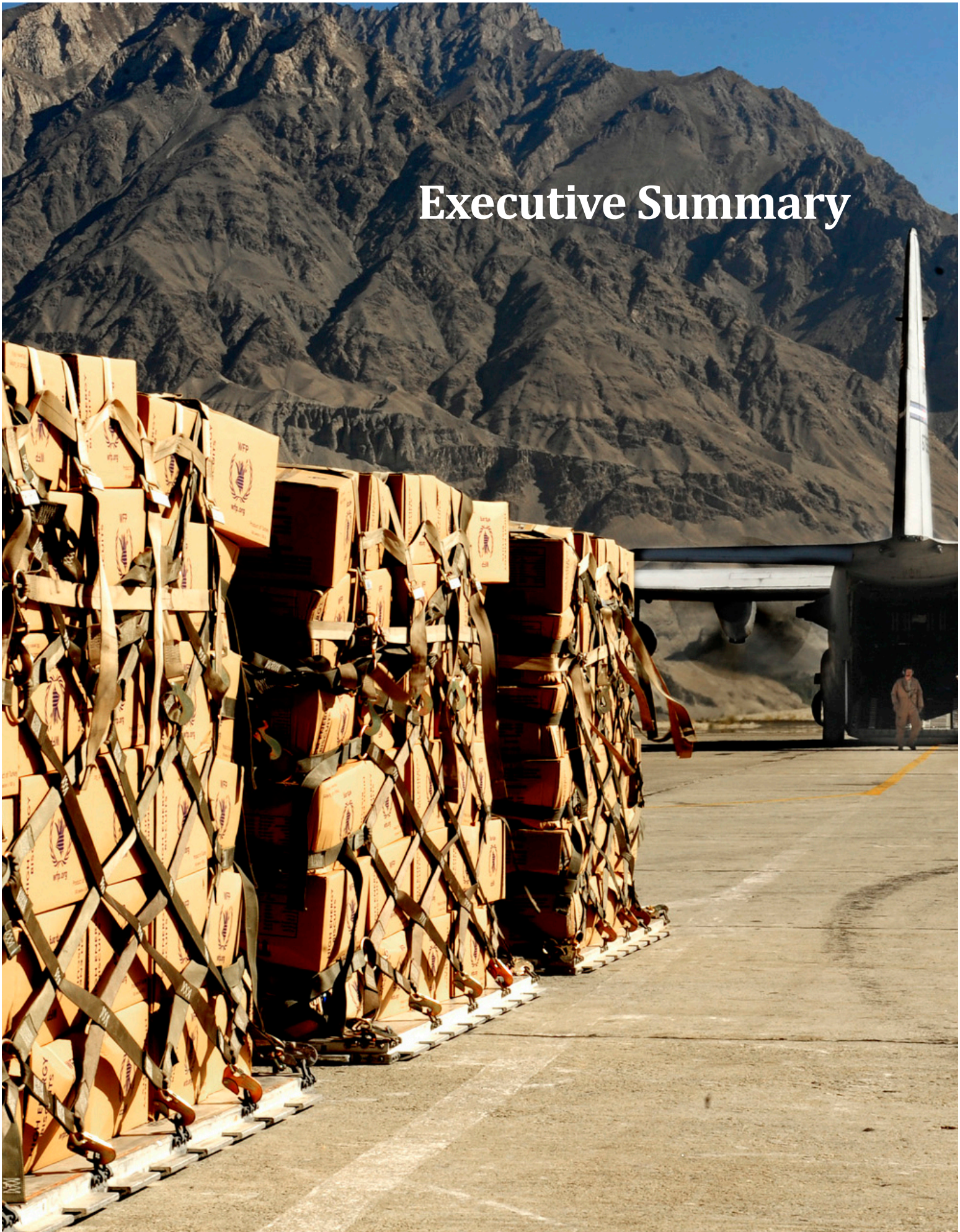
Supply Chain Metrics Guide

2nd Edition
February 7, 2020

Executive Summary



Executive Summary

The performance of the DoD supply chain is essential to warfighter readiness. To monitor that performance, the Office of the Deputy Assistant Secretary of Defense for Logistics (ODASD[Logistics]), in coordination with the military departments, the Defense Logistics Agency (DLA), United States Transportation Command (USTRANSCOM), Joint Staff and Government Service Administration (GSA) maintains a comprehensive suite of supply chain metrics for Department-wide use. The metrics in the suite are selected to (1) assess the effectiveness and efficiency of the DoD supply chain enterprise and (2) measure the success of major initiatives to improve readiness along with inventory and distribution management within the enterprise. The metrics evaluate the degree to which the DoD supply chain exhibits the attributes of responsiveness to customer requests, reliability of the internal processes, and consideration of supply chain costs and customers' supply chain expenditures, while ensuring necessary and appropriate planning and precision in support of materiel readiness.

The suite of metrics creates a framework whereby the Department works collaboratively with supply chain stakeholders to:

- track supply chain performance against established goals and targeted trends;
- identify negative performance trends or anomalies and begin development of corrective actions;
- evaluate performance results from efforts designed to improve DoD supply chain processes; and
- establish policy changes to improve supply chain performance.

This Guide presents a comprehensive description of each metric, including its definition, business value, goals, and targeted performance trends. Detailed explanations of the computations for each metric and key relationships to other metrics are included. The Guide also provides direction on the reporting of each metric and on the way the metric should be displayed and used. In addition, the Guide includes separate sections to cover the following:

- The selection criteria for metrics to evaluate the success of major improvement initiatives.
- The relationship of enterprise metrics to major supply chain attributes and how they measure the degree to which the supply chain is exhibiting those attributes.
- The use of supply chain metrics to monitor and assess performance against the business objectives of
    - sustaining weapon system support to the nation's military forces,
    - improving overall inventory management,
    - improving asset visibility and accessibility,
    - providing an integrated enterprise view
    - monitoring and controlling supply chain costs, and
    - promoting awareness of strategic supply chain goals.

In summary, this Guide serves as a reference for the comprehensive, standardized set of DoD-wide supply chain metrics and their recommended use to monitor DoD supply chain performance.

Contents

Executive Summary ..... **iii**

An Introduction to the DoD Supply Chain Metrics Guide **1**

Guide Content 1
Major Sections 1
Metric Descriptions and Instructions 1
Appendices 2

Purpose of the Guide 2

Development–Selection Criteria 2
Metrics Associated with Assessing Supply Chain Performance 2
Metrics Associated with Supply Chain Improvement Initiatives 4

Metrics and Supply Chain Attributes 5
Attributes and Strategic Business Goals 5
Metrics by Attribute 6

Guide Updates 7

Using Metrics **9**

Using Metrics to Monitor Weapon System Support to Warfighters 9

Using Metrics to Track Inventory Management Improvements 11

Using Metrics to Track the Impact of Improved Asset Visibility and Accessibility and its impact on Distribution Effectiveness 16
Using Metrics to Explore and Explain a Performance Problem: An Example 18

Enterprise Level Metrics **21**

Materiel Readiness Metrics 22
Description 22
The Not Mission Capable (NMC) Rate Metric 22
Not Mission Capable Supply (NMCS) Backorders 26

Responsiveness Metrics 29
Description 29
Customer Wait Time for Organizational Maintenance (CWT_{OM}) 29
Logistics Response Time (LRT) 33

Reliability Metrics 36
Description 36
Time Definite Delivery (TDD) Compliance 36
Wholesale Perfect Order Fulfillment 39
Wholesale Supply Availability 41
Materiel Denial Rates 46

Cost Metrics 49
Description 49
Logistics Cost Baseline 49
Value of Secondary Item Inventory 51
Inventory Segmentation of No Demand Items 55
Tiered Inventory Turns 56
Supply Management Costs 58
Supply Management Cost Changes 62

Planning and Precision Metrics 66
Description 66
Excess On-Hand 66
Due-In Potential Future Excess 69
Demand Forecast Accuracy and Bias 73
Unserviceable DLR Return Times 81
Unserviceable DLR Over-Aged Due-Ins 83
Procurement Lead Time 87
Procurement Lead Time Variance 89
Repair Cycle Time 93

Metrics Associated with Improving Inventory Management 97

Inventory Management Metrics by Desired Outcome 98
Desired Outcome for Total Asset Visibility 98
Desired Outcome for Economic Retention 98
Desired Outcome for Contingency Retention Stock (CRS) 98
Desired Outcome for Storage and Direct Vendor Delivery 98
Desired Outcome for Items with No Demand 99
Desired Outcome for Disposition of Potential Reutilization Stock 99
Desired Outcomes for Other Inventory Improvement Actions 99

Inventory Accessibility 100
Use of the Inventory Accessibility Metric 100
Development of the Inventory Accessibility Metric 101
Description of the Inventory Accessibility Metric 101
Relationships with Other Metrics 102

ERS as a Percentage of Total Inventory 102
Use of the ERS as a Percentage of Total Inventory Metric 102
Development of the ERS as a Percentage of Total Inventory Metric 103
Description of the ERS as a Percentage of Total Inventory Metric 103
Relationships with Other Metrics 104

Economic Benefit of ERS 104
Use of the Economic Benefit of ERS Metric 104
Development of the Economic Benefit of ERS Metric 105
Description of the Economic Benefit of ERS Metric 105
Relationships with Other Metrics 106

CRS as a Percentage of Total Inventory 106
Use of the CRS as A Percentage of Total Inventory Metric 106
Development of the CRS as a Percentage of Total Inventory Metric 107
Description of the CRS as a Percentage of Total Inventory Metric 107
Relationships with Other Metrics 108

CRS Reason Codes 108
Use of the CRS Reason Codes Metric 108
Development of the CRS Reason Codes Metric 109
Description of the CRS Reason Codes Metric 110
Relationships with Other Metrics 110

Secondary Item Storage Costs–Distribution Depot 110
Use of the Secondary Item Storage Costs–Distribution Depot Metric 110
Development of the Secondary Item Storage Costs—Distribution Depot Metric 111

Description of the Secondary Item Storage Costs–Distribution Depot Metric 111
Relationships with Other Metrics 112

Secondary Item Storage Footprint 112
Use of the Secondary Item Storage Footprint Metric 112
Development of the Secondary Item Storage Footprint Metric 113
Description of the Secondary Item Storage Footprint Metric 113
Relationships with Other Metrics 114

Value of Inventory with 0–10+ Years of No Demand 114
Use of the Value of Inventory with 0–10+ Years of No Demand Metric 114
Development of the Value of Inventory with 0–10+ Years of No Demand Metric 115
Description of the Value of Inventory with 0–10+ Years of No Demand Metric 115
Relationships with Other Metrics 116

PRS Disposition 116
Use of the PRS Disposition Metric 116
Development the of PRS Disposition Metric 117
Description the of PRS Disposition Metric 117
Relationships with Other Metrics 118

Disposal Dollars for Reparable and Consumable Items 118
Use of the Disposal Dollars for Reparable and Consumable Items Metric 118
Development of the Disposal Value of Serviceable and Unserviceable Reparable and Consumable Items Metric 119
Description of the Disposal Value of Serviceable and Unserviceable Reparable and Consumable Items Metric 119
Relationships with Other Metrics 120

AAO Stocks as a Percentage of Total Inventory 120
Use of the AAO Stocks as a Percentage of Total Inventory Metric 120
Development of the AAO Stocks as a Percentage of Total Inventory Metric 121
Description of the AAO Stocks as a Percentage of Total Inventory Metric 121
Relationships with Other Metrics 122

AAO Inventory Segmentation 123
Use of the AAO Inventory Segmentation Metric 123
Development of the AAO Inventory Segmentation Metric 124
Description of the AAO Inventory Segmentation Metric 124
Relationships with Other Metrics 125

Metrics Associated with Improving Distribution Effectiveness 127

Lateral Redistribution 127
Use of the Lateral Redistribution Metric 127
Development of the Lateral Redistribution Metric 128
Description of the Lateral Redistribution Metric 128
Relationships with Other Metrics 129

Procurement Offset 129
Use of the Procurement Offset Metric 129
Development of the Procurement Offset Metric 130
Description of the Procurement Offset Metric 130
Relationships with Other Metrics 130

Routing Identifier Code (RIC) Participation 130
Use of the RIC Participation Metric 130

Development of the RIC Participation Metric 131
Description of the RIC Participation Metric 131
Relationships with Other Metrics 132

Appendix A. Criteria 2 and 3 for Selection of Enterprise Metrics 1

Criterion 2. Metrics and Supply Processes 1

Criterion 3. Desired Behaviors and Metrics 3
Supply Chain Objective 3
Desired Behavior 3
Metric – How It Supports Desired Behavior 3

