiel distribution performance from the standpoint of the warfighter: speed, reliability, efficiency, and information visibility.

- *Speed*. Time between when the supply request is placed and the unit’s requirement to have that item on hand.
- *Reliability*. Consistent delivery of the product to the right place, in the right condition, and on the agreed-upon delivery date.
- *Efficiency*. Ability to meet resource constraints or requirement limitations in personnel, equipment, and financial resources.
- *Information visibility*. Ability to provide consistent, accurate, and accessible information to monitor supply chain and materiel distribution operations and inform assessments of the operational impacts of those operations.

Figure D-5. PMF_{SD} Attribute Components



The DWG determined the PMF_{SD} should be adopted as the foundation for identifying a list of metrics based on the four PMF_{SD} attribute components. Metrics for the speed and reliability attributes were already represented within the universe of 34 enterprise and distribution effectiveness metrics contained in the guide, while a metric for information visibility was initially seen as conceptual since there was no direct corresponding metric identified in the guide. In addition, no specific

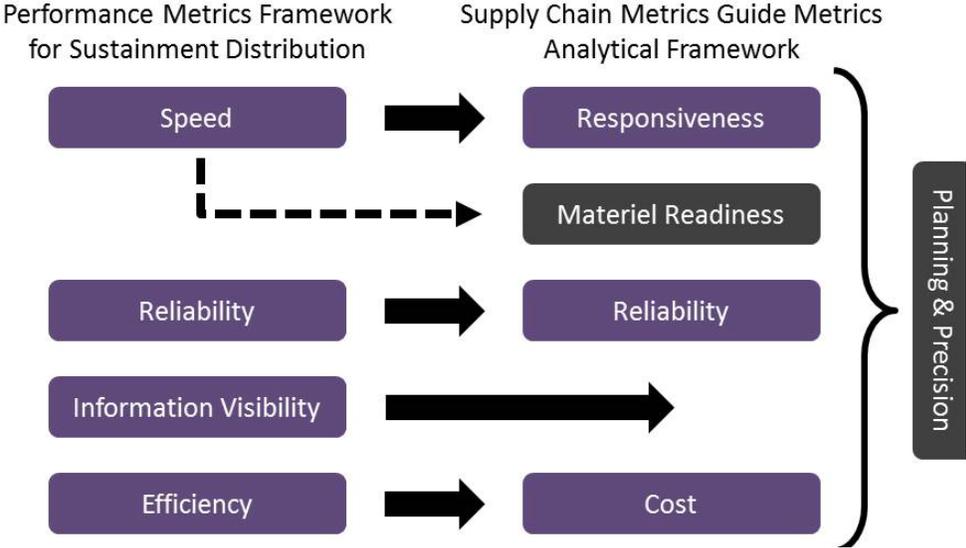
metric was initially identified from those in the guide to represent the cost/efficiency attribute, but a cost metric is being proposed for development known as Finished Product Logistics Cost.

The DWG noted common themes shared between the PMF_{SD} and the guide’s Analytical Framework and decided to utilize the language of the guide’s Analytical Framework as much as possible while adhering to ideas found in the PMF_{SD}.

Reliability is found in both the PMFSD/Analytical Frameworks, and speed and responsiveness were seen as synonymous. Cost and efficiency also map together well across both frameworks, given that the PMF_{SD} lists cost as a crucial component of efficiency.³ Information visibility is not easily mapped to any of the categories in the guide’s Analytical Framework, and therefore its description from the PMF_{SD} remained unchanged. There is no PMF_{SD} category similar to materiel readiness. However, materiel readiness is viewed as highly influenced by responsiveness, which, in turn, is analogous to speed in the PMF_{SD}.

Figure D-6 shows the basic linkage between the PMF_{SD} and the guide’s Metrics Analytical Framework.

Figure D-6. Linkages between the Two Metrics Development Frameworks



This linkage allowed the DWG to combine the best elements of both metrics development frameworks to develop the materiel distribution Enterprise Metrics Suite.

³ Computer Sciences Corporation, *Joint Deployment and Distribution Enterprise (JDDE) Performance Metrics Framework for Sustainment Distribution*, O’Fallon, IL, 2006.

METRICS AND PERFORMANCE SUB-WORKING GROUP APPROACH AND METHOD

The MPWG was formed to research and recommend metrics that should be used to measure end-to-end materiel distribution performance and make associated recommendations for their adoption and use by the JDDE community. The MPWG included members from the following JDDE organizations:

- DASD(SCI)
- OSD Transportation Policy
- DLA J34 Metrics
- DLA J34 Transportation Policy
- DLA, DORRA
- Air Force, 635 SCOW/LGT-ACA
- Army, LOGSA
- Navy, NAVSUP WSS
- USMC, MARCORLOGCOM.

To develop the validated list of required distribution metrics, the MPWG started with the metrics contained in the guide. It also wanted to use both the PMF_{SD} and the guide's Metrics Analytical Framework to evaluate candidate metrics against the materiel distribution performance attributes contained in (and linked between) those frameworks. It understood the importance of identifying a subset of metrics that met the DWG's goals of being *manageable* through a suitable governance structure, *actionable* at various levels, derived from *high-quality data sources*, and *comprehensive* enough to measure the end-to-end materiel distribution processes, as well as able to reveal performance gaps and suggest root causes and solutions for closing them.

As the MPWG accomplished its work, it also looked for any gaps in DoD's current distribution function metrics and performance assessment process. As gaps were identified, it crafted recommended action steps intended to close or alleviate them.

The MPWG members, with assistance from their parent organizations, also completed a metrics survey to deepen their understanding of the operational value of each of the guide's metrics. Comprised of five parts, the survey sought to gauge the relative value of each metric to an organization and determine what the JDDE

COI wanted to know about materiel distribution across each of the four PMF_{SD} attribute categories:

- Part 1 asked respondents to rate the 23 enterprise metrics and 11 distribution effectiveness metrics on a five point Likert scale (strongly disagree, disagree, neutral, agree, and strongly agree) according to the statement: *This metric is (or would be) useful for my organization as part of a larger effort aimed at comprehensively measuring distribution performance, identifying gaps, defining root causes, developing solutions, and applying corrective measures.*
- Part 2 asked respondents to suggest other *existing* metrics they thought might assist in measuring materiel distribution performance, identifying gaps, defining root causes, developing solutions, and applying corrective measures.
- Part 3 asked respondents to describe what their organization wanted to know about speed, reliability, visibility, and efficiency.
- Part 4 asked respondents to weight Speed, Reliability, Visibility, and Efficiency in terms of importance to their organization.
- Part 5 asked respondents to make additional comments as appropriate.

While the number of survey responses were insufficient for any detailed statistical analysis, the results were effective in steering metrics discussions and ultimately in determining which metrics would go forward as the validated list.

MATERIEL DISTRIBUTION ENTERPRISE METRICS SUITE

The final validated list of metrics developed and recommended by the MPWG is referred to as the materiel distribution *Enterprise Metrics Suite*. The suite is designed to measure end-to-end performance across the distribution enterprise, while meeting the development framework performance attributes as well as the requirements to be manageable, actionable, and derived from quality data sources.

The suite contains two *responsiveness* measures: time definite delivery (TDD) and customer wait time for organizational maintenance (CWT_{OM}).