Appendix B. Enterprise Metrics Data Submission Requirements 1

Appendix C. Logistics Tools 1

Appendix D. Enterprise Metrics Data Quality Validations 1

Appendix E. Abbreviations 1

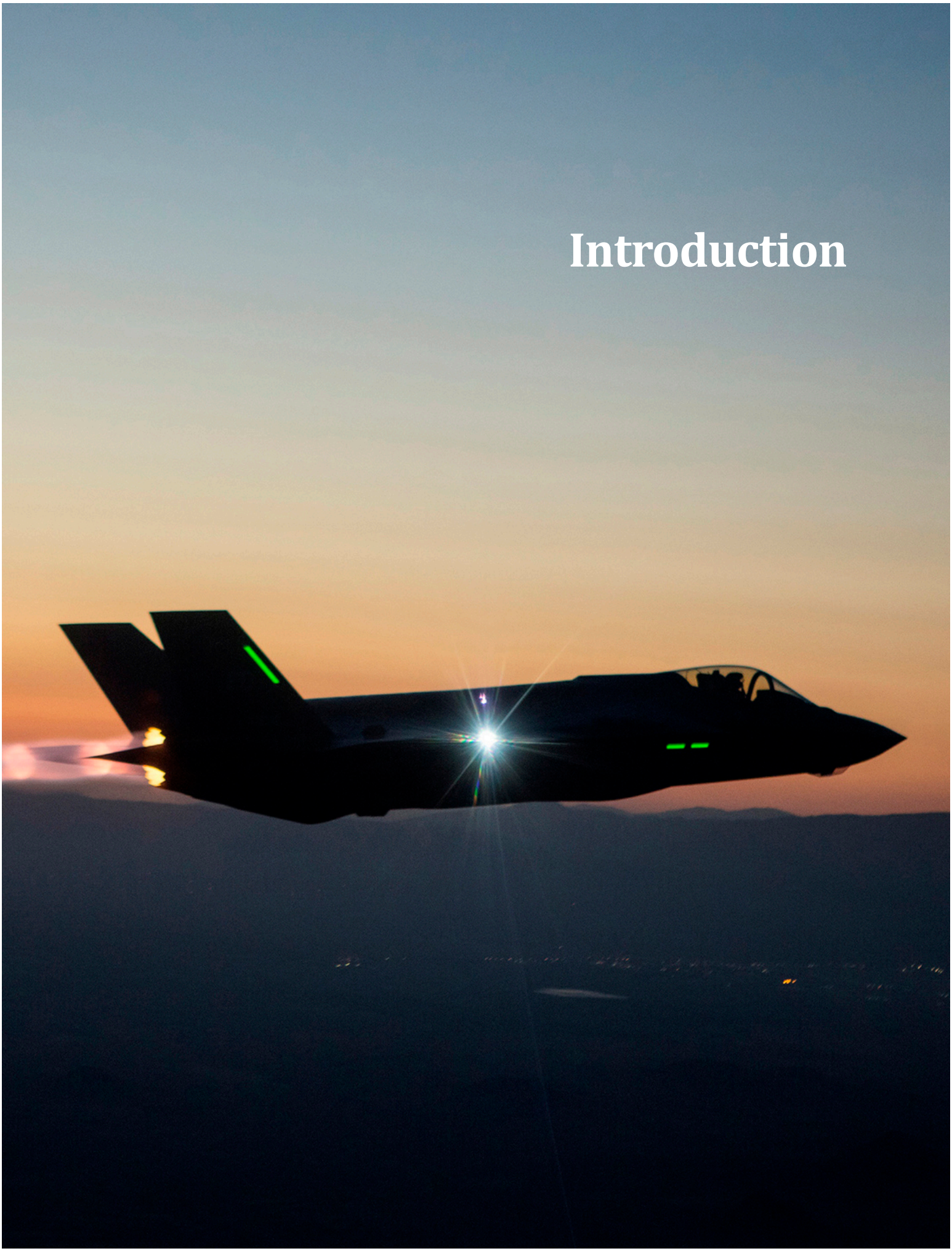
Appendix F. Definitions 4

Figures

Figure 1. Supply Chain Strategic Objectives 3
Figure 2. Integrated Relationships between Supply Chain Enterprise Metrics 4
Figure 3. Strategic Goals and Metrics Analytical Framework 6
Figure 4. DoD Supply Chain Metrics Framework 7
Figure 5. The Role of the Customer Wait Time 9
Figure 6. Not Mission Capable Rates for Major Weapon System Groups 10
Figure 7. Not Mission Capable Supply Backorders 10
Figure 8. Secondary Item Inventory Changes 11
Figure 9. Government Managed Excess On-Hand 12
Figure 10. Due-In Long Supply 13
Figure 11. Forecast Accuracy and Forecast Bias 14
Figure 12. Procurement Lead Time Variances 15
Figure 13. Requirements for Improved Distribution Effectiveness 16
Figure 14. DoD-wide Inventory Accessibility 17
Figure 15. Lateral Redistribution and Procurement Offset Savings 18
Figure 16. Problem Measurements 19
Figure 17. Assessments from NMC Rate Graphs 23
Figure 18. General Display for Not Mission Capable Rates 25
Figure 19. Assessments from NMCS Backorder Graphs 26
Figure 20. General Display for Not Mission Capable Supply Backorders 28
Figure 21. Assessments from CWT_{OM} Graphs 30
Figure 22. General Display for Customer Wait Time for Organizational Maintenance 32
Figure 23. Customer Wait Time for Organizational Maintenance showing Year over Year Comparison 32
Figure 24. Assessments from LRT Graphs 33
Figure 25. General Display for Logistics Response Time 35
Figure 26. Assessments from TDD Compliance Graphs 37
Figure 27. Assessments from TDD Compliance Graphs 38
Figure 28. DoD Perfect Order Fulfillment 39
Figure 29. Information Shown on Wholesale Supply Availability Graph 42
Figure 30. General Display for Wholesale Supply Availability 44
Figure 31. Display for On-Hand Backorders 44

Figure 32. Assessment from Materiel Denial Rate Graphs 46
Figure 33. General Display for Materiel Denial Rate 48
Figure 34. Information Shown on Logistics Cost Baseline Graph 50
Figure 35. Display of the Logistics Cost Baseline Percentage by Function Graph 51
Figure 36. Assessments from Inventory Value Graphs 52
Figure 37. Information Shown on Inventory Value Graph 53
Figure 38. Information Shown on Graph of Inventory Segmentation of No Demand Items 55
Figure 39. Sales Based Inventory Turn 57
Figure 40. Information Shown on Supply Management Costs Graph 59
Figure 41. General Display for Supply Management Costs 61
Figure 42. Display for Materiel Obligation Costs 61
Figure 43. Display for Management Costs 62
Figure 44. Information Shown on Supply Management Cost Changes Graph 63
Figure 45. General Display for Supply Management Cost Changes 65
Figure 46. Assessments from Excess On-Hand Graph 67
Figure 47. General Display for Excess On-Hand 69
Figure 48. Assessments from Due-In Potential Future Excess Graph 70
Figure 49. Information Shown on Due-In Long Supply Graph 71
Figure 50. General Display for Due-In Long Supply 73
Figure 51. Assessments from Forecast Accuracy Graph 74
Figure 52. Assessments from Forecast Bias Graphs 75
Figure 53. General Display for Forecast Accuracy and Forecast Bias 78
Figure 54. DoD-wide Item and Dollar Demand Accuracy Distributions 79
Figure 55. Forecast Accuracy and Bias Value-Added Measurements 80
Figure 56. Assessments from Unserviceable DLR Return Times Graph 81
Figure 57. General Display for Unserviceable DLR Return Time 83
Figure 58. Assessment from Unserviceable DLR Over-Aged Due-Ins Graph 84
Figure 59. General Display for Unserviceable DLR Returns Over-Aged Due-Ins 86
Figure 60. Assessments from Procurement Lead Time Graph 87
Figure 61. General Display for Procurement Lead Time 88
Figure 62. Assessments from Lead Time Variance Graph 90
Figure 63. General Display of Lead Time Variance 92
Figure 64. DoD Repair Cycle Time Distribution 94
Figure 65. Information Shown in Inventory Accessibility Graph 100
Figure 66. Information Shown on ERS Percentage Graph 103
Figure 67. General Display for ERS as a Percentage of Total Inventory 104
Figure 68. Information Shown in ERS Economic Benefit Table 105
Figure 69. Information Shown in CRS Percentage Graph 107
Figure 70. General Display for CRS as a Percentage of Total Inventory 108
Figure 71. Information Shown in CRS Reason Code Graph 109
Figure 72. Information Shown in Storage Costs Graph 111
Figure 73. Information Shown on Storage Footprint Graph 113
Figure 74. Information Shown on 0–10+ Years with No Demand Graph 115
Figure 75. Information Shown in PRS Disposition Chart 117
Figure 76. Information Shown in the Disposal Value Graph 119
Figure 77. Information Shown in AAO Percentage Graph 121
Figure 78. General Display for AAO Stocks as a Percentage of Inventory 122
Figure 79. Information Shown in AAO Segmentation Graph 124
Figure 80. Information Shown in Lateral Redistribution Graph 128
Figure 81. Information Shown in Procurement Offset Graph 129
Figure 82. Information Shown in RIC Participation Graph 131

Introduction



An Introduction to the DoD Supply Chain Metrics Guide

The DoD Supply Chain Metrics Guide provides DoD personnel with information on a standardized set of DoD-wide supply chain metrics for monitoring the health and performance of the DoD supply chain. Those metrics include enterprise level metrics that cross supply chain functions to describe the overall effectiveness of the DoD supply chain as well as functional level metrics that measure performance specific to the supply chain functions of inventory management and distribution management.

Guide Content

This introduction describes:

- The purpose of the guide
- The criteria that was used to select and develop the metrics in the guide
- How supply chain attributes serve as the analytical framework for the metrics in the guide.

Major Sections

This introduction is followed by sections that address the following:

- Metrics usage (how supply chain managers use the metrics to track performance and drive behavior)
- Enterprise level metrics by supply chain attribute, including
  - definitions for each enterprise metric,
  - comprehensive instructions on how to measure and use each metric, and
  - charts showing the measures over time.
- Functional level metrics associated with improving inventory management (with associated instructions and charts)
- Functional level metrics associated with improving distribution management (with associated instructions and charts)

Metric Descriptions and Instructions

For each metric in the enterprise and functional metrics sections, the Guide contains a comprehensive description of the metric and instructions on how it is measured and how it should be used. These items are highlighted:

- Use
- Definition
- Business value
- Office of the Secretary of Defense (OSD) data requirements (i.e., frequency and content of submission)
- Goals and trend analysis (i.e., performance goals and criteria for evaluating trends)

- Computational rules
- Interactions with other related metrics.

The instructions for each metric end with the direct relationships/interactions that metric has with other metrics. The cumulative sum of those relationships provides for an integrated view of the performance of the DoD supply chain.

Appendices

Appendix A displays the results of applying selection criteria to the established enterprise metrics.

Appendix B summarizes the data submission requirements for the supply chain enterprise metrics.

Appendix C lists the Supply Chain Metrics tools

Appendix D explains enterprise metrics data quality validations

Appendix E defines abbreviations used in the Guide.

Appendix F contains definitions of terms used in the Guide.

Purpose of the Guide

The Guide supplements DoD guidance on supply chain metrics contained in Volume 10 of the DoD Manual 4140.01, *Supply Chain Materiel Management Procedures* by describing

- how the metrics in the Guide were selected and how they relate to supply chain attributes;
- how the metrics are used to track performance against DoD supply chain goals;
- how each metric is defined, computed, displayed, and used; and
- the metric's business value and relationships with other metrics.

The metrics in this guide are collected and monitored by the DoD logistics community. For the purposes of this Guide, the DoD Supply Chain Community is defined as the military services, DLA, U.S. Transportation Command (USTRANSCOM), the Supply Chain Metrics Group (SCMG), the Supply Chain Executive Steering Committee (SCESC), and ODASD (Logistics).

Development–Selection Criteria

The SCMG[1] is responsible for developing and maintaining the supply chain enterprise metrics in the Guide.

Metrics Associated with Assessing Supply Chain Performance

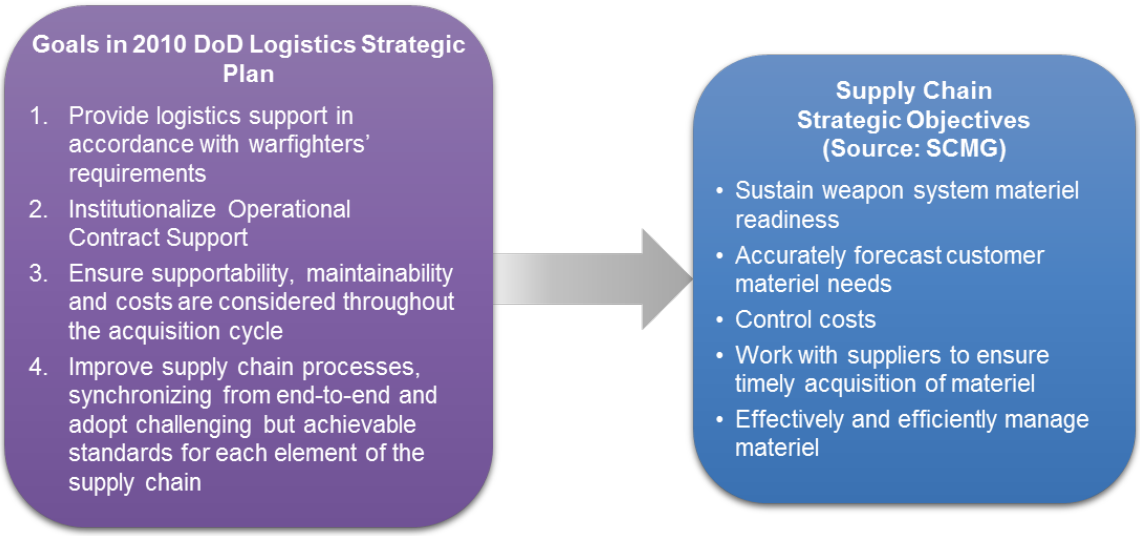
The SCMG uses the following five criteria to nominate the supply chain enterprise metrics that are reviewed and approved by DASD (Logistics) and published in this Guide:

1. *Do the metrics monitor the execution of actions that achieve enterprise strategic objectives?* As shown in Figure 1, the SCMG identified supply chain strategic objectives

[1] The SCMG is chaired by the ODASD(Logistics) and has members from the military services, DLA, USTRANSCOM, the U.S. Special Forces Command, and the General Services Administration.

against the goals in the 2010 DoD Logistics Strategic Plan.[2] A supply chain enterprise metric is mapped to one or more of those objectives.[3]

Figure 1. Supply Chain Strategic Objectives



2. *Do the metrics make sense and align with the processes addressed in DoD supply chain guidance?* Metrics should cross-reference to DoD supply chain guidance outlined in the DoD 4140.01 Instruction and Manual. The major supply chain processes of plan, source, make/maintain, deliver, and return are cited within that guidance. Within those processes, specific procedures are given for associated organizational elements of the supply chain. See Appendix A for the related policy process, specific procedures and organizational elements, and rationale for each of the selected enterprise metric.