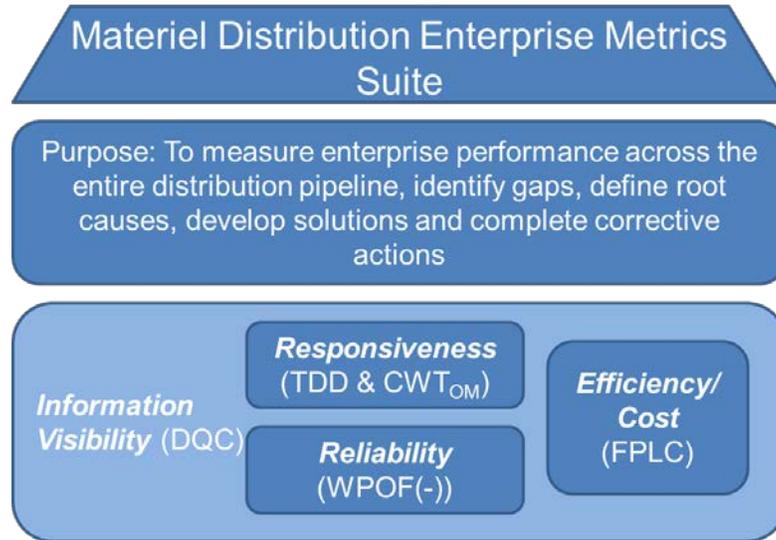
The suite contains one *reliability* measure: a modified version of wholesale perfect order fulfillment (WPOF(-)).

The suite accommodates *information visibility* through a newly proposed metric called “data quality compliance” (DQC), which is designed to assesses the overall quality of the underlying data elements supporting the other metrics: CWT_{OM}, TDD, and WPOF(-).

The suite includes one enterprise *cost/efficiency* metric, which will require a significant development effort: Finished Product Logistics Cost (FPLC).

Figure D-7 graphically depicts the Enterprise Metrics Suite.

Figure D-7. Materiel Distribution Enterprise Metrics Suite



Although the Suite only includes five metrics (two of which are new and not currently part of the metrics in the guide), this does not imply the remaining metrics (the full list of enterprise and distribution effectiveness metrics) have no value. As already discussed, many of these metrics measure aspects and functions of the overall DoD supply chain other than materiel distribution. Some of the metrics are diagnostic in nature and therefore have value as a tool for uncovering the causes of performance shortfalls revealed by the outcome metrics. Many have value for measuring progress against ongoing performance initiatives at specific agencies (such as those developed to support the DLA SNO initiative). Although useful at various levels within the JDDE, many are simply not inclusive enough to be used for end-to-end distribution process measurement. The MPWG focused its efforts on selecting or developing a usable suite of *enterprise-level* metrics that provide information about the performance of the distribution enterprise as a whole.

Each metric in the suite is described in detail in the next section, including definitions, standards, data sources and quality, ownership and maintenance, and suggestions for further improvement.

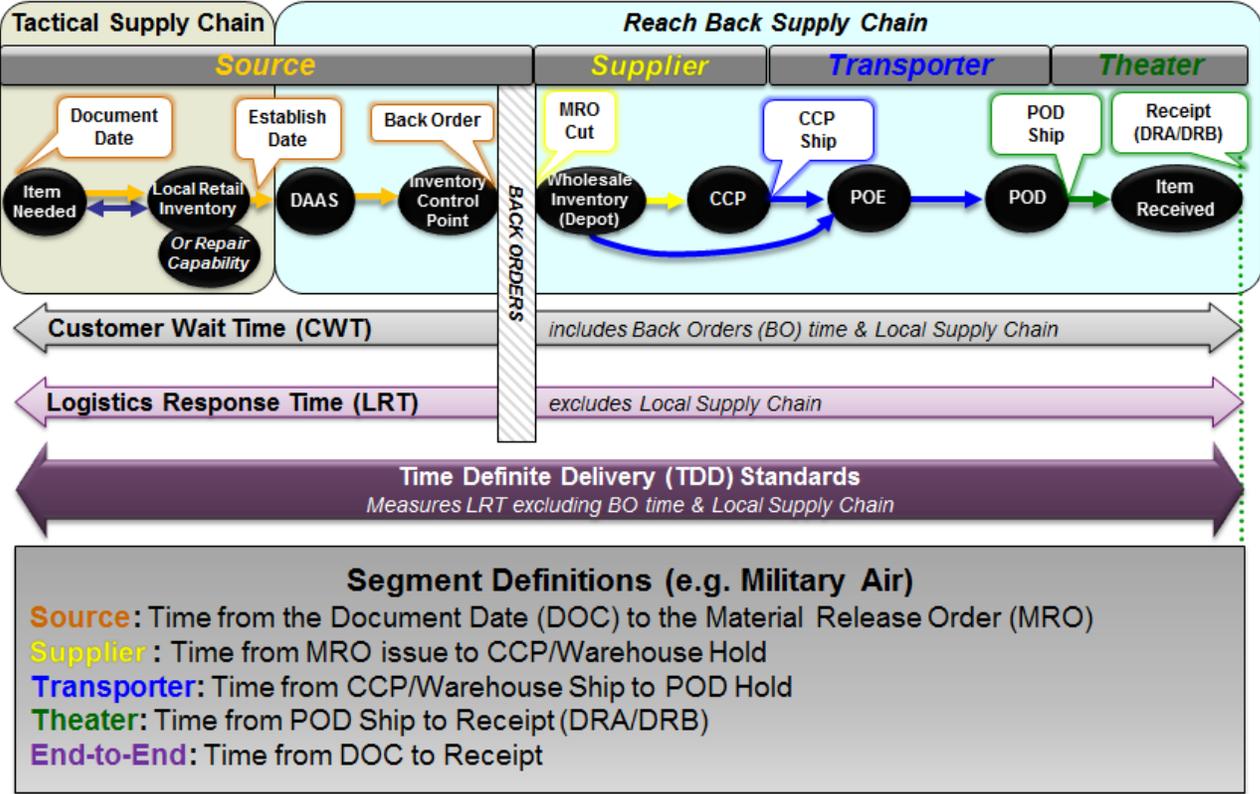
Responsiveness: TDD and CWT_{OM}

The metrics survey and subsequent discussion among members of the MPWG determined that responsiveness is best measured by TDD and CWT_{OM} compliance. Taken together, these metrics cover key aspects of the total materiel distribution pipeline since, at a high level, the materiel distribution pipeline can be thought of

as having both retail and wholesale components, with retail transactions being those that the Services fill themselves and wholesale transactions being those that are sourced from DLA depots, direct from a vendor, or a similar solution other than the requisitioning service.

CWT_{OM} includes both retail and wholesale requisitions for organizational maintenance. These are arguably DoD's most important requisitions because they link supply chain performance to non-mission capable rates. TDD covers only wholesale requisitions for various classes of supply, but serves as a valuable metric for assessment of the various segments of the materiel distribution pipeline, especially supplier, transportation, and theater distribution. Figure D-8 shows the relationship between CWT_{OM} and TDD.

Figure D-8. Comparing CWT_{OM} and TDD



RESPONSIVENESS: TDD DESCRIPTION

TDD evaluates how well the DoD supply chain is meeting the delivery standards negotiated between providers and customers. These standards address source, supplier, transporter, and theater segments of the supply chain. Standards vary by customer location and transportation mode, but the goal is for the total time between initiation of an order and delivery of materiel (SSA receipt) to be within the standard 85 percent of the time (excluding any backorder time). TDD provides

value by quantifying the *reliability* of the supply chain in meeting negotiated delivery times.⁴ Globally, it is computed as the percentage of requisitions meeting TDD standards, over total requisitions. TDD can be calculated at lower levels as well (such as by CCMD, transportation mode, country/region, or service).

DASD SCI provides *Metric DNA Tables* for all the guide’s metrics, designed to describe the full “pedigree” of each metric. Figure D-9 shows the Metric DNA Table for TDD.