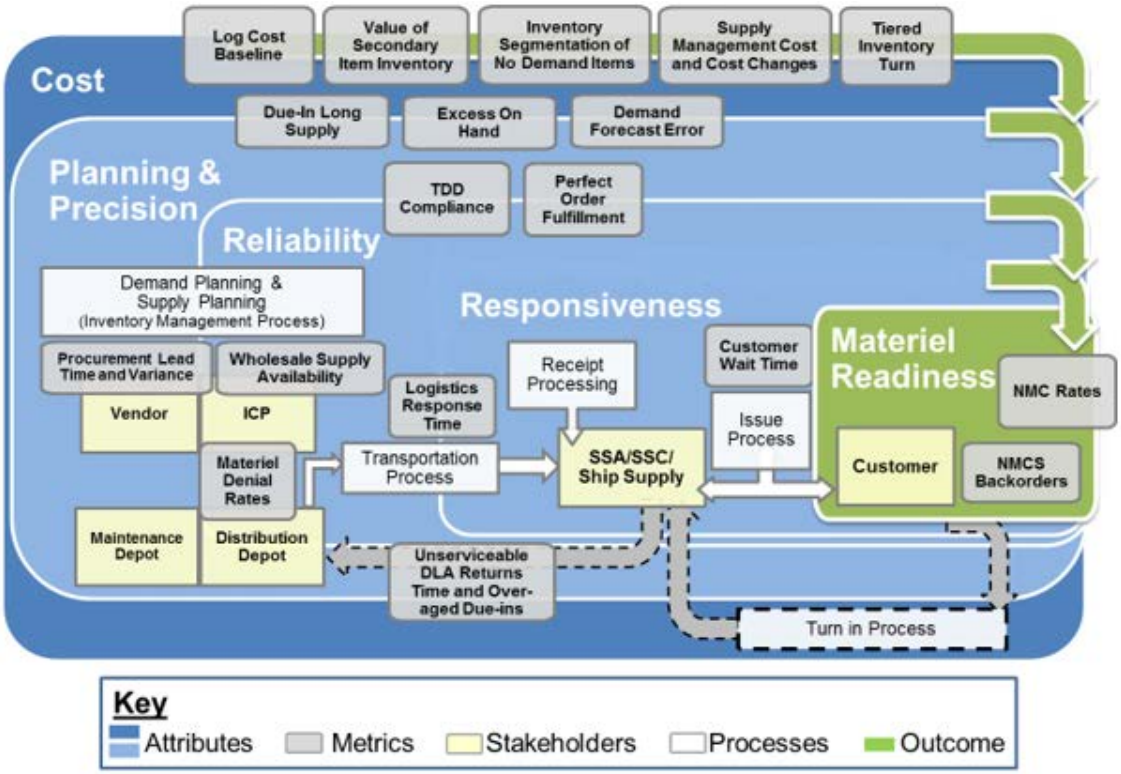
3. *Do the metrics drive behavior that supports logistics goals?* Desired behaviors are identified using the supply chain strategic objectives determined in Criterion 1. The identification focused on behaviors that optimize the results of actions to achieve the associated objective. As described in Appendix A under Criterion 3, metrics are selected that align with a desired behavior under a supply chain strategy objective.

4. *Do the metrics in the aggregate reflect the supply chain enterprise completely and span all DoD supply chain activities?* Developed by the SCMG, Figure 2 portrays a simplified end-to-end view of the DoD supply chain and shows the integrated relationships between supply chain activities and enterprise level metrics. All metrics are being collected from the DoD Components and aggregated to a DoD metric, where appropriate. Volume 10 of DoD Manual 4140.01 contains procedures on the enterprise-wide use of these metrics.

[2] The Logistics Strategic Plan was published in July 2010. The four goals within the Plan supported both the 2010 Quadrennial Defense Review's objectives and the DoD Strategic Management Plan's business priorities, outcomes, and goals.

[3] The development section of the description for each enterprise metric shows the supply chain strategic objective that the metric maps to.

Figure 2. Integrated Relationships between Supply Chain Enterprise Metrics



5. *Do the metrics align with metrics reviewed across the enterprise?* Metrics were cross-referenced against those used by senior leadership within the DoD Components to measure and monitor supply chain performance. In some cases, new metrics were selected to ensure full coverage of supply chain activities and fill information gaps identified by supply chain leadership.

Metrics Associated with Supply Chain Improvement Initiatives

In addition to supply chain enterprise metrics, the Guide contains two sets of functional level metrics dealing with two supply chain improvement initiatives. The Comprehensive Inventory Management Improvement Program (CIMIP) is the first initiative which grew out of a FY2010 National Defense Authorization Act requirement. It is a major initiative to reduce secondary item inventory excess through improvements in processes, metrics, and performance goals from demand forecasting to disposal identification. The targeted CIMIP improvement areas include actions, milestones, targets, and measures of success. In the Guide, CIMIP metrics such as excess on-order and due-in long supply can be found in the section on enterprise level metrics while other CIMIP metrics such as economic retention stocks as a percentage of total inventory are in the section on functional level metrics for inventory management.

The second initiative is improved distribution management, which covers the storage and shipment of materiel. In the Guide, distribution metrics such as logistics response time and materiel denial rates can be found in the section on enterprise level metrics.

Metrics and Supply Chain Attributes

To provide an analytical framework for presenting the metrics, the Guide links each metric to one of the following desired attributes for DoD supply chain management:

1. *Materiel readiness*—the 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 DoD supply chain.

2. *Responsiveness*—the ability of the DoD 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 DoD supply chain fulfills warfighter needs. This attribute is most representative of the customer's perspective of the DoD supply chain.

3. *Reliability*—the dependability and consistency of the supply chain providers to deliver required materiel support at a time and place specified by the customer. Reliability is key to DoD customer confidence in the DoD supply chain. This attribute focuses on how well the supply chain processes are being executed.

4. *Cost*—the price paid for the supply chain resources required to deliver a specific performance outcome. Cost effectiveness is key to right-sizing the DoD inventory investment and controlling supply chain costs. This attribute is an implied constraint on supply chain operations; it evaluates the DoD investment in the supply chain and assesses financial effects on supply chain customers.

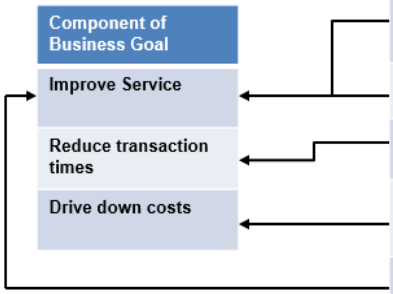
5. *Planning and precision*—the ability of the supply chain to accurately anticipate customer requirements and plan, coordinate, and execute accordingly. Planning and precision are key to DoD supply chain management. Their effectiveness affects all other attributes.

Attributes and Strategic Business Goals

Metrics, in general, focus on the enterprise business objectives and the progress used to achieve those objectives. The 2013 Defense Strategic Management Plan laid out seven business goals for the Department. Goal #6 was to "re-engineer or use end-to-end business processes to reduce transaction times, drive down costs, and improve service."[4] Figure 3 shows how the analytical framework for DoD supply chain metrics supports the three components of that Department business goal.

[4] DoD Strategic Management Plan, 2012-2013, Business Goal 6 monitored by the DoD Deputy Chief Management Officer with the AT&L key initiative: Improve the supply chain end-to-end process.

Figure 3. Strategic Goals and Metrics Analytical Framework



Metric Attribute	Relationship to Goal
Materiel Readiness	By measuring levels of service realized by warfighters and changes to those levels, metrics associated with this outcome quantify if service is being improved or at least, not being degraded.
Reliability	Metrics in this attribute quantify the consistency of the DoD supply chain in providing materiel support services.
Responsiveness	Metrics in this attribute quantify the speed that transactions process and determine if timeliness is improving or declining.
Cost	Metrics in this attribute quantify various costs associated with the DoD supply chain and if those costs are stable, increasing or decreasing.
Planning and Precision	Metrics in this attribute quantify the effectiveness of supply chain planning, which, if improved, will contribute to all the components of the business goal.

Metrics by Attribute

Figure 4 gives the attribute framework and where each enterprise and functional level metric is located within that framework. Each metric is characterized according to the following:

- The supply chain attribute it supports.
- Its overall orientation (outcome or diagnostic or measure of success). A metric is outcome-oriented if it measures the result of how the supply chain is performing. A metric is diagnostic if it measures a factor contributing to an outcome.
- Inventory management functional level metrics. Several metrics associated with improving inventory management measure one of the following major inventory segments:
    - Approved acquisition objective (AAO)—the total authorized requirements for an item of supply.
    - Economic retention stock (ERS)—inventory that is more economical to retain than to dispose and later repurchase.
    - Contingency retention stock (CRS)—inventory retained in case of specific contingency need.
    - Potential reutilization stock (PRS)—inventory above AAO requirements and retention stocks identified for potential reuse.

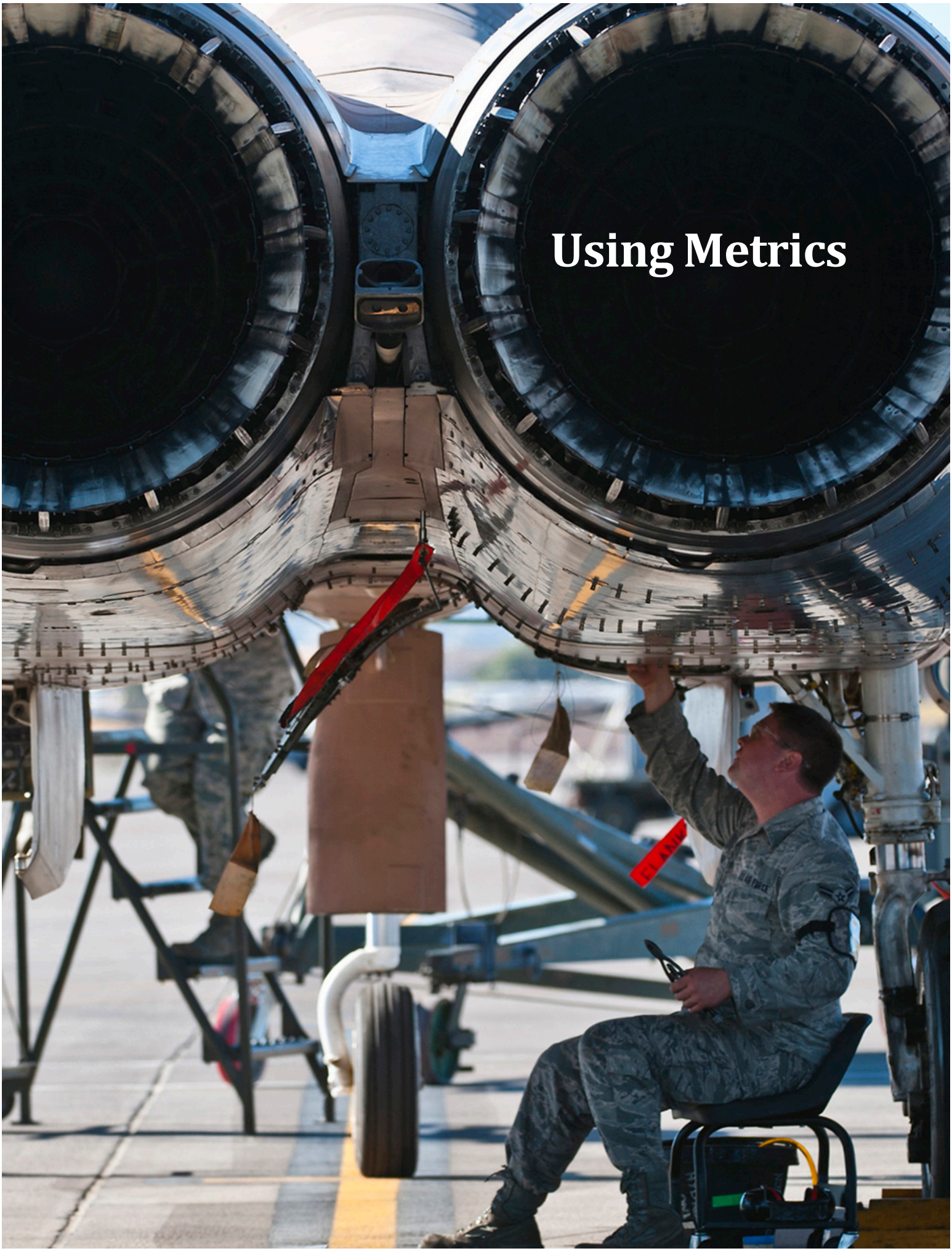
Figure 4. DoD Supply Chain Metrics Framework

Attribute	Enterprise level metrics		Functional level metrics	
	Outcome metrics	**Diagnostic metrics**	**Inventory Management**	**Distribution Management**
Materiel readiness	♦ Not mission capable (NMC) rates	♦ NMC supply (NMCS) backorders		
Responsive-ness	♦ Customer wait time (organizational maintenance)	♦ Logistics response time (LRT)		
Reliability	♦ TDD compliance	♦ Wholesale perfect order fulfillment (POF) ♦ Wholesale supply availability ♦ Materiel denial rates		
Cost	♦ Log cost baseline ♦ Value of secondary item inventory	♦ Inventory segmentation of no demand items ♦ Tiered inventory turns ♦ Supply management costs ♦ Supply management cost changes	♦ ERS as a percentage of total inventory ♦ Economic benefit of ERS ♦ CRS as a percentage of total inventory ♦ Secondary item stockage costs and stockage footprint ♦ Inventory dollars with 0–10+ years of no demand ♦ Inventory segmentation of no demand items ♦ PRS Disposition ♦ Disposal value of serviceable and unserviceable reparable and consumable items ♦ AAO as a percentage of total inventory	♦ Lateral redistribution ♦ Procurement offset
Planning and Precision	♦ Excess on-hand ♦ Due-in potential future excess	♦ Demand forecast accuracy and bias ♦ Unserviceable DLR return time ♦ Unserviceable DLR over-aged due-ins ♦ Procurement lead time ♦ Procurement lead time variance	♦ Inventory accessibility ♦ CRS reason codes ♦ AAO breakout by category ♦ Repair Cycle Time	

Guide Updates

This Guide will be updated as the metrics under development are completed, or as changes to measures of supply chain business processes or goals become necessary.

Using Metrics



Using Metrics

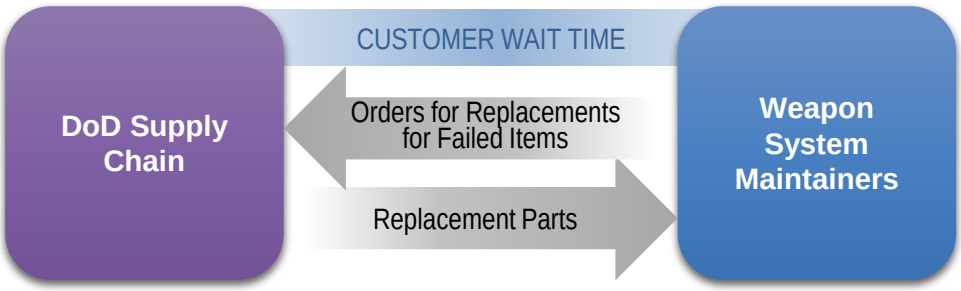
Supply chain managers use metrics to track performance and drive behavior. Metrics provide an objective approach to analyzing key elements of the supply chain by making available quantitative measures of how well the supply chain is performing. By highlighting problem areas and opportunities for improvement, these measures offer insight into how supply chain managers should proceed. Analysis and use of performance information is the foundation for objective decision making within the DoD supply chain.

This section provides examples of how supply chain managers currently use metrics to track performance and drive behavior. A comprehensive description of each metric identified in this section is provided in one of the subsequent sections to include its use, definition, business value, data requirements, goals and trend analysis, computational rules, and interactions with other related metrics. This section closes with an example of how to use metrics data as a guide to explore and explain performance problems.

Using Metrics to Monitor Weapon System Support to Warfighters

A weapon system is ready to perform its mission when its mission-related components are functioning. When components fail, weapon system maintainers depend on the supply chain to provide replacements to get the weapon system ready. As illustrated in Figure 5, the customer wait time (CWT) measures the time it takes to order and receive a replacement component or part.

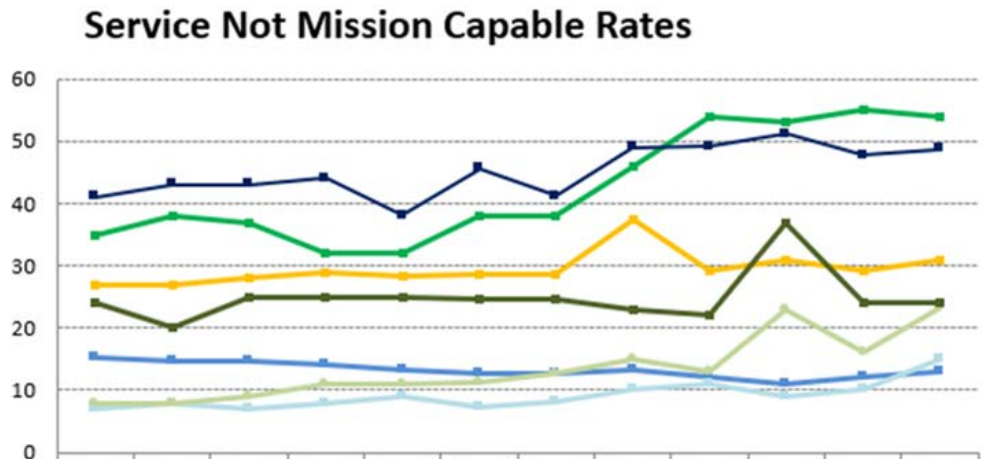
Figure 5. The Role of the Customer Wait Time



CWT is the key enterprise metric used to evaluate the responsiveness of the supply chain to customers who are maintaining weapon systems.

The outcome measures of weapon system readiness are mission capable rates; however, the analysis of supply chain support to weapon system readiness is served by evaluating not mission capable (NMC) rates. NMC rates are used to evaluate the supply chain's effectiveness because the effects of supply and maintenance can be identified separately using the NMC sub-metrics of NMC-Supply (NMCS) rates and NMC-Maintenance (NMCM) rates. NMC rates quantify the percentage of time weapon systems are not ready to perform their assigned missions. The rates are computed by weapon system operators external to the DoD supply chain and serve as an independent validation of the materiel support provided to weapon systems. As shown in Figure 6, the rates are first reviewed at the major weapon system group level. Any negative trend or anomaly is then diagnosed at the weapon systems level, when rates are reviewed for both supply- and maintenance-related events that would cause a weapon system to be in an inoperable status.

Figure 6. Not Mission Capable Rates for Major Weapon System Groups

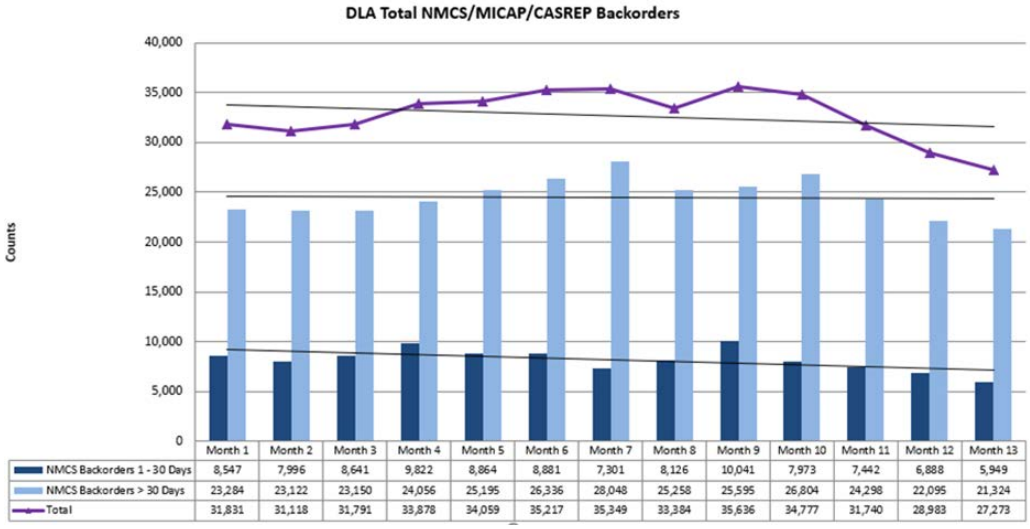


	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4
Navy Ships Rate	35	38	37	32	32	38	38	46	54	53	55	54
Naval Aircraft Rate	41	43	43	44	38	46	41	49	49	51	48	49
MC Systems Rate	15	15	15	14	13	13	13	13	12	11	12	13
AF Aircraft Rate	27	27	28	29	28	29	29	37	29	31	29	31
Army Missiles Rate	7	8	7	8	9	7	8	10	11	9	10	15
Army Ground Rate	8	8	9	11	11	11	13	15	13	23	16	23
Army Aircraft Rate	24	20	25	25	25	25	25	23	22	37	24	24

If supply-related rates or CWT indicate a problem, NMCS Backorders is used to identify drivers of poor supply. NMCS Backorders is the count of outstanding backorders associated with an NMCS condition. These NMCS backorders, which indicate a weapon system is inoperable, accumulate at the wholesale source of supply because the required materiel is not available at either the retail or the wholesale level of supply.

Figure 7 shows the measurements associated with NMCS backorders.

Figure 7. Not Mission Capable Supply Backorders



	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13
NMCS Backorders 1 - 30 Days	8,547	7,996	8,641	9,822	8,864	8,881	7,301	8,126	10,041	7,973	7,442	6,888	5,949
NMCS Backorders > 30 Days	23,284	23,122	23,150	24,056	25,195	26,336	28,048	25,258	25,595	26,804	24,298	22,095	21,324
Total	31,831	31,118	31,791	33,878	34,059	35,217	35,349	33,384	35,636	34,777	31,740	28,983	27,273

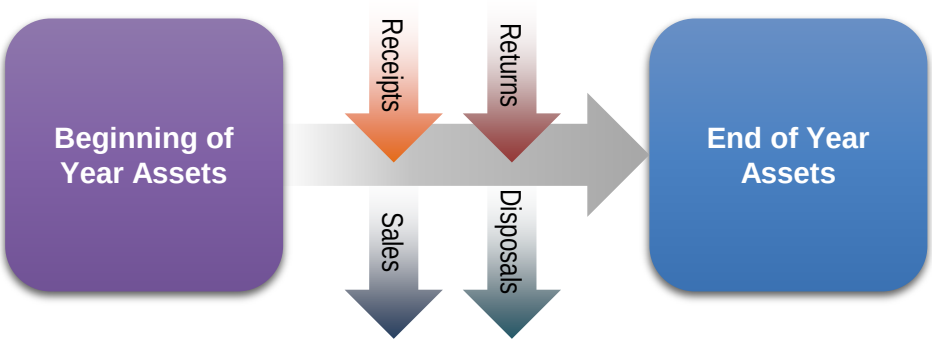
Growth in the backorder counts above can be an indication of future readiness problems. As the number of backorders greater than 30 days increases, there is an increased likelihood of rising NMC rates.

Using Metrics to Track Inventory Management Improvements

The DoD inventory stratification process applies on-hand and due-in assets to authorized inventory requirements and approved economic and contingency levels. Assets that are excess to those requirements and levels are identified as PRS. A Department goal is to minimize excess inventories to the maximum extent possible.

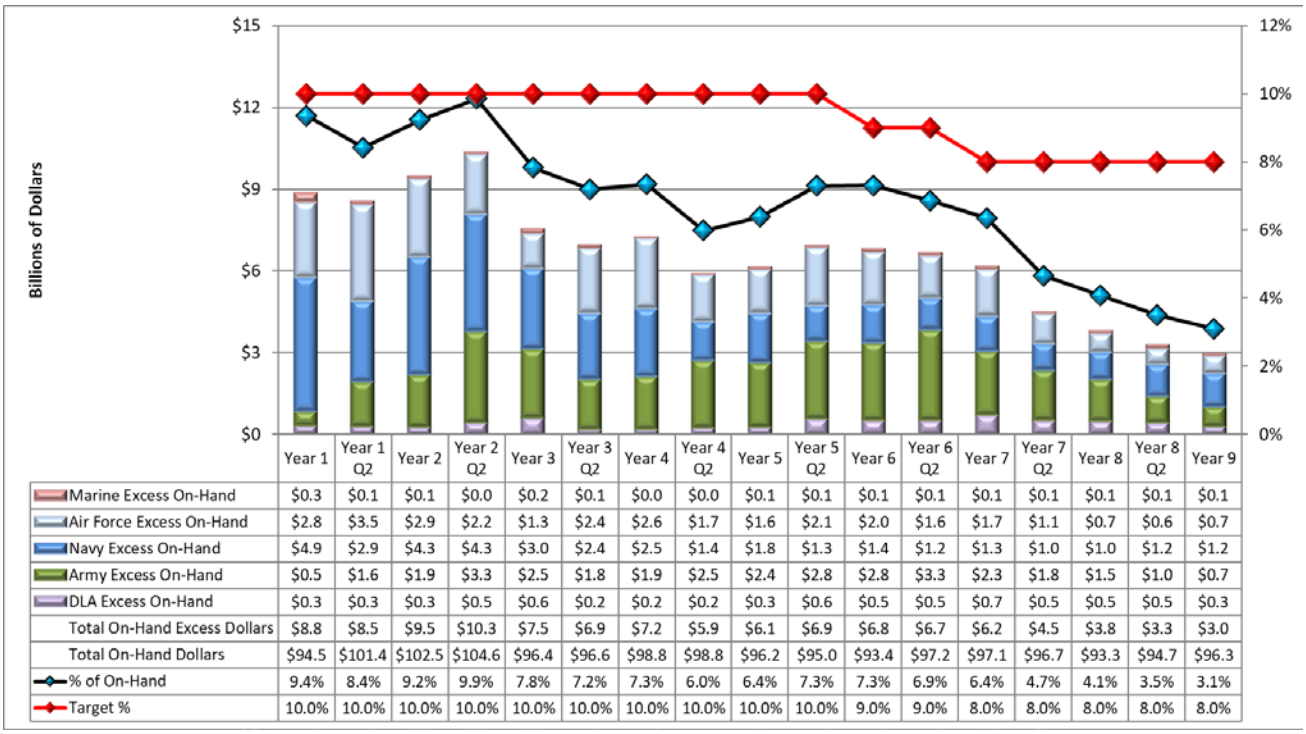
The DoD Supply Chain Community reviews how inventory requirements and assets change over time. Metrics are collected to monitor increases and decreases in inventory. Both procurement receipts and customer returns are collected as increases to inventory, and sales and disposals, can be captured as decreases to inventory. Figure 8 illustrates how the collective result provides a complete picture of how inventories are changing.

Figure 8. Secondary Item Inventory Changes



To track the success of the Department's efforts to reduce excess inventory, two metrics are used. The first metric, excess on-hand (shown in Figure 9), is the dollar value of PRS and its percentage of the total inventory value that it represents.

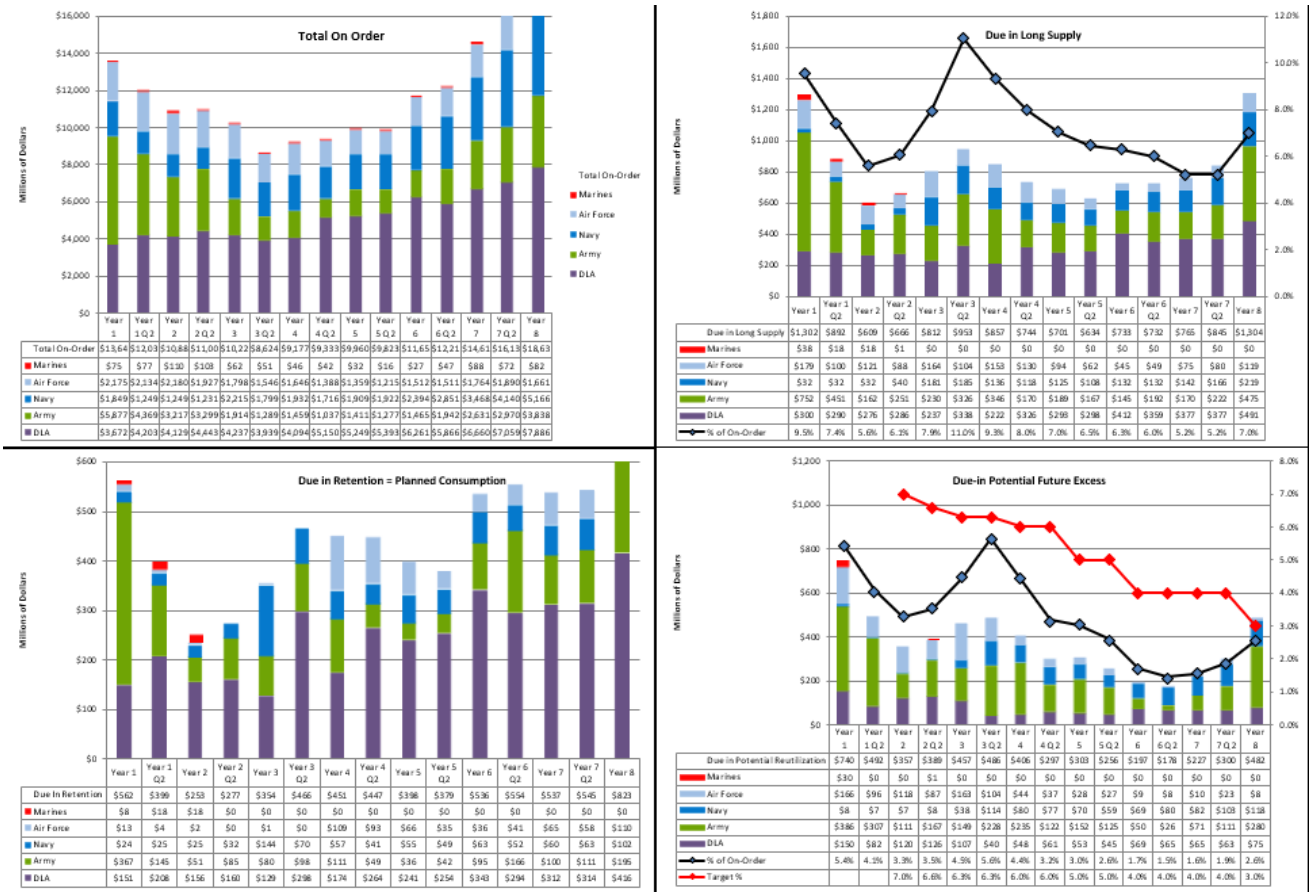
Figure 9. Government Managed Excess On-Hand