Figure D-9. TDD Metric DNA

 Time Definite Delivery (TDD) Compliance DNA		STATUS OF SCMG ACTIONS			
		COMPLETED	PENDING COMPLETION	PROBLEM	
DEFINITION	Outcome Metric: The concept that, within a specified degree of probability, the logistics system is capable of delivering required materiel to the customer within a given period of time. As a metric, it measures the count and percentage of shipments that meet the time definite delivery (TDD) standards for a given combatant command and transportation mode. For this metric, backorder time is excluded.	DEFINITION IN POLICY	Definition is in both draft DODM 4140.01-V10 and Supply Chain Metrics Guide		
SUPPLY CHAIN ATTRIBUTE	Reliability (Internal): The DoD TDD standards provide delivery performance target by combatant command, region within COCOM and transportation mode as dictated by the customer’s priority.	COMPUTATION	The metric is computed as the percent of requisitions that meet their TDD standard over the total number of requisitions. <ul style="list-style-type: none"> • USTRANSCOM leads the forum the recommends rules on the requisitions to be included in its computations – primarily but not limited to Class IX items. • USTRANSCOM leads annual negotiation of standards with participation by DoD Components 		
BUSINESS VALUE	This metrics quantifies the reliability of the DoD supply chain in meeting negotiated times when responding to customer requisitions.	DATA SOURCE	DPO JDDE Metric Executive Dashboard (source data is Strategic Distribution Database)		
		OSD DATA REQUIREMENT	Frequency: Monthly collection from DPO Distribute.mil website Content: DPO JDDE Metric Executive Dashboards and associated LRT statistics		
		GOALS AND TREND ANALYSIS	Goals: 85% of deliveries meet their TDD standard. Trend: A downward trend in TDD compliance is negative while an upward trend is positive.		
		DISPLAY	Global, CONUS, ARCENT, and MARFORCEN dashboards with additional statistical displays.		

RESPONSIVENESS: TDD STANDARDS

TDD has a series of standards, applied and assessed globally on the basis of a requisition’s mode of transportation and country/region destination. These transportation mode/destination groupings are referred to as integrated distribution lanes, or IDLs. It is along these IDLs that the TDD attempts to achieve a performance goal of 85 percent of requisitions meeting their established IDL TDD standard.

Obviously, DoD has many locations and multiple modes of transportation, so it follows that there should be many IDLs and associated TDD standards. In fact,

⁴ Although labeled a reliability metric in the *Supply Chain Metrics Guide* metric DNA, TDD is considered a responsiveness metric for purposes of the suite. By excluding backorder and local supply chain times, the metric focuses on how well the materiel distribution system is *responding* to meet the negotiated provider/customer delivery standards.

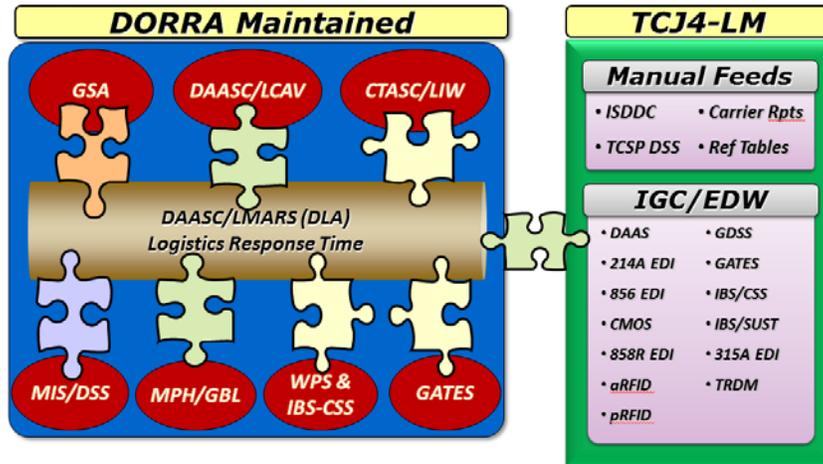
there are currently 111 defined TDD standards accounting for various transportation modes and countries across the CCMDs. These 111 TDD standards are created by consensus across the JDDE at an annual event, the TDD Conference, which includes participation by CCMDs, USTRANSCOM, AMC, SDDC, DLA, GSA, the Joint Staff J4, the Military Services, and others. Consensus IDL standards developed at the TDD Conference are then approved by the Distribution Steering Group (DSG).

Although the IDL TDD standards are developed by consensus, the performance goal of having 85 percent of all requisitions meet those standards is not. The 85 percent performance target has simply been “set” for quite some time with little justification or knowledge within the JDDE COI of its origins or rationale. Some within the JDDE COI feel that 85 percent was set to adequately account for “normal” variability in a single performance parameter, some believe it allows for egregious outliers—the occasional one-off performance anomaly, and others believe it is simply close to what the customer “feels” is an appropriate performance standard. However, many members of the JDDE COI continue to question the appropriateness of this target in light of its rather obscure origins and the fact the Department consistently falls short of it. It is anticipated that once actions are taken to increase the fidelity and granularity of TDD, as recommended in the TDD Suggestions for Improvement section, the coarseness of measurement that currently restricts TDD from meeting the 85 percent standard will largely be remedied. After these TDD measurement refinements are in place and more performance data is gathered, the appropriateness of the 85 percent performance standard can be reexamined.

RESPONSIVENESS: TDD DATA

The current data source for TDD is the Strategic Distribution Database (SDDDB) provided by DLA’s Office of Operations Research and Resource Analysis (DORRA). Developed by RAND in 2001 to evaluate distribution performance, the SDDDB is a collection of distribution-related data pulled monthly from several DoD databases and systems. The SDDDB is continually evaluated by USTRANSCOM J4 analysts and data team members with an eye on improving data quality and visibility. Figure D-10 illustrates the systems feeding data into SDDDB, as well as which data are maintained by DORRA and which are later added by USTRANSCOM’s J4 Metrics and Analysis Branch (TCJ4-LM).

Figure D-10. SDDB Data Feeds



RESPONSIVENESS: TDD MAINTENANCE AND ACTION

USTRANSCOM TCJ4-LM is responsible for the maintenance of TDD and any actions related to TDD process improvement. As previously noted, TDD changes (by IDL) are developed at the annual TDD Conference and approved by the DSG.

Due to the importance of TDD to the warfighter, sustainment distribution analysts at USTRANSCOM J4 conduct formal quarterly reviews of distribution performance with each supported CCMD. These distribution performance reviews (DPRs) present sustainment distribution data and associated analysis and solve distribution issues with the assistance of the JDDE community. The Defense Collaboration Services (DCS) delivers an effective combination of chart presentations, audio commentary, and text enabled chat to support all DPRs. Issues that cannot be resolved during the DPR are forwarded to the DSG for action. The expected attendance for each DPR, as approved by the DSG, is shown in Figure D-11 (each CCMD attends just its own DPR).

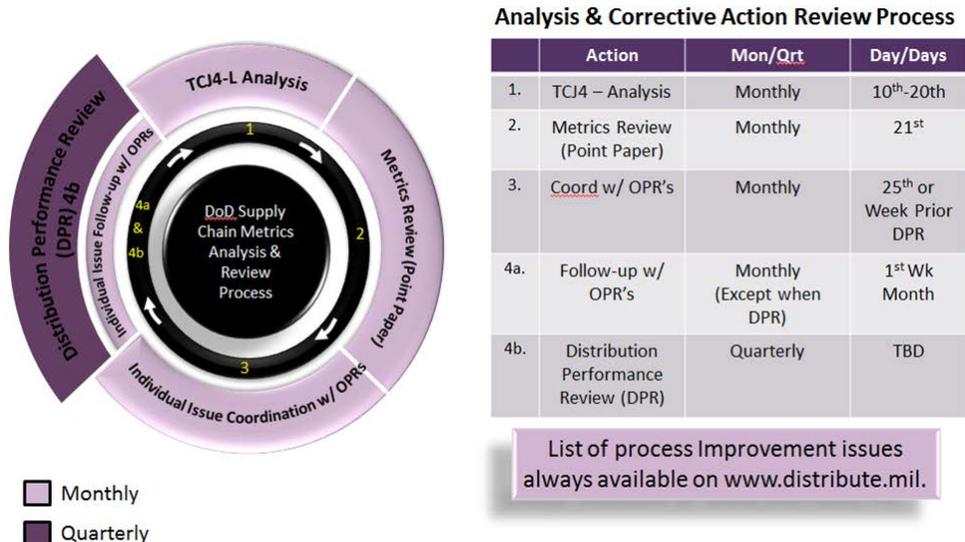
Figure D-11. Distribution Process Review Participants