	Year 1	Year 1 Q2	Year 2	Year 2 Q2	Year 3	Year 3 Q2	Year 4	Year 4 Q2	Year 5	Year 5 Q2	Year 6	Year 6 Q2	Year 7	Year 7 Q2	Year 8	Year 8 Q2	Year 9
Marine Excess On-Hand	$0.3	$0.1	$0.1	$0.0	$0.2	$0.1	$0.0	$0.0	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
Air Force Excess On-Hand	$2.8	$3.5	$2.9	$2.2	$1.3	$2.4	$2.6	$1.7	$1.6	$2.1	$2.0	$1.6	$1.7	$1.1	$0.7	$0.6	$0.7
Navy Excess On-Hand	$4.9	$2.9	$4.3	$4.3	$3.0	$2.4	$2.5	$1.4	$1.8	$1.3	$1.4	$1.2	$1.3	$1.0	$1.0	$1.2	$1.2
Army Excess On-Hand	$0.5	$1.6	$1.9	$3.3	$2.5	$1.8	$1.9	$2.5	$2.4	$2.8	$2.8	$3.3	$2.3	$1.8	$1.5	$1.0	$0.7
DLA Excess On-Hand	$0.3	$0.3	$0.3	$0.5	$0.6	$0.2	$0.2	$0.2	$0.3	$0.6	$0.5	$0.5	$0.7	$0.5	$0.5	$0.5	$0.3
Total On-Hand Excess Dollars	$8.8	$8.5	$9.5	$10.3	$7.5	$6.9	$7.2	$5.9	$6.1	$6.9	$6.8	$6.7	$6.2	$4.5	$3.8	$3.3	$3.0
Total On-Hand Dollars	$94.5	$101.4	$102.5	$104.6	$96.4	$96.6	$98.8	$98.8	$96.2	$95.0	$93.4	$97.2	$97.1	$96.7	$93.3	$94.7	$96.3
% of On-Hand	9.4%	8.4%	9.2%	9.9%	7.8%	7.2%	7.3%	6.0%	6.4%	7.3%	7.3%	6.9%	6.4%	4.7%	4.1%	3.5%	3.1%
Target %	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	9.0%	9.0%	8.0%	8.0%	8.0%	8.0%	8.0%

The second metric, due-in potential future excess is the dollar value of due-in long supply (DILS) that stratifies to PRS. Long supply assets stratify above an individual item's authorized requirements (i.e., it is AAO). Normally, procurements do not exceed the AAO; however, requirements for an item may decline after a contract is awarded, causing quantities on contract and on-hand to be greater than the AAO. Figure 10 breaks out on-contracts dollars that are within and above the AAO in different long supply categories. While on-order stock within the AAO meet a peacetime or wartime requirement, on-order stock above the AAO does not have a requirement and is subject to contract termination. However, only the PRS portion of DILS would be identified as excess on-hand if they are brought into the DoD supply chain. On the other hand, the ERS and CRS portions of DILS would have future demand in the long term or contingency usage that justifies their retention if it is brought into the DoD supply chain.

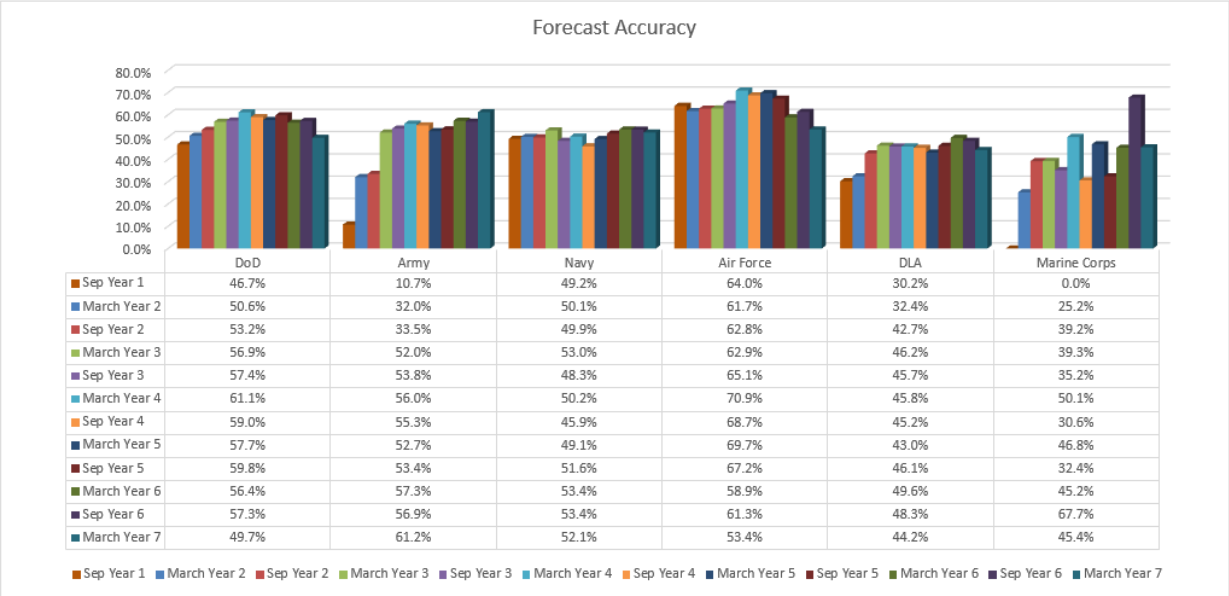
Figure 10. Due-In Long Supply



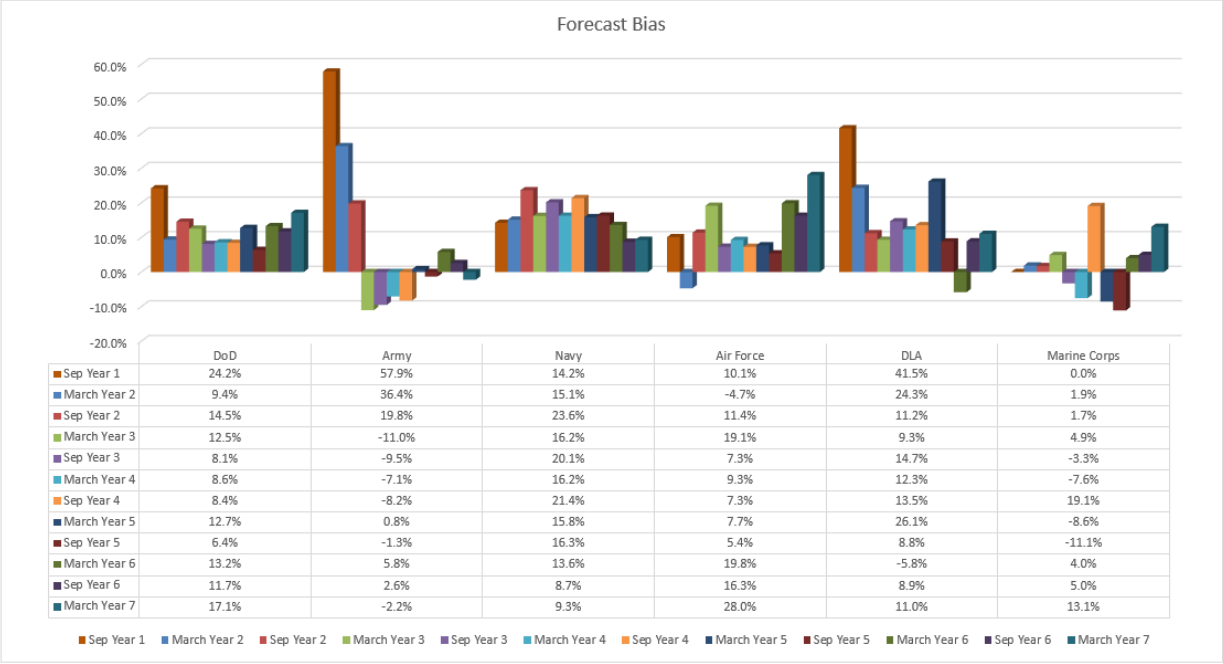
Two additional metrics used to monitor excess focus on systemic drivers of excess inventory: forecast error (divided into forecast accuracy and forecast bias) and procurement lead-time variance. Forecast accuracy and forecast bias measure the ability of materiel managers to predict future customer demand. If forecasts are higher than actual demand, then the requirements levels based on those forecasts will be too high and, in time, will result in excess inventory. If forecasts are lower than actual demand, then inventory levels may not be enough to meet demand and the result would be backorders.

Forecast accuracy measures that difference between an item's forecast and its actual demand. If the difference is positive—a positive bias—then the item is over-forecasted; a forecast of 100 with actual demand of 80 would be an example of over-forecasted demand. If the difference is negative—a negative bias—then the item is under-forecasted; a forecast of 80 with actual demand of 100 would be an example of under-forecasted demand. While both examples would have an accuracy of 80%, the first example would have a positive bias of 20% and the second example would have negative bias of -25%. Figure 11 illustrates how these two metrics look when item forecasts and demand are aggregated to a Component and DoD level.

Figure 11. Forecast Accuracy and Forecast Bias



	DoD	Army	Navy	Air Force	DLA	Marine Corps
Sep Year 1	46.7%	10.7%	49.2%	64.0%	30.2%	0.0%
March Year 2	50.6%	32.0%	50.1%	61.7%	32.4%	25.2%
Sep Year 2	53.2%	33.5%	49.9%	62.8%	42.7%	39.2%
March Year 3	56.9%	52.0%	53.0%	62.9%	46.2%	39.3%
Sep Year 3	57.4%	53.8%	48.3%	65.1%	45.7%	35.2%
March Year 4	61.1%	56.0%	50.2%	70.9%	45.8%	50.1%
Sep Year 4	59.0%	55.3%	45.9%	68.7%	45.2%	30.6%
March Year 5	57.7%	52.7%	49.1%	69.7%	43.0%	46.8%
Sep Year 5	59.8%	53.4%	51.6%	67.2%	46.1%	32.4%
March Year 6	56.4%	57.3%	53.4%	58.9%	49.6%	45.2%
Sep Year 6	57.3%	56.9%	53.4%	61.3%	48.3%	67.7%
March Year 7	49.7%	61.2%	52.1%	53.4%	44.2%	45.4%

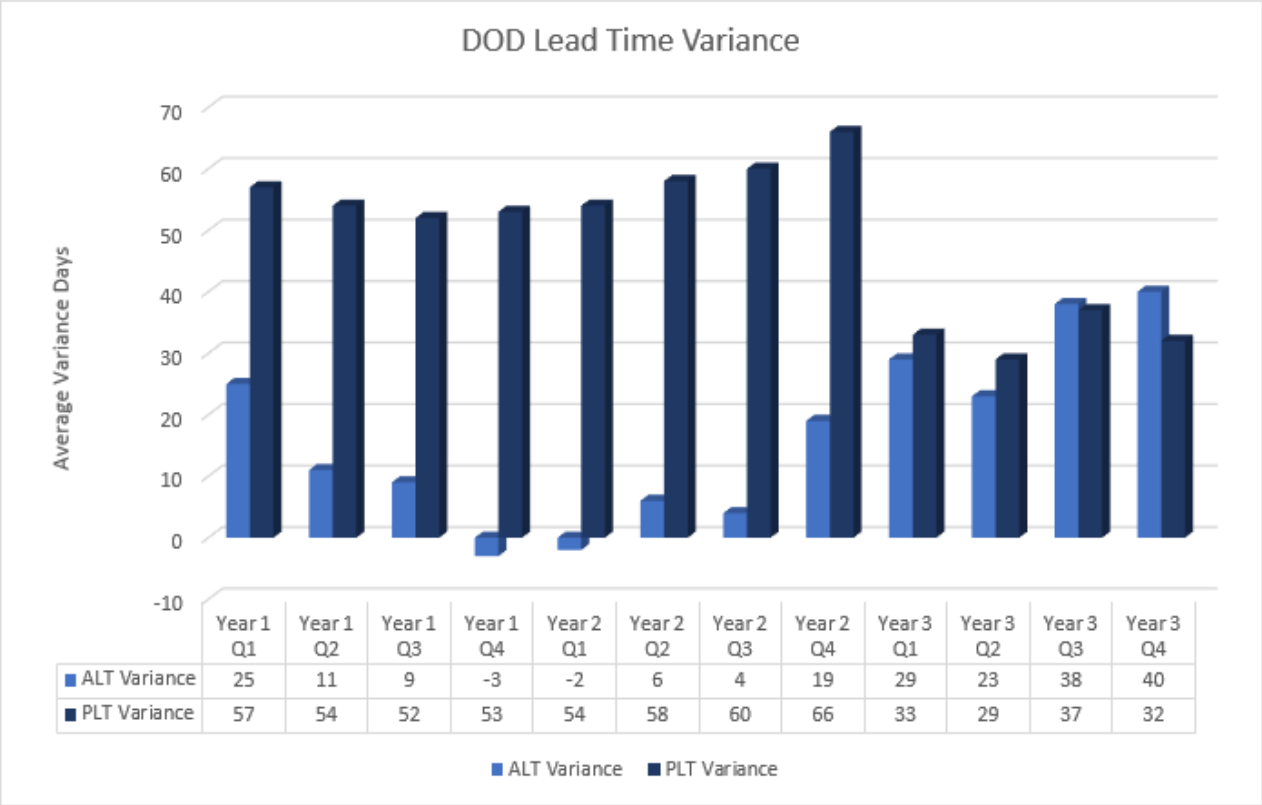


	DoD	Army	Navy	Air Force	DLA	Marine Corps
Sep Year 1	24.2%	57.9%	14.2%	10.1%	41.5%	0.0%
March Year 2	9.4%	36.4%	15.1%	-4.7%	24.3%	1.9%
Sep Year 2	14.5%	19.8%	23.6%	11.4%	11.2%	1.7%
March Year 3	12.5%	-11.0%	16.2%	19.1%	9.3%	4.9%
Sep Year 3	8.1%	-9.5%	20.1%	7.3%	14.7%	-3.3%
March Year 4	8.6%	-7.1%	16.2%	9.3%	12.3%	-7.6%
Sep Year 4	8.4%	-8.2%	21.4%	7.3%	13.5%	19.1%
March Year 5	12.7%	0.8%	15.8%	7.7%	26.1%	-8.6%
Sep Year 5	6.4%	-1.3%	16.3%	5.4%	8.8%	-11.1%
March Year 6	13.2%	5.8%	13.6%	19.8%	-5.8%	4.0%
Sep Year 6	11.7%	2.6%	8.7%	16.3%	8.9%	5.0%
March Year 7	17.1%	-2.2%	9.3%	28.0%	11.0%	13.1%

Although 100% accuracy and 0% bias would be ideal, they are not realistic with the Department as demand volatility will always cause accuracy to be less than ideal and bias to be positive or negative over time. Currently, the Department is working to limit the volatility that materiel managers must deal with when forecasting demand.

Procurement lead time variance is the difference between the production lead time (PLT) and administrative lead time (ALT) used in resupply planning and the actual ALT and PLT for procurement actions. If planning lead times are greater than the actual lead times, procured materiel will be received into the supply system before it is needed. This results in long supply and, in some cases, excess inventory. If planning lead times are less than the actual times, procured materiel will not be received into the supply system when it is needed. This results in backorders Figure 12illustrates the overstatement and understatement of procurement lead times.

Figure 12. Procurement Lead Time Variances



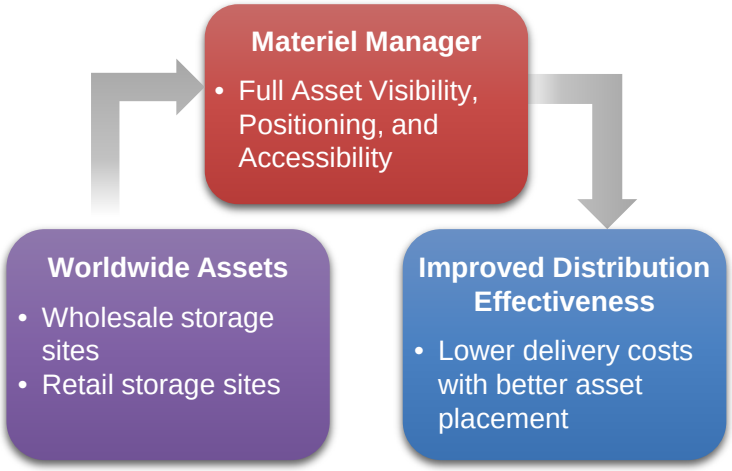
	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4
ALT Variance	25	11	9	-3	-2	6	4	19	29	23	38	40
PLT Variance	57	54	52	53	54	58	60	66	33	29	37	32

Using Metrics to Track the Impact of Improved Asset Visibility and Accessibility and its impact on Distribution Effectiveness

System-wide visibility allows materiel managers to access and apply excess assets to requirements at retail sites to fill worldwide needs. The assets can be used to offset procurements needed to sustain wholesale inventory levels or to fulfill demands the manager had to backorder because of a lack of stock.

The effectiveness of distribution within the DoD supply chain can be gauged by the time and cost to deliver materiel to customers. To provide lower costs for delivery with the same or better timeframes, materiel managers must have full visibility and access to assets across the supply chain (see Figure 13), as well as the ability to position assets where they are needed.

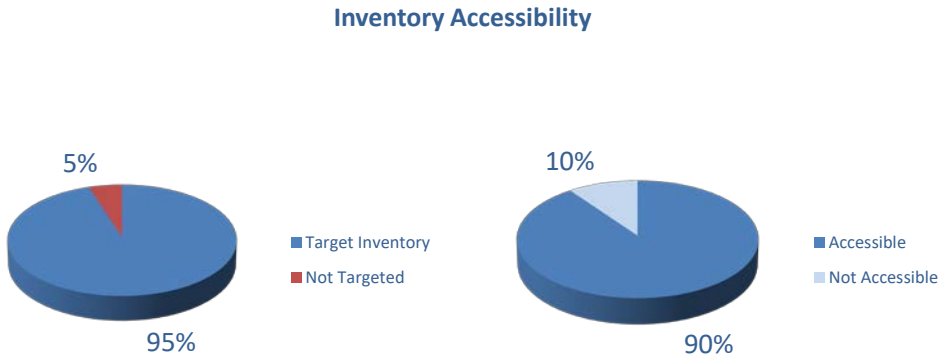
Figure 13. Requirements for Improved Distribution Effectiveness



Delivery time and number of backordered deliveries focus attention on declining performance of the DoD distribution system. Transportation costs and the value of stored inventory monitor the cost of the DoD distribution system.

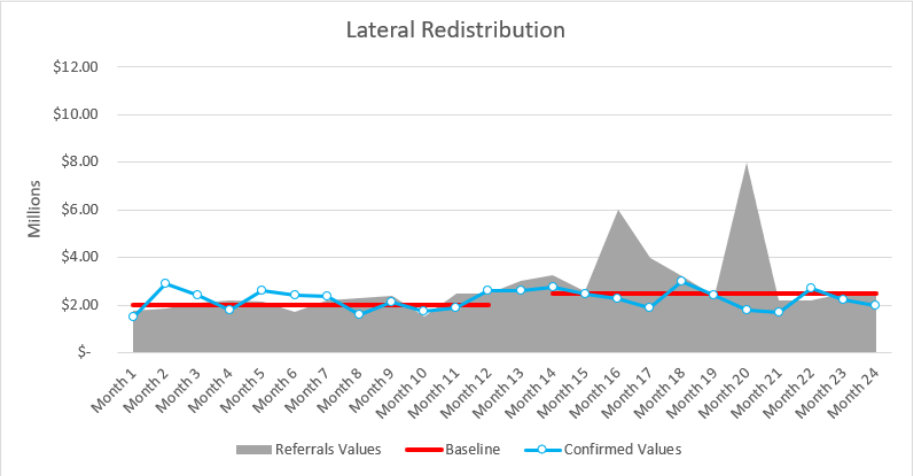
Figure 14 shows the 2-part DoD-wide inventory accessibility metric. The first part of the metric—represented by the pie on the left—gives the percent of total inventory that is targeted for accessibility. The mission requirements of select deployed units require that their inventories not be targeted for accessibility. The second part of metric—represented by the pie on the right—shows the percent of targeted inventory that is accessible.

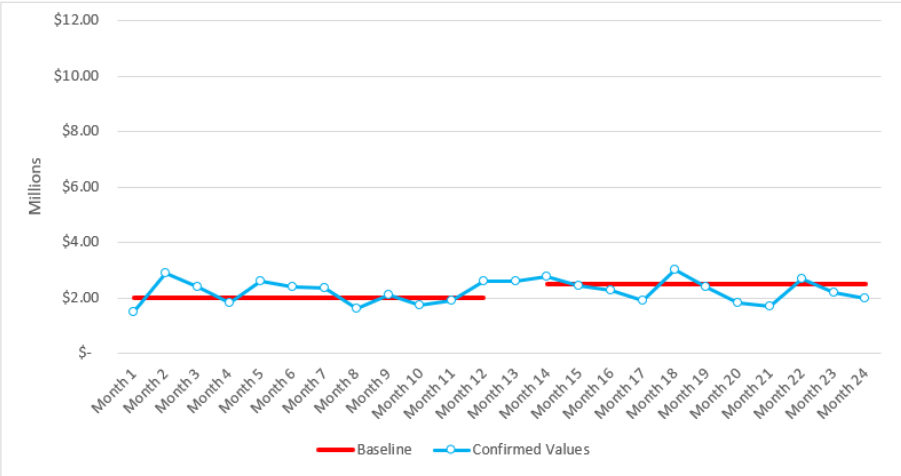
Figure 14. DoD-wide Inventory Accessibility



Inventory accessibility has both economic and performance benefits for the DoD supply chain. A performance benefit is that, through lateral redistribution, excess stock at some retail supply activities can be used to fill otherwise backordered demands placed by other retail activities. An economic benefit is that excess stock at retail supply activities can be used to offset the amount of stock that needs to be procured (and bought into the supply system) when wholesale stock levels are low. DLA tracks benefits (in dollars) from both lateral redistribution and procurement offsets, as shown in Figure 15.

Figure 15. Lateral Redistribution and Procurement Offset Savings





As military units train and deploy around the world, the demand for secondary items is changing—in quantities needed and specific customer locations. This continuously transforming customer environment requires better visibility and accessibility, as well as a superior level of performance from DoD wholesale materiel managers.

Using Metrics to Explore and Explain a Performance Problem: An Example

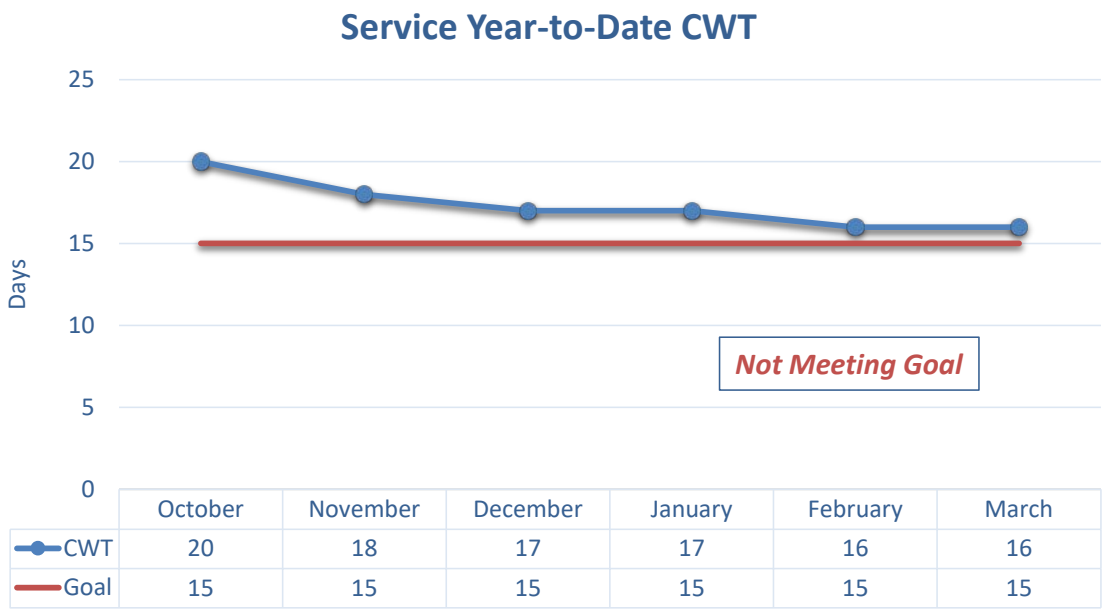
To illustrate how the supply chain enterprise and functional metrics can be used to assess performance, the following example provides a case where a performance goal is not being met. In this case, the performance goal in question is the annual CWT that a military service has for its customers—15 days for delivery of service-managed items to its organizational maintenance customers.

During a mid-year review of its year-to-date CWT, performance was reported as 16 days. An analyst was tasked to identify what problems were causing the service not to meet its goal, what was being done to resolve those problems, and what additional actions needed to be taken.

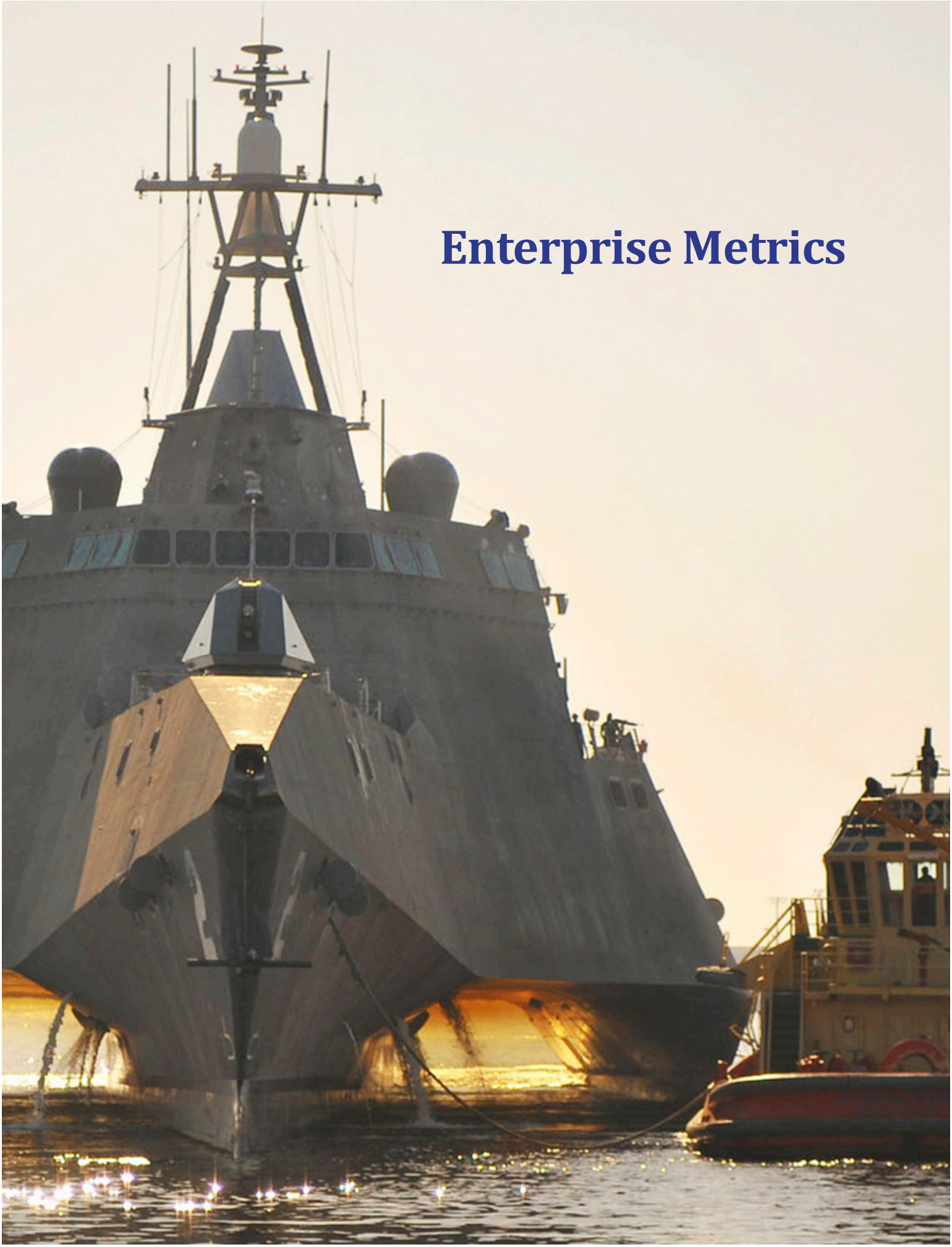
First, the analyst reviewed the monthly year-to-date performance for CWT from the start of the year. Figure 16 shows that performance. He observed that in October, performance was four days

above where it should have been but was approaching goal as the year progressed. Further analysis was required.