DPR Organizational Attendance

- OSD-Acquisition, Technology, and Logistics
- OSD-Supply Chain Integration
- Joint Staff/J4
- DLA
 - DLA J3, DLA Distribution J3, DORRA, OCONUS Distribution Centers
- Army
 - Army G4
- Air Force
 - HQ USAF/A4, AFMC/A4, AFM 635 SCOW
- Navy
 - NAVSUP
- Marines
 - HQ USMC, MARCORLOGCOM
- AFRICOM
 - AFRICOM J43
- CENTCOM
 - CENTCOM J4
- EUCOM
 - EUCOM J4, USAFE, USAREUR G4
- NORTHCOM
 - NORTHCOM J4
- PACOM
 - PACOM J42, COMPACFLT, PACAF/A4R
- SOUTHCOM
 - SOUTHCOM J4/SOUTHCOM DDOC
- SDDC
 - SDDC-G9 QA Division
- Air Mobility Command
 - AMC/A4T
- 618 AOC (TACC)
 - 618 AOC (TACC)/XOG
- USTRANSCOM
 - TCJ3-W, TCJ4-L

DPRs are also the forums where TDD process improvement begins. Process improvement issues can be identified by USTRANSCOM J4 analysts or by any DPR participant. When a TDD process issue is identified, USTRANSCOM J4 chooses an OPR to lead an investigation and report back in the next DPR. The issue is listed in a monthly point paper and published on www.distribute.mil in the Distribution Performance Analysis community. Although this process works quite well to resolve most TDD process issues, issues can be elevated to the DSG level if necessary. Figure D-12 shows the complete cycle from data analysis to DPR with process improvement milestones.

Figure D-12. DPR Data Analysis/Process Improvement Cycle



RESPONSIVENESS: TDD SUGGESTIONS FOR IMPROVEMENT

TDD is an effective metric that can lead to true root cause issue identification and process improvement. However, as with any metric, there is room for improvement. The MPWG identified five areas that warrant additional investigation:

1. The level of detail that an IDL is capable of describing
2. Relating TDD to both provider capability and customer operational needs
3. The classes of supply evaluated by TDD
4. Robustness and accessibility of the SDDB
5. The appropriateness of the 85 percent performance standard.

Suggestions for addressing area 5 are discussed in the TDD Standards section. Once the other areas for improvement have been investigated and resolved, TDD performance data should be reviewed again to see whether the 85 percent standard is being met with greater frequency when applied against the higher levels of measurement granularity achieved by implementing areas 1, 2, and 3.

Area 1. There are presently 111 TDD standards based on unique IDLs that describe a specific mode (e.g., military air) and location (e.g., a country or region) for shipment. This number of standards works well for executive discussion purposes and as a reasonable amount for negotiation discussions at TDD Conferences. However, TDD process improvement really happens at a level below the IDL, known as the “stream.” A stream adds a specific physical origin (e.g., a single DLA depot) to an IDL and specifies whether the receiving unit is shore based or afloat.

Discussion of what warrants an appropriate level of responsiveness should be focused on the stream level, for which only the much coarser IDL standard is currently applied. Responsiveness would be enhanced significantly by developing and applying more stream-specific standards, which could then be aggregated into more accurate IDL analysis

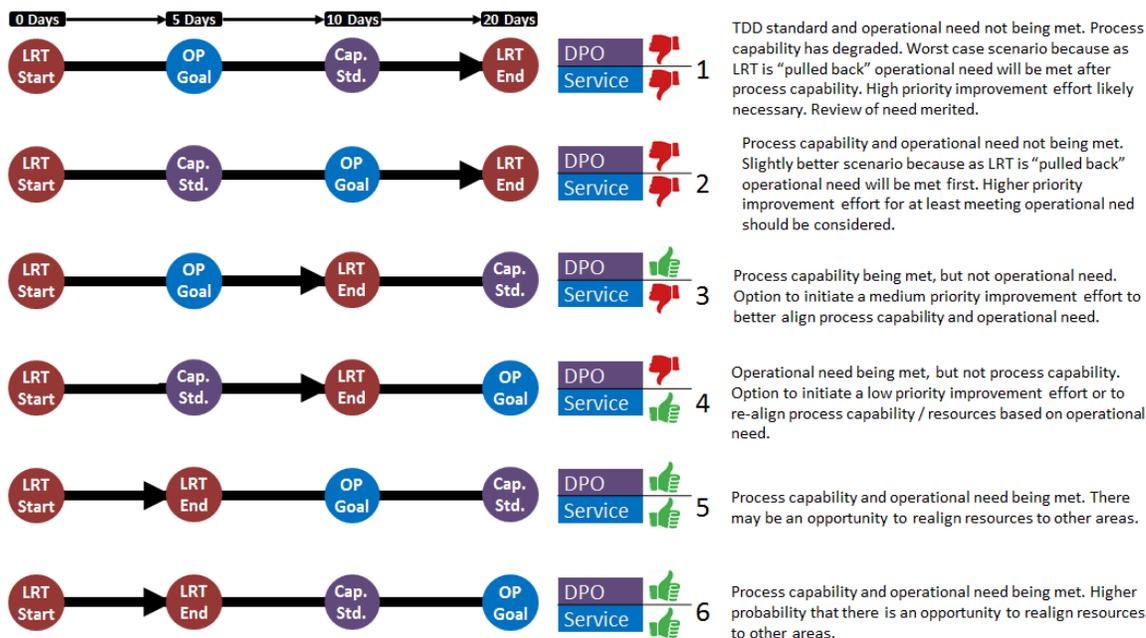
Area 2. Current TDD standards are really a compromise between *provider capability* and *customer operational needs*. This dichotomy occurs because the TDD Conference invites all members of the JDDE (providers and customers) to provide input into what the standards should be. Logically, providers are driven by their current capabilities and contracts, while customers are driven by the need to enhance operational readiness. This results in compromise standards that do not address the goals of either side very well.

The JDDE COI would be better served by evaluating provider capability *contrasted* with responsiveness expectations based on customer operational needs.

The provider community should prescribe capability standards by stream (approximately 2,000 streams have been identified) and that the customer community (Services/CCMDs) should prescribe separate goals based on their operational needs.

Figure D-13 explains the rationale for splitting TDD in more detail. It describes six possible outcomes derived from separating TDD into provider capability standards and customer operational need goals. The figure depicts a hypothetical 20-day timeline during which a requisition starts and ends (red circles) at various times—5 days, 10 days, or 20 days. Applied to each timeline are a provider capability standard (purple circle) and an operational need goal (TDD in blue circle). An overall TDD assessment (red thumbs-down or green thumbs-up) and discussions for each of the six outcomes are shown on the right side of the figure.

Figure D-13. A Case for Developing Separate Provider and Customer TDD Measures



Scenarios 1 and 2 meet neither the capability standards of the provider nor the requirement goals of the customer. Scenarios 3 and 4 meet the requirements of one or the other (provider or customer), but not both. Scenarios 5 and 6 meet the goals/requirements of both sides—this occurs when LRT is inside both the customer’s requirement goal and the provider’s capability standard.

Area 3. TDD does not currently cover all classes of supply. Class IX typically accounts for about 72 percent of SDDB requisitions and Class II about 8 percent. An SDDB category of “Other” usually accounts for another 15 percent of requisitions. The remaining 5 percent is divided among the other classes of supply with the exception of Class I. TDD does not evaluate any Class I requisitions. Other

classes of supply could and should be included in TDD measurement, using the SDDB.

Area 4. As described in the TDD Data section, the SDDB is constructed through a number of data pulls at DLA DORRA based on logic and business rules originally designed by the RAND Corporation almost 15 years ago. The combined data are then sent by DORRA to USTRANSCOM monthly, where it is augmented with additional data by TCJ4-LM. There is concern that this process does not formally and automatically occur within some kind of DoD system. Rather, it occurs on local computers per a process that, while documented, may not easily survive future personnel turnover actions. Such a process engenders risk to the processing of data used to calculate TDD—arguably DoD’s most important distribution metric. DoD should take steps to mitigate this risk by recreating the SDDB (in its final form) inside a robust, program-sponsored DoD system.

RESPONSIVENESS: CWT_{OM} DESCRIPTION

CWT_{OM} measures the responsiveness of the DoD supply chain *to orders placed by weapon system maintainers*. CWT_{OM} is a “customer-facing” metric that measures the total elapsed time between the submission of an order by organizational maintenance and the receipt of that same order by organizational maintenance. CWT_{OM} indicates how responsive the DoD supply chain is from an end-user perspective by linking its performance to the operational availability of weapon systems. As shown in Figure D-8, CWT_{OM} includes both back order time and local (retail) supply chain time and therefore actually measures *supply chain* performance. This performance includes the materiel distribution function but does not measure materiel distribution exclusively. Despite covering additional parts of the supply chain, CWT_{OM} is still seen as a valid distribution process metric because it is the key measure of responsiveness from the customer’s point-of-view.

CWT_{OM} is computed as an average for a month, excluding the 1 percent of observations that represent the longest wait times. Those times are normally attributable to data errors or extraordinary circumstances and therefore are not representative of normal supply chain responsiveness. CWT_{OM} is reported by Service (year-to-date performance against established goals), as well as separately for DLA and the Services (monthly performance for all sources of supply for DLA- and Service-managed items). The Metric DNA Table for CWT_{OM} is shown in Figure D-14.

Figure D-14. CWT_{OM} Metric DNA

 Customer Wait Time: Organizational Maintenance (CWT_{OM}) DNA		STATUS OF SCMG ACTIONS			
		COMPLETED	PENDING COMPLETION	PROBLEM	
DEFINITION	Outcome Metric: A measurement of the total elapsed time between submission of a customer order from organizational maintenance and receipt of that order by organizational maintenance.	DEFINITION IN POLICY	Definition is in both draft DODM 4140.01-V10 and Supply Chain Metrics Guide		
SUPPLY CHAIN ATTRIBUTE	Responsiveness (Internal): Timely receipt of replacement parts by organizational maintenance is key to reducing the time to replace failed parts that are causing a not-mission-capable condition for weapon systems.	COMPUTATION	Monthly measurements excludes the 1% of the military service observations that represent longest fulfillment times, which may be attributable to data errors and/or extraordinary circumstances. All times are computed as averages		
BUSINESS VALUE	Customer wait time for organizational maintenance (CWT _{OM}): <ul style="list-style-type: none"> indicates the supply chain responsiveness from an end user's perspective links supply chain performance to weapon systems' operational availability as mean logistics delay time (MLDT) factor 	DATA SOURCE	Military Services provide CWT _{OM} records to DASD(SCI) .		
		OSD DATA REQUIREMENT	Frequency: Monthly Content: CWT _{OM} records contain the initiation and closing dates for order from organizational maintenance and other details of orders (e.g., NSN ordered, urgency of need, etc.).		
		GOALS AND TREND ANALYSIS	Goals: FY2015 performance goals are: <ul style="list-style-type: none"> Army, Navy, and Marine Corps: 15 days Air Force: 7.5 days 		
		DISPLAY	<ul style="list-style-type: none"> Year-to-date performance by Military Service customer Military Service displays of year-to-date performance against goals Monthly performance for all sources of supply, for Service-managed items and DLA-managed items Various other miscellaneous displays for analysis 		

RESPONSIVENESS: CWT_{OM} STANDARDS

CWT_{OM} standards currently exist for all Services, with the standard for the Army, Navy, and Marine Corps set at 15 days, while the Air Force standard is 7.5 days. The MPWG believes these standards are appropriate.

RESPONSIVENESS: CWT_{OM} DATA

Individual Services provide CWT_{OM} data to DASD SCI for overall reporting. Therefore, each Service determines and controls its own data sources used to calculate CWT_{OM}. The MPWG did not uncover any issues with this arrangement, therefore it is recommended that the current Service data sources remain in use.

RESPONSIVENESS: CWT_{OM} MAINTENANCE AND ACTION

CWT_{OM} is currently reviewed during the monthly SCMG meetings, and this forum has proven to be an effective means of evaluating CWT_{OM} and discussing any issues requiring action by the Services or distribution capability providers.

RESPONSIVENESS: CWT_{OM} SUGGESTIONS FOR IMPROVEMENT

Currently, CWT_{OM} only covers requisitions for organizational maintenance for Class IX items. It should be expanded into a more inclusive version measuring additional classes of supply.

Reliability: WPOF(-)

The PMF_{SD} states “the warfighter defines reliability as consistent delivery of the product to the right place, in the right condition, and to an agreed upon delivery date.”⁵ The requirements embedded in this definition align with the DoD-approved Supply Chain Operations Reference (SCOR) model, which defines reliability as *the ability to perform tasks as expected*. SCOR further states that reliability focuses on *the predictability of the outcome of a process* and that typical reliability metric attributes include on-time, right quantity, and right quality. The metric designed to address these attributes is Wholesale Perfect Order Fulfillment (WPOF).

WPOF measures the percentage of orders delivered on time, with the right item and correct quantity, in the right condition, and having proper documentation. Since timeliness is already adequately addressed in both wholesale and retail channels by the TDD and CWT_{OM} metrics, the MPWG recommended an adjustment to the metric to remove the “on-time” element, or WPOF(-).

RELIABILITY: WPOF(-) DESCRIPTION

WPOF(-) evaluates the performance of wholesale supply in satisfying customer demand for the *right quantity, sufficient quality, and proper documentation*. WPOF(-) thus provides enterprise value by indicating how well the wholesale supply > order management > distribution system chain is performing *together*, to provide the right materiel, in the right quantities, and with the right documentation.

RELIABILITY: WPOF(-) STANDARDS

The following rules for WPOF(-), adapted from the guide, are recommended:

- An order is perfect if it is delivered with the right quantity, in sufficient quality, and with proper documentation. A failure of any one of these four conditions is a failure for that order.
- The Logistics Metrics Analysis Reporting System Materiel Receipt Acknowledgement (LMARS MRA) discrepancy code on an order serves as the basis for the following conditions.⁶
 - Right quantity

⁵ See Note 3.

⁶ LMARS maintains logistics pipeline information for all wholesale items. Populated with information from MILSTRIP and MILSTRAP transactions, LMARS has the capability to track materiel and report associated response times for various nodes along the logistics pipeline. LMARS MRA codes are not always complete or accurate, and DoD is developing systems to improve reporting, which should lead to improved designation of a perfect order.

-
- A delivery has the correct quantity if its MRA discrepancy code is something other than “F.”
 - “F” indicates a partial or total non-receipt.
 - Sufficient quality
 - A delivery has sufficient quality if its MRA discrepancy code is anything other than “A,” “D,” “E,” or “X.”
 - “A” indicates a supply discrepancy report is being submitted (excludes shortage and partial or total non-receipt).
 - “D” indicates a transportation discrepancy report being submitted (excludes shortage and partial or total non-receipt).
 - “E” indicates a product quality deficiency report is being submitted.
 - “X” indicates a discrepant receipt, other than shortage and partial or total non-receipt, which does not meet the qualifying criteria for a discrepancy report submission.
 - Proper documentation
 - A delivery has the proper documentation if its MRA discrepancy code is anything other than “B.”
 - “B” indicates there is no record of requisition.

RELIABILITY: WPOF(-) DATA

Data for populating WPOF(-) is currently provided monthly from DLA Transaction Services. It includes individual LMARS records for each requisition placed against wholesale sources of supply, including any MRA discrepancy codes.

RELIABILITY: WPOF(-) MAINTENANCE AND ACTION

WPOF is currently reviewed in the SCMG, which has proven to be an effective forum for evaluating WPOF performance and discussing issues that require action by the Services or distribution capability providers. It is recommended that the SCMG also maintain and provide action on WPOF(-).