Figure 16. Problem Measurements



	October	November	December	January	February	March
CWT	20	18	17	17	16	16
Goal	15	15	15	15	15	15



Enterprise Metrics

Enterprise Level Metrics

The suite of standardized enterprise metrics described within this section were developed to monitor performance across supply chain functions and hierarchies. By evaluating both the effectiveness of the supply chain and the cost efficiency of resource planning, leadership is provided with the necessary tools to assess the health of the DoD supply chain.

As described in the Introduction, this Guide links each metric to one of the following desired attributes for DoD supply chain management: materiel readiness, responsiveness, reliability, cost, and planning and precision. The attributes are defined in Appendix D.

This section contains detailed information on the suite of established enterprise level metrics, grouped by supply chain attribute. The information includes a comprehensive description of each metric and instructions on how the metric is measured and how it should be used. Charts showing measurements over time are included to help interpret the performance of each metric.

Due to the scope and complexity of the DoD supply chain, a comprehensive assessment of its performance requires a review of all enterprise metrics in this Guide and their interrelationships. In some cases, performance cannot be determined by looking at the metric itself; it must be assessed in concert with the performance of other related metrics. In such cases, the related metrics are provided for review in conjunction with the targeted metric.

Monitoring the suite of enterprise level metrics is also important to the Department's efforts to improve the DoD supply chain. Maximizing the performance in one metric could have a negative effect on another equally important metric. For example, minimizing supply chain costs without a process improvement may degrade customer materiel support. Therefore, no metric should be viewed in isolation.

Materiel Readiness Metrics

Description

Definition of Materiel Readiness as a DoD Supply Chain Attribute

The ability of the supply chain to support weapon systems in undertaking and sustaining their assigned missions at planned peacetime and wartime utilization rates.

Assessment Objective for Attribute

Determine if the mission capabilities of weapon systems are degraded because of a decline in supply chain support.

Materiel Readiness Metrics

Outcome Metric:	Not Mission Capable (NMC) Rates NMC Rates are further broken out into NMC due to Supply (NMCS) and NMC due to Maintenance. Portrays how well the supply chain supports the materiel needs of weapon systems or groups of weapon systems. The SCMG tends to focus on not mission capable due to supply.
Diagnostic Metric:	Not Mission Capable Supply (NMCS) Backorders Two factors have a negative impact on NMC rates: (1) the number of wholesale NMCS backorders and (2) the age of the backorder.

The Not Mission Capable (NMC) Rate Metric

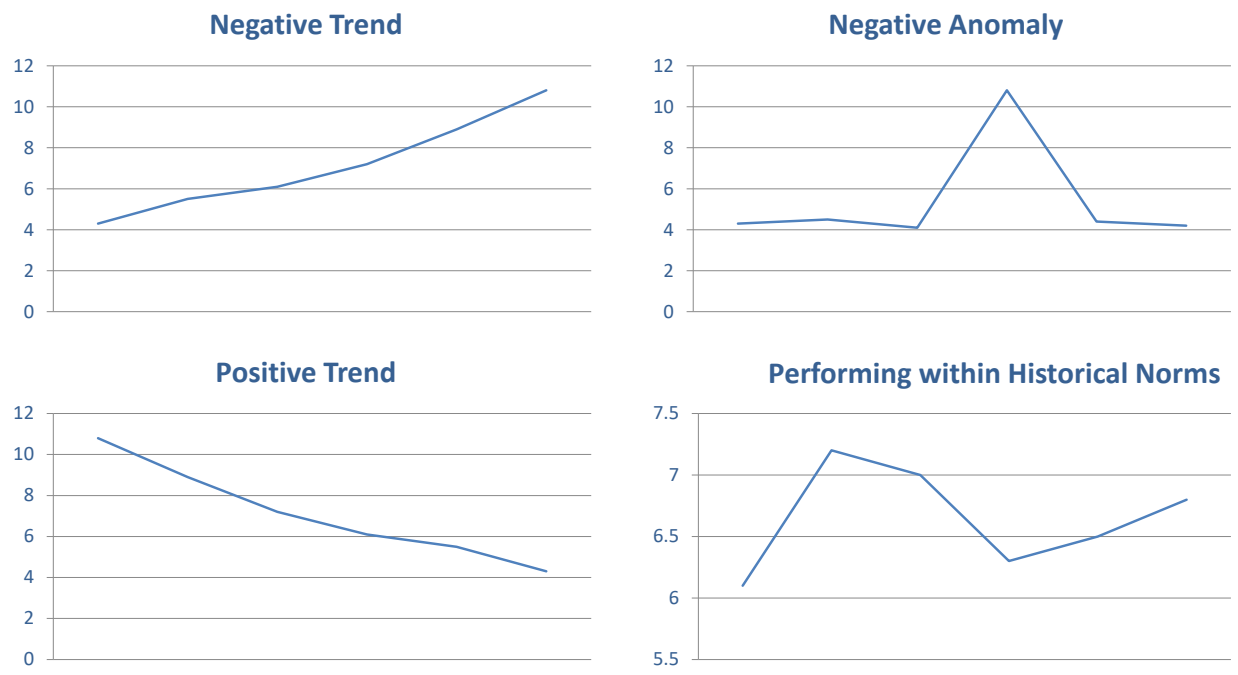
Use of the NMC Rates Metric

Measured at the weapon system level and summarized by weapon system groupings, this metric serves as an independent indicator of how well the supply chain is meeting the needs of the warfighter. It is also used as a risk indicator to evaluate the effect of changes in supply chain processes to improve support to the warfighter.

While NMC rates assess overall weapon system readiness, the NMCS rate is directly tied to supply chain performance. The NMCS rate reflects the delay in obtaining replacements for failed items that are preventing a weapon system from performing its mission. There is a strong relationship between CWT (for NMCS demands) and NMCS rates; however, this relationship can be masked by workarounds, such as cannibalization (i.e., using parts extracted from other inoperable weapon systems).

The notional graphs in Figure 17 illustrate the general conclusions that can be made from plotting the NMC rates over time. Increasing rates are negative, in that they show degradation of readiness. Decreasing rates are positive in that they show improving readiness. One-time spikes or jumps in rates are negative anomalies.

Figure 17. Assessments from NMC Rate Graphs



Development of the NMC Rates Metric

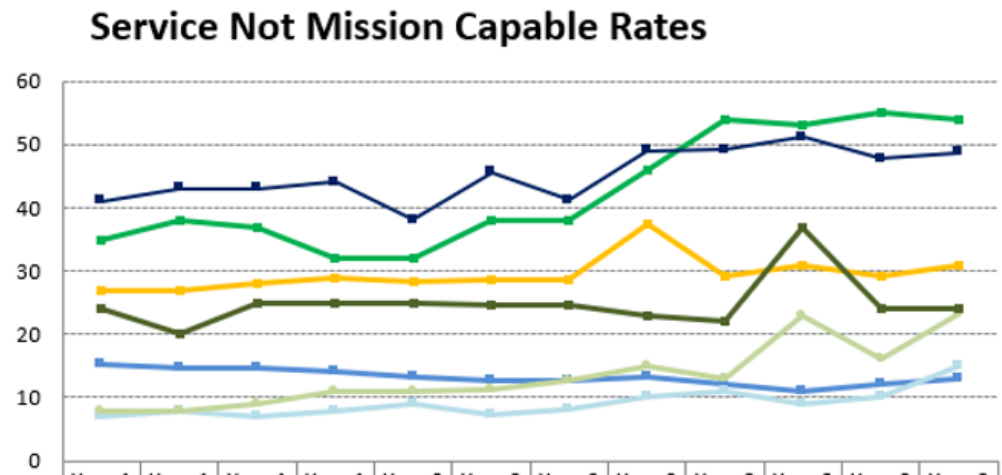
Supported Supply Chain Strategic Objective	Sustain weapon system materiel readiness.
Attribute	**Materiel readiness:** This metric represents: ▪ the readiness outcome that the supply chain contributes to ▪ focus on weapon system or groups of weapon systems This metric quantifies ▪ the effect of the supply chain materiel support on the readiness of weapon systems or groups of weapon systems
External or Internal	**External:** Collected by the military services and reported as part of the data collection process from the Under Secretary of Defense for Personnel and Readiness.

Description of the NMC Rates Metric

Definition	The percentage of time that a materiel condition exists, indicating that systems and equipment are not capable of performing any of their assigned missions because of maintenance requirements (NMCM) or a maintenance work stoppage due to a supply shortage (NMCS). (Definition in DoD Instruction 3110.05, Readiness-based Materiel Condition Reporting for Mission-Essential Systems and Equipment, and in Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms.)

Business Value	Although not an internal supply chain performance measurement, this metric serves as the principal measurement for assessing the outcome of the support provided to the warfighter by the DoD supply chain. The breakout of this metric into NMCS and NMCM rates allows materiel managers to relate weapon system readiness problems to either supply support or maintenance support.
Goals and Trend Analysis	**Goals** • Each Service sets goals for weapon system readiness. These goals can vary by different operational communities, expected operational status, and type model/design model specifications. Goals can change over time. **Trend**: A downward trend in NMC rates is positive; an upward trend is negative.
Computation	The military services compute rates in accordance with the Defense Readiness Reporting System, DoD Instruction 3110.05. For purposes of this metric, C3 and C4 casualty reports [C3/C4 CASREPs] are an NMC condition for Navy ships, submarines, and shipboard systems.
OSD Data Requirements	**Frequency:** Quarterly submission by the military services **Content:** MC rates for aggregate weapon system groups and key weapon systems are listed in the Quarterly Readiness Report to Congress. Besides NMCM and NMCS rates, submissions should include applicable FMC rates, PMC rates, and MC rates. For Navy ships, equivalent rates are the percentage of time with C3/C4 CASREPs.
General Display	NMC rates by military service weapon system groupings, with additional displays by service weapon system categories and/or weapon system showing all submitted NMCS and NMCM rates as well as applicable FMC, MC, and PMC rates and related cannibalization data. shows the general display for NMC rates by military weapon system.

Figure 18. General Display for Not Mission Capable Rates

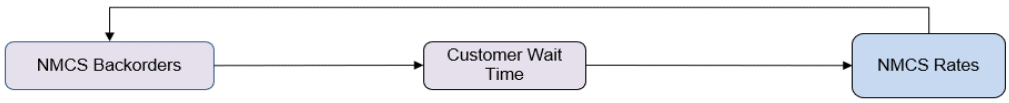


	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4
Navy Ships Rate	35	38	37	32	32	38	38	46	54	53	55	54
Naval Aircraft Rate	41	43	43	44	38	46	41	49	49	51	48	49
MC Systems Rate	15	15	15	14	13	13	13	13	12	11	12	13
AF Aircraft Rate	27	27	28	29	28	29	29	37	29	31	29	31
Army Missiles Rate	7	8	7	8	9	7	8	10	11	9	10	15
Army Ground Rate	8	8	9	11	11	11	13	15	13	23	16	23
Army Aircraft Rate	24	20	25	25	25	25	25	23	22	37	24	24

Relationship of the NMC Rates Metric to Other Metrics

The metrics presented below address only the supply contributors to NMCS rates.

Key Relationships:



Customer Wait Time	The responsiveness of the supply chain to fill orders for materiel to sustain the readiness of weapon systems is measured by the average CWT that organizational maintenance experiences when ordering replacement components. If that time increases, NMC rates could increase, unless short-term workarounds (like cannibalization) are used. The impact of CWT on NMC rates can be reduced temporarily by cannibalization actions (controlled or selective substitution) that take working components out of some already inoperable weapon systems to reduce the downtime for other weapon systems.

NMCS Backorders	NMCS backorders represent the set of requisitions for replacement components needed immediately for repair of inoperable systems and often results in the longest response times. An increase in the total number of NMCS backorders causes NMCS rates to increase.
Rate of Cannibalization Actions	Cannibalization is a workaround for NMC rates and, as such, can mask rate declines. If the rate of cannibalization actions increases while the NMC rate remains steady or increases, it is an indication that the readiness of the weapon system is declining.

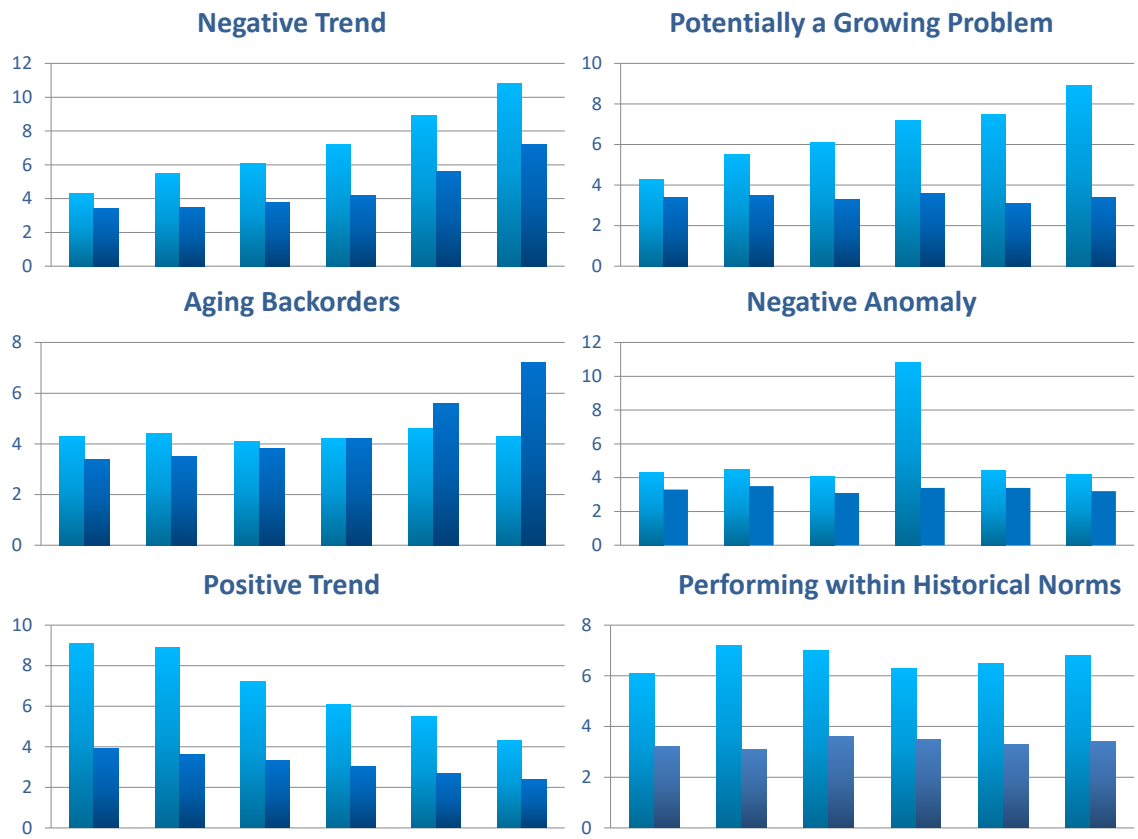
Not Mission Capable Supply (NMCS) Backorders

Use of the NMCS Backorders Metric

If a materiel order that is causing an NMCS condition is not filled by the DoD supply chain, it becomes an NMCS backorder at the wholesale level. An increasing number of NMCS backorders indicates that customer service to the warfighter is declining.