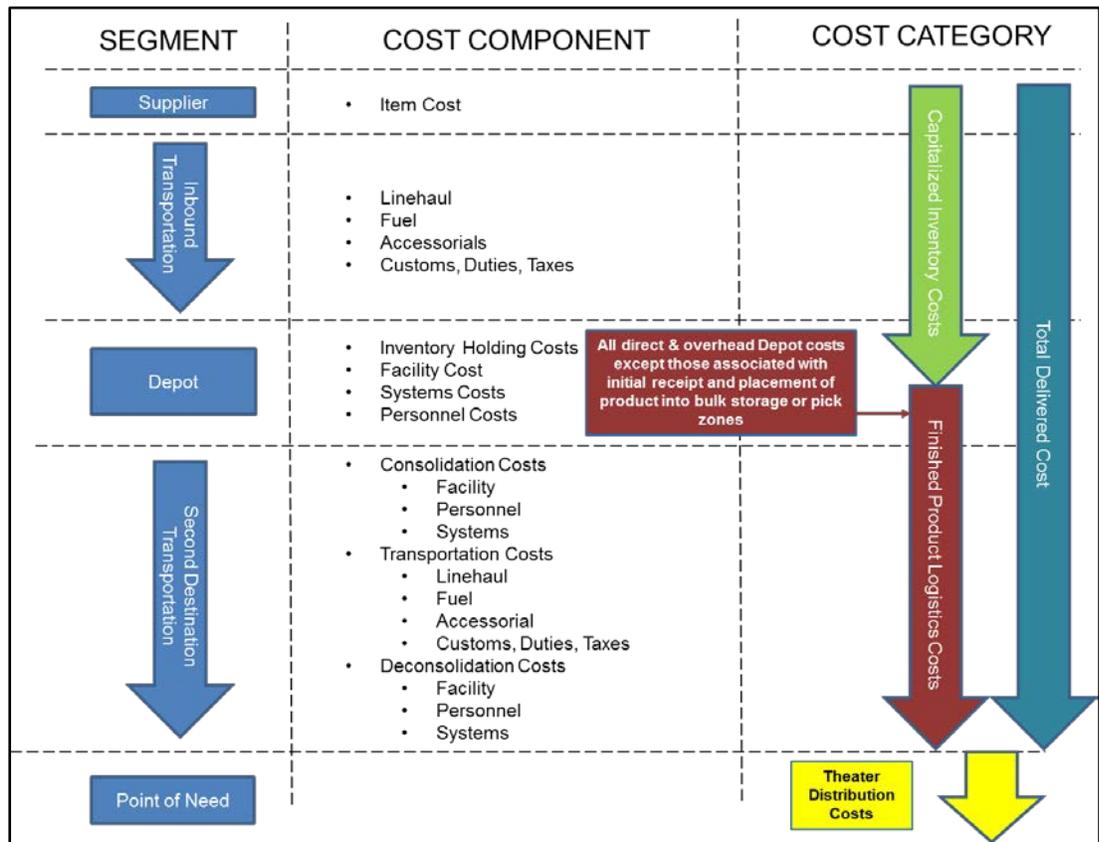
RELIABILITY: WPOF(-) SUGGESTIONS FOR IMPROVEMENT

Outside of improving the completeness and accuracy of LMARS code data, the MPWG had no suggestions for improving WPOF or its derivative, WPOF(-).

Cost/Efficiency: FPLC

Achieving a comprehensive enterprise measurement of materiel distribution costs is a difficult undertaking. Long and complex supply chains require measures that track individual component costs against their own historical standards as well as highlight each component's performance relative to costs for other components in the chain and across entire segments in the chain. Figure D-15 highlights the complicated interrelationship of various costs across the supply chain.

Figure D-15. Supply Chain Costs.



There are existing metrics in the guide that do measure the costs associated with parts of the overall distribution function. For example, transportation cost (costs incurred to transport materiel from a DoD source such as a depot to a customer at the point of acceptance) measures a significant portion of the second destination transportation segment. However, the guide contains no comprehensive cost measurement that includes the entire materiel distribution pipeline.

COST/EFFICIENCY: FPLC DESCRIPTION

FPLC can be defined as all costs incurred after the entry and initial placement of finished products into the warehousing and distribution chain, until delivery of these items to the point of acceptance—the point where the responsibility of the

supply system ends in the theater. FPLC is represented by the maroon arrow at the lower right side of Figure D-19. It comprises all costs involved in actually delivering a product to the customer when it is sold. FPLC is distinct from those costs involved in acquiring (making or buying) a product to be sold. These costs, considered in commercial terms, are considered to be *capitalized inventory costs*, represented by the green arrow in the figure. The “dividing line” between these two cost categories is at the depot (or manufacturer /supplier’s warehouse in the case of direct vendor delivery). Everything up to and including the entry and initial placement of finished products into the warehousing and distribution chain is a part of capitalized inventory cost, and everything after that point is FPLC. When combined, these costs equal total delivered cost (TDC), represented by the blue arrow.

FPLC includes all logistics activity necessary to ensure delivery of ordered materiel to the point of acceptance, such as

- inventory storage, warehousing and other handling costs including lateral redistribution costs;
- transportation costs;
- consolidation and deconsolidation costs; and
- customs fees, tariffs and duties, currency changes, and port charges.

FPLC should also include the costs of any supporting systems, such as warehouse management systems, inventory management systems, and transportation management systems that are ascribable to these logistics activities. As shown in Figure D-19, these costs begin to accrue once the finished products “become” distributable inventory held at either a DLA depot facility or at the manufacturer/vendor’s warehouse in the case of direct delivery items. Operators and analysts can use FPLC to better understand overall distribution costs and to make informed decisions based on each cost incurred when moving materiel through the pipeline.

COST/EFFICIENCY: FPLC STANDARDS

Because FPLC has not been established, there are no existing DoD performance standards. As FPLC will be designed to focus on DoD’s unique distribution system and the relationships across all cost components in that distribution chain, there are no industry standards that can be universally applied. A standard should only be developed after system-wide baselines of performance have been established using historical data. Once baselines are established, FPLC can be used to do the following:

- Alert distribution stakeholders to changes in distribution system costs across one or more components, which may indicate a distribution process

issue. Established baselines and trend analysis can identify when any of the various cost components is out of historical balance with itself or compared with others. Data analysts can drill down to identify the root cause of any trend shifts or cost spikes and whether corrective action should be considered.

- Assess the likely cost impacts of changes in policy, technology, or operational tempo. For example, the introduction of a sophisticated enterprise warehouse management system could result in faster inventory turns thereby reducing holding costs. FPLC will provide a data-supported framework to evaluate the likely cost effects of changes to any of these three.

While a firm standard or goal may not be established initially, FPLC will allow the JDDE COI to gain insights into the tradeoffs and sensitivities between the various cost components that make up the distribution chain and will add important cost-based information to the decision-making process.

COST/EFFICIENCY: FPLC DATA ELEMENTS AND SOURCES

Many of the elements of FPLC are available in the current set of metrics compiled by DASD SCI, while others, such as transportation costs, are currently under development. FPLC should be developed incrementally from the bottom up using detailed transactional data wherever possible and based on an agreed-upon and documented design framework. Individual cost component measures should be developed and validated independently, prior to combining them to report the entire FPLC measure. Creating an initial metric development plan would enable DoD to identify the data needed, the organizations responsible for producing it, the linkages needed to tie the data together to create the metric and a logical path for managing the whole effort.

FPLC would require a majority of its component inputs from two principal stakeholders—DLA and USTRANSCOM. Many inputs can be pulled from existing data sources. However, there are likely other sources of information that must be identified or developed, some of which will require additional resources or processes to capture and validate relevant information that is not currently gathered. Information needed for the FPLC metric falls into the following broad categories:⁷

- ◆ *Inventory holding costs.* When items are held in a warehouse for extended periods as part of the distribution strategy, or have long transits onboard sea lift carriers, they accrue holding costs that increase the amount of outstanding obligations that have to be covered by working capital on hand. It

⁷ Ted Schaefer and Alan Kosansky, “A fresh approach to improving total delivered cost,” *Supply Chain Quarterly*, Quarter 1 2014, www.supplychainquarterly.com/topics/Strategy/20140311-a-fresh-approach-to-improving-total-delivered-cost/.

is assumed that DLA calculates these inventory holding costs and could provide these data, probably down to the individual item number.

- ◆ *Packaging, warehousing, and distribution costs.* These are charges incurred to prepare purchased materiel for transport. They are derived from all activities occurring within DLA distribution facilities that are not related to the initial receipt and placement within the warehouse of finished goods from a manufacturer (i.e., items received via Inbound or First Destination transportation). Many of these activities are fixed costs and should be allocated to each item, or category of items, based on the application of an appropriate variable. For example, if it takes longer to palletize and shrink-wrap a particular item for outbound shipment, then that item should have a larger share of warehouse fixed overhead applied to it, probably based on the percentage of total labor hours required for processing. Data would likely come from the following sources:
 - Facility, systems, and personnel costs would come from depot (DLA) O&M systems.
 - The apportionment of costs (for overhead) should be by item (NSN, NIIN, NCN, MCN, LSN, LIN, etc.) or order (i.e., TCN) and that shipment information would come from the depot (DLA) shipper system.
- ◆ *Second destination transportation costs.* Include the total cost to transport goods from the point of sourcing to the point of acceptance, including inland drayage, port-to-port movements, port holding costs and any inland delivery from port to point of acceptance. It is critical that the full cost of transport is captured including fuel, demurrage and incidental charges.
 - Consolidation and deconsolidation should be considered part of transportation. Data should be available from consolidation locations, such as the DLA Container Consolidation Point at Defense Distribution Depot Susquehanna, Pennsylvania (DDSP), where multiple single TCNs are grouped and shipped together under a consolidated TCN. This may be a point of weakness in FPLC calculation as, in the past, individual TCNs were not always mapped to the consolidated TCN, and the consolidated TCN not always recorded in the system. This is important because the consolidated TCN provides the transactional linkage to a given IDL (and eventually to a given distribution stream) permitting the determination of the cost of servicing a given IDL/stream to a given standard.
 - Transportation cost data are currently gathered from USTRANSCOM's IGC system, which houses U.S. Bank invoice history from commercial transportation providers as well as the Cargo and Billing System (CABS) invoice history for Integrated Booking System (IBS) booked ocean vessels.

- Customs, duties and taxes represent the cost to import to or move goods across foreign nations. This information may be available through IBS or the Global Air Transportation Execution System (GATES) for DoD imported goods, or may be captured separately on the vendor invoice for vendor-imported items.

COST/EFFICIENCY: FPLC MAINTENANCE AND ACTION

Since FPLC incorporates a range of activities at different locations and several cost components, each of which could be collected in different systems, calculation of the metric will require the cooperation and inputs of many stakeholders.

Since both DLA and USTRANSCOM have responsibility for the supply chain segments (and associated costs) that will make up FPLC, the existing DLA-USTRANSCOM partnership should be leveraged to compile and manage the cost elements needed to populate the metric and coordinate the actions of the various stakeholders. Since DASD SCI currently manages the guide's existing metrics, it is appropriate that it would also incorporate FPLC into the existing metrics workflow and governance structure.

COST/EFFICIENCY: RECOMMENDATIONS FOR IMPROVEMENT

For FPLC to become a viable metric, the information in each of the data sources listed above needs to be both accurate and *linkable* in such a way that a meaningful final metric is produced. This link can only be established through managed processes that ensure all necessary information is populated at the transactional level. For example, a process should be developed to ensure that the shipment level TCN is consistently populated in the SDDB data set and any subordinate TCN's are mapped to it.

Also, FPLC will be most effective when it identifies the cost of each item or class of item entering the distribution pipeline, as this will produce unique insights about the effects of each on the overall distribution chain. Therefore, information about item nomenclature and class will need to be linked to cost at the transactional level as well.

As indicated in Figure D-19, eventually FPLC should become just one major element in the calculation of TDC. TDC will measure the cost of the entire DoD supply chain, including capitalized inventory costs, the logistics costs associated with managing inventory for distribution, and the actual transportation of that inventory into the customer's hands.

Appendix E

Data Quality Development

THE DATA QUALITY INFRASTRUCTURE

The role of a DoD data quality infrastructure is two-fold. First, it allows data users to assess whether the data they need are sufficiently free of significant error. To accomplish this, the infrastructure must require data generators to provide a full description of the data (including known errors), the collection methods used, and any assumptions made about the data or the collection procedures. Second, the infrastructure permits data users to determine whether data have been subject to verification and validation procedures (measured against accepted definitions and established standards) such that the data are considered credible and reliable. Establishing this infrastructure allows DoD to minimize the use of data with known problems that would lead to inaccurate or incomplete performance assessments.

DATA QUALITY DEFINED—THE DIMENSIONS AND ATTRIBUTES OF QUALITY

The goal of the infrastructure is to achieve high-quality data. But what exactly constitutes “quality”? Research has identified nine different dimensions of data quality taken from Government Accountability Office reports, other government sources, and academic literature:

- Relevance
- Accuracy
- Comparability
- Interpretability
- Timeliness
- Accessibility
- Integrity
- Coherence
- Objectivity.

Reducing or consolidating these nine down to a more manageable number of dimensions not only facilitates data quality measurement but also provides a sharper focus for improvement efforts. From the list of nine, four dimensions have

emerged as being the most meaningful for DoD purposes: Relevance, Accuracy, Comparability, and Interpretability.

Relevance

Data are relevant if they meet the needs of the user community. This starts with a clear, operationally-focused definition for each data element. For example, the Consolidation and Containerization Point (CCP) Ship data element currently lacks specificity, because CCP Ship definitions range from when an item is released to a carrier for movement, to when the item is physically shipped out of the CCP. These definitional differences can equate to several days, making the data much less relevant, when viewed as a set of data across the entire enterprise or major parts of it. Establishing relevance ensures a common understanding of what, where, and how data are collected during a process.

The attributes of relevance are:

- *Timeliness*—data are refreshed and available such that they meet user temporal requirements. If data are uploaded monthly but a user needs weekly reporting, then timeliness is deficient.
- *Accessibility*—data are available to the user community either through a system of record or another system. Data are less relevant if they are inaccessible to the user.
- *Format*—data are formatted consistently and correctly for the user’s purposes.
- *Content*—data are understood by the user and captured and reported consistently. Terms in a data field should not be duplicative—for example, “truck” and “9” may mean the same thing, but they should not be used in the same field.

Accuracy

Data are accurate if they describe an event correctly from the perspective of the user. The content of the data field should reflect the “real” event with the precision required by the user.

The attributes of accuracy are:

- *Correctness*—data are correct from an operational perspective. For example, if a container departs the CCP, the date-time stamp is accurate if the container actually physically left the facility on the date and time recorded. If the container departure was manually recorded 3 days after the actual departure, or is entered to represent the time the container is scheduled to be lifted, the entry would not be correct.

- *Precise*—data are precise if it meets the level of fidelity and granularity required by the user. If a container departure was recorded in the system via batch entry, and the date-time was recorded as midnight on the day of departure (versus the actual departure time of 1,300 hours), the entry is considered precise if the user needs to know only the day of departure, but imprecise if the actual hour of departure is required.
- *Complete*—data are incomplete if the event occurred but the system contains no data for it. Blank entries are accurate only if the event did not occur.

Comparability

Data are comparable if they are similar enough, as defined by the user community, that a statistically and logically valid comparison of data collected across time, geography, or operational entities is possible. The comparability of different data sets determines the degree to which they can be used collectively to support decision making. Unless data represent the same process and collection point during that process, and were obtained in similar operational environments, one should not expect the data to be directly comparable.

The attributes of comparability are:

- *Coherence*—two or more data elements are linked by an informed logic applied in a consistent manner.
- *Compatible methods*—data are collected using the same methods. Collecting data through different methods inhibits comparability. This attribute focuses on the differences between two or more collection procedures or processes.
- *Metadata*—metadata (data about data) are available that inform and enhance comparability. If metadata does not exist or is poorly communicated, comparability suffers.
- *Internal controls*—quality assurance and quality control activities that are integrated into the operational and/or the data collection processes improve comparability. If these activities are not present or not well documented, comparability is diminished.

Interpretability

Data can be properly interpreted if the user community has access to information that explains or implies what the data represent and any limitations to the data that might impact their use. Such information may reside in supplements such as system documentation, data dictionaries, or metadata. Information may cover the methodology for data collection and processing (for example, what filters are

applied) and may openly note accuracy limitations. Much of this information can and should be recorded in a data map, representing events from the physical event that triggers the data through the systems that process and transmit it, until the data element being evaluated is actually populated in a source of record (SOR).¹

Objectivity is likewise a component of interpretability. If a user can verify that the data were captured and recorded using objective means and processes (versus subjective or skewed methods), this will support conclusions that the data are accurate, reliable, and unbiased.

Information supporting a determination of interpretability should document issues that data users need to be aware of and include any findings for follow-on action. Such information includes but is not limited to

- standardized business rules for the physical capture of data that are implemented at all locations capturing a specific data element, and
- data maps detailing the physical capture and recording of data to the SOR.

¹ A source of record (SOR) is an information storage and retrieval system that is the authoritative source for a particular data element originating in, or found across, multiple locations and in multiple (non-SOR) sources. To ensure data integrity, there must be one – and only one – SOR for a given piece of information. SORs share the following characteristics: they provides the most complete, most accurate and most timely data, they have the best structural conformance to the data model, they are nearest to the point of operational entry and they can be used to feed other systems.

Appendix F

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Appendix G

Acronyms

AIS	Automated Information System
AIT	Automatic Identification Technology
AMC	Air Mobility Command
AMS Tac	Automated Manifest System Tactical
AOR	Area of Responsibility
ASD (L&MR)	Assistant Secretary of Defense for Logistics and Materiel Readiness
AV	Asset Visibility
BCA	Business Case Analysis
CABS	Cargo and Billing System
CCDR	Combatant Commander
CCMD	Combatant Command
CCP	Consolidation and Containerization Point
CIMIP	Comprehensive Inventory Management Improvement Plan
CINC	Commander in Chief
COCOMs	Combatant Commands
COI	Community of Interest
CONUS	Continental United States
CP-GD	Campaign Plan for Global Distribution
CPI	Continuous Process Improvement
CRAF	Civil Reserve Air Fleet
CWT	Customer Wait Time
CWT _{OM}	Customer Wait Time Organizational Maintenance
DAFL	Directive Authority for Logistics
DAWG	Data Accuracy Sub-Working Group
DCMO	Deputy Chief Management Officer
DCOI	Distribution Community of Interest
DCS	Defense Collaboration Services

DDJC	Defense Distribution Center San Joaquin
DDNV	Defense Distribution Center Norfolk
DDSP	Defense Distribution Center Susquehanna
DEB	Distribution Process Owner Executive Board
DLA TS	Defense Logistics Agency Transaction Services
DLA	Defense Logistics Agency
DLA-T	Defense Logistics Agency–USTRANSCOM Division
DOC	Distribution Oversight Council
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DoDR	Department of Defense Regulation
DORRA	DLA Office of Operations Research and Resource Analysis
DPO	Distribution Process Owner
DPR	Distribution Performance Review
DQC	Data Quality Compliance
DSG	Distribution Steering Group
DSO	DPO Strategic Opportunities
DST	DLA Support Team
DTS	Defense Transportation System
DVD	Direct Vendor Delivery
DWG	Distribution Working Group
EBS	Enterprise Business System
EDI	Electronic Data Interchange
FLIS	Federal Logistics Information System
FPLC	Finished Product Logistics Cost
GAAP	Generally Accepted Accounting Practices
GAO	United States Government Accountability Office
GATES	Global Air Transportation Execution System
GCC	Geographic Combatant Commander
GDN	Global Distribution Network
GDS	Global Distribution Synchronizer

GPRA	Government Performance and Results Act
GSA	General Services Administration
GTN	Global Transportation Network
HA/DR	Humanitarian Assistance/Disaster Relief
IBS	Integrated Booking System
IC	Information Confidence
IDE	Integrated Data Environment
IDL	Integrated Distribution Lane
IGC	Integrated Data Environment/Global Transportation Network Convergence
IM	Inventory Management
IP	Implementation Plan
IRPs	Issue Resolution Plans
ISIL	Islamic State of Iraq and the Levant
IT	Information Technology
ITV	In-Transit Visibility
JCA	Joint Capability Area
JCS	Joint Chiefs of Staff
JDA	Joint Deployment Agency
JDDE	Joint Deployment and Distribution Enterprise
JDDOC	Joint Deployment and Distribution Operations Center
JDPO	Joint Deployment Process Owner
JDS	Joint Deployment System
JECC	Joint Enabling Capabilities Command
JFC	Joint Forces Command
JIC	Joint Integrating Concept
JLEnt	Joint Logistics Enterprise
JLLIS	Joint Lessons Learned Info System
JLOC	Joint Logistics Operations Center
JP	Joint Publication or Joint Pub
JTF-PO	Joint Task Force–Port Opening
JTRU	Joint Transportation Reserve Unit
LCN	Local Control Number

LIIN	Line Item Identification Number
LMARS	Logistics Metrics Analysis Reporting System
LOE	Line of Effort
LRT	Logistics Response Time
MCN	Management Control Number
MDIP	Materiel Distribution Improvement Plan
MILALOC	Military Air Line of Communications
MILSTRAP	Military Standard Transaction Reporting and Accounting Procedures
MILSTRIP	Military Standard Requisitioning and Issue Procedures
MNO	Multinational Organization
MPWG	Metrics and Performance Sub-Working Group
MRA	Materiel Receipt Acknowledgement
MRAP	Mine-Resistant Ambush Protected
MSC	Military Sealift Command
NAVSUP	Navy Supply Systems Command
NGO	Non-governmental Organization
NIIN	National Item Identification Number
NMCS	Not Mission Capable Supply
NSN	National Stock Number
ODASD/SCI	Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration
OMB	Office of Management and Budget
OPCON	Operational Control
OPLANS	Operations Plans
OPR	Office of Primary Responsibility
OPTEMPO	Operations Tempo
ORT	Order Response Time
OSD	Office of the Secretary of Defense
PCFN	Port Call File Numbers
PGWG	Policy and Governance Sub-Working Group
PMF _{SD}	Performance Metrics Framework for Sustainment Distribution

POD	Port of Debarkation
POE	Port of Embarkation
POS	Point of Supply
pRFID	Passive Radio Frequency Identification
RAS	Risk Assessment Scale
RDI	Rapid Deployment Initiative
RFF	Request for Forces
RFID	Radio Frequency Identification
SCESC	Supply Chain Executive Steering Committee
SCMG	Supply Chain Metrics Group
SCOR	Supply Chain Operations Reference
SCR	Special Requirements Code
SDDB	Strategic Distribution Database
SDDC	Surface Deployment and Distribution Command
SECDEF	Secretary of Defense
SES	Senior Executive Service
SLA	Service Level Agreement
SNO	Strategic Network Optimization
TAV	Total Asset Visibility
TCN	Transportation Control Number
TCP	Theater Campaign Plan
TCSP	Theater Consolidating and Shipping Point
TDC	Total Delivered Cost
TDD	Time Definite Delivery
TDP	Theater Distribution Plan
TDS	Total Delivery Services
T-JTB	Theater Joint Transportation Board
TLO	Theater Logistics Overview
TS	Transaction Services
UCP	Unified Command Plan
USACOM	United States of America Command
USD (AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics

USFF	United States Fleet Forces Command
USJFCOM	United States Joint Forces Command
USMC	United States Marine Corps
USTRANSCOM	United States Transportation Command
UTC	Unified Transportation Command
WPOF	Wholesale Perfect Order Fulfillment