The notional graphs in Figure 19 illustrate the general conclusions that can be made from plotting NMCS backorders over time. The metric reports the number of NMCS backorders 1–30 days old (illustrated with light blue in Figure 19) and those more than 30 days sold (illustrated with dark blue in Figure 19). NMCS backorders older than 30 days indicate more serious NMCS problems.

Figure 19. Assessments from NMCS Backorder Graphs



Development of the NMCS Backorders Metric

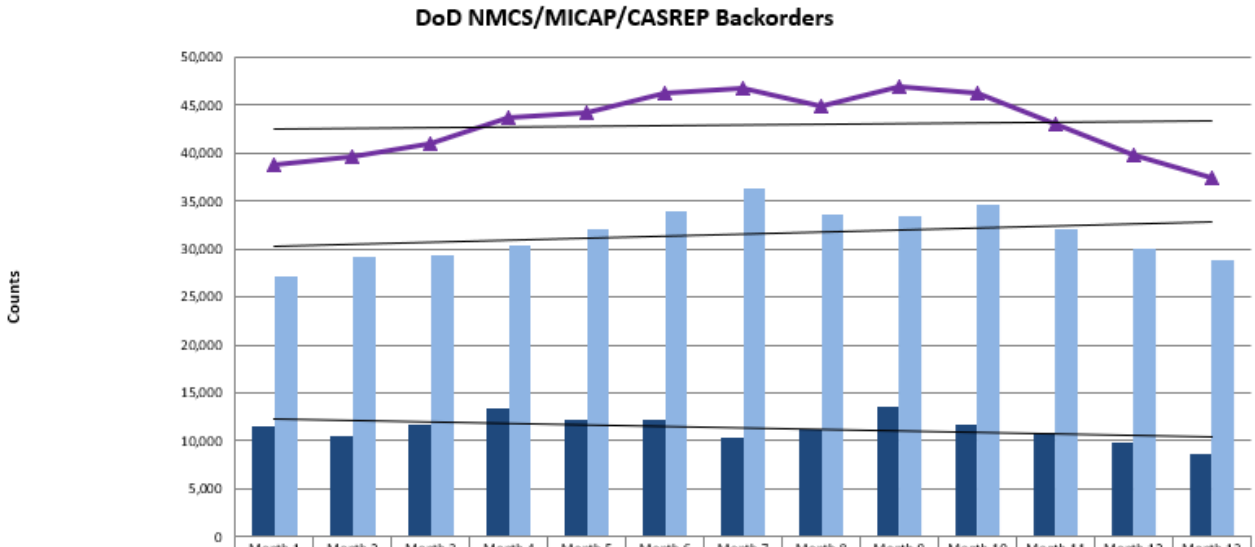
Supported Supply Chain Strategic Objective	Sustain weapon system materiel readiness.

Attribute	**Materiel readiness:** An NMCS backorder indicates a weapon system cannot perform its mission until a replacement part is provided to maintenance.
External or Internal	**Internal:** This metric is collected within the DoD supply chain at the wholesale echelon of supply.

Description of the NMCS Backorders Metric

Definition	The number of wholesale backorders that are associated with an NMCS condition (grouped for recognition of those backorders) up to 30 days old and those older than 30 days.
Business Value	Because NMCS backorders generally constitute the longest delays associated with NMC rates, this metric serves as a principal measurement of the supply chain's effect on service to the warfighter.
Goals and Trend Analysis	**Goals:** The DoD Components do not have goals for this metric; they track changes in counts and age. **Trend:** A downward trend in NMCS backorders is positive; an upward trend is negative.
Computation	The following backordered requisitions are counted by their time on backorder: • A "999", "E__", or "N__" in a requisition's required delivery date indicates a NMCS condition. (See Volume 2 of Defense Logistics Manual [DLM] 4000.25-M) • A "W" in the first digit of the serial number of a requisition document number indicates a C2/C3/C4 CASREP condition. (See Naval Supply Systems Command Publication 485). To separate C2 CASREPs from C3/C4 CASREPs, the Navy relies on a separate CASREP file.
OSD Data Requirements	**Frequency:** Monthly submission by military services and DLA inventory control points. **Content:** On-hand backorders for requisitions that are coded to reflect a NMCS or ship CASREP condition divided between backorders that are 0–30 days old and those >30 days old.
Drill Down Measurements	As it becomes available, the DoD Components provide information on: • Numbers of NMCS demands in a month • Numbers of NMCS demand in a month that are backordered • Average time to fill an NMCS backorder
General Display	*NMCS backorders counts by age.* shows the general display for NMCS backorders counts by age.

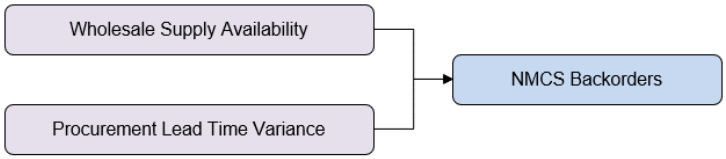
Figure 20. General Display for Not Mission Capable Supply Backorders



	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13
NMCS Backorders 1 - 30 Days	11,596	10,437	11,620	13,344	12,148	12,150	10,379	11,187	13,554	11,651	10,892	9,856	8,597
NMCS Backorders >30 Days	27,070	29,173	29,366	30,295	32,005	33,970	36,254	33,574	33,400	34,586	32,028	29,935	28,768
Total	38,666	39,610	40,986	43,639	44,153	46,120	46,633	44,761	46,954	46,237	42,920	39,791	37,365

Relationship of the NMCS Backorders Metric to Other Metrics

Key Relationships:



Wholesale Supply Availability	Wholesale supply availability measures the effectiveness of the wholesale echelon in filling all requisitions, including NMCS requisitions. As wholesale supply availability increases, the number of NMCS backorders should decrease. (See wholesale supply availability for other metrics that affect it and, in turn, affect the number of NMCS backorders.)
Procurement lead time variance	Procurement lead time variance quantifies the suppliers' ability to deliver to the DoD supply chain as predicted. If the variance indicates a high degree of late deliveries, this could cause NMCS backorders to increase. If the variance indicates a high degree of early deliveries, this could cause NMCS backorders to decrease.

Responsiveness Metrics

Description

Definition of Responsiveness as a DoD Supply Chain Attribute

The ability of the supply chain to respond to customer materiel requests according to their priority by providing the right support when and where it is needed.

Assessment Objective for Attribute

Determine if the supply chain is supporting readiness and satisfying its customers in a timely manner.

Responsiveness Metrics

Outcome Metric:	Customer Wait Time for Organizational Maintenance (CWT_{OM}) Quantifies the responsiveness of the DoD supply chain to orders placed by weapon system maintainers. It is the customer-facing metric of the DoD supply chain.
Diagnostic Metrics:	Logistics Response Time (LRT) If LRT is increasing or is extended beyond time definite delivery (TDD) standards because of stock shortages, distance to customer, transportation mode, etc., the delay in filling requisitions can affect the CWT or service associated with unavailability of materiel at the retail activities that submit those requisitions.

Customer Wait Time for Organizational Maintenance (CWT_{OM})

Use of the CWT_{OM} Metric

This metric evaluates the time required to provide materiel in response to orders from maintainers directly supporting weapon systems (that is, organizational maintenance or field maintenance, where intermediate maintenance does not exist). The weapon systems may be involved in training and contingency operations.

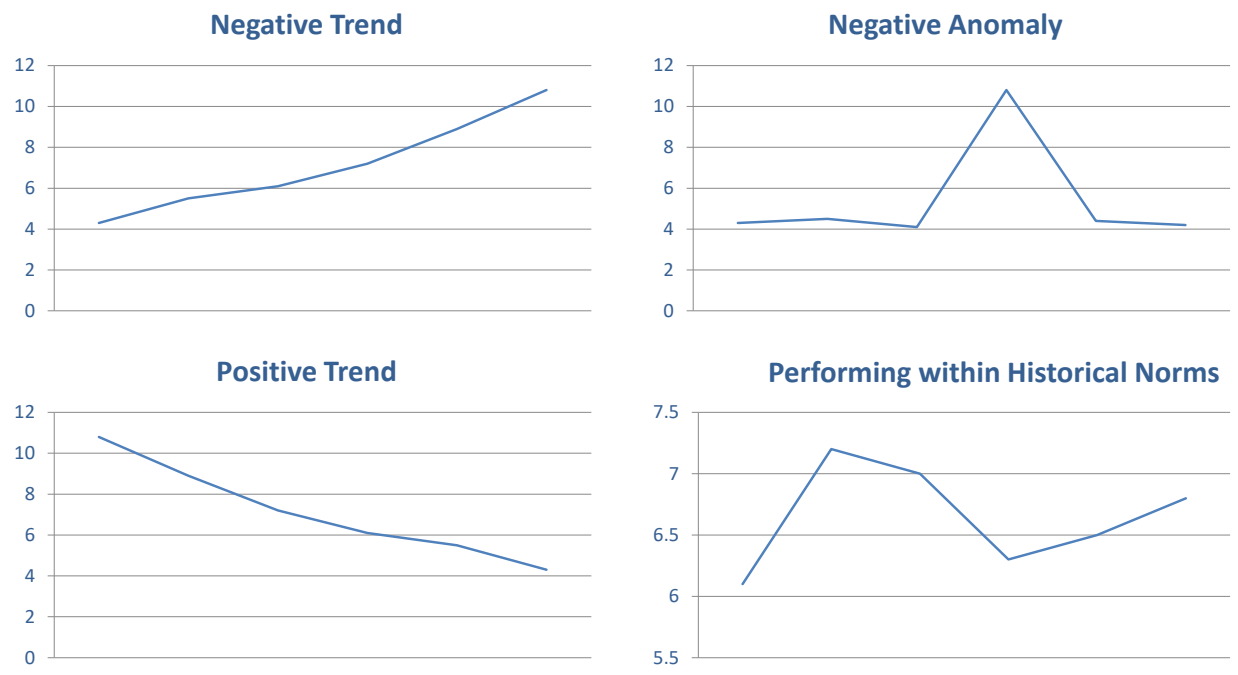
This metric represents the last customer-facing metric in the DoD supply chain. As such, its transaction time is how the end-use customer judges the responsiveness of the DoD supply chain.

The Army, Navy, Air Force, and Marine Corps have CWT_{OM} goals. These goals are set for a cumulative average of the fiscal year. Times that are at or below these goals meet targeted performance, while times above the goals do not.

In addition, there is a year-over-year comparison in which monthly performance is displayed. This display enables the group to determine if there are cyclical trends and illustrates patterns from one year to the next.

The notional graphs in Figure 21 illustrate the general conclusions that can be made from plotting CWT over time. Increasing times are negative, in that they show greater delays in providing needed materiel. Decreasing times are positive, in that they show a reduction in delays. A one-time spike or jumps in CWT_{OM} are negative anomalies that are researched to identify a cause.

Figure 21. Assessments from CWT_{OM} Graphs



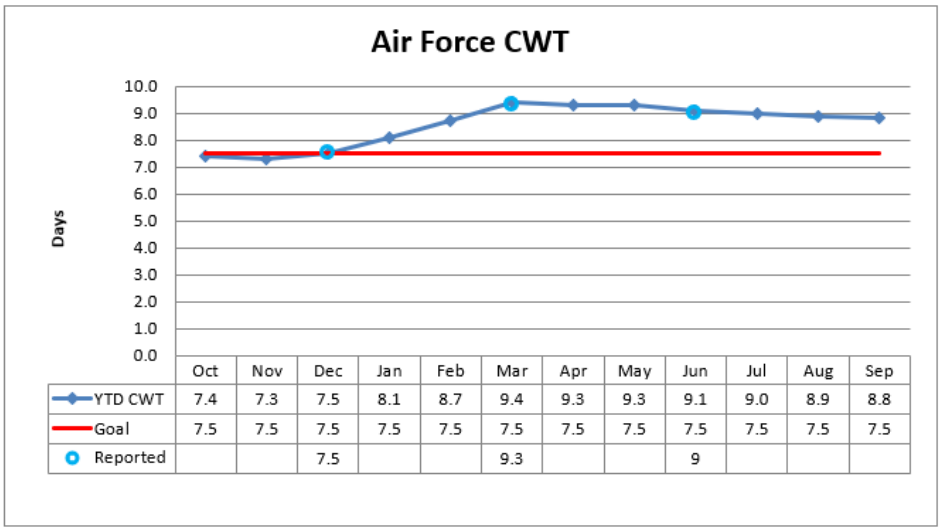
Development of the CWT_{OM} Metric

Supported Supply Chain Strategic Objective	Sustain weapon system materiel readiness.
Attribute	**Responsiveness:** This metric measures supply chain responsiveness and the associated support to weapon system materiel readiness. Timely receipt of replacement parts by organizational maintenance is critical to reducing the time to replace failed parts. CWT_{OM} quantifies the time to receive those replacement parts. As such, it represents the outcome of the supply chain in supporting the maintenance actions that directly affect the readiness of weapon systems or groups of weapon systems.
External or Internal	**Internal:** Each military service collects the data it needs to report on this metric.

Description of the CWT_{OM} Metric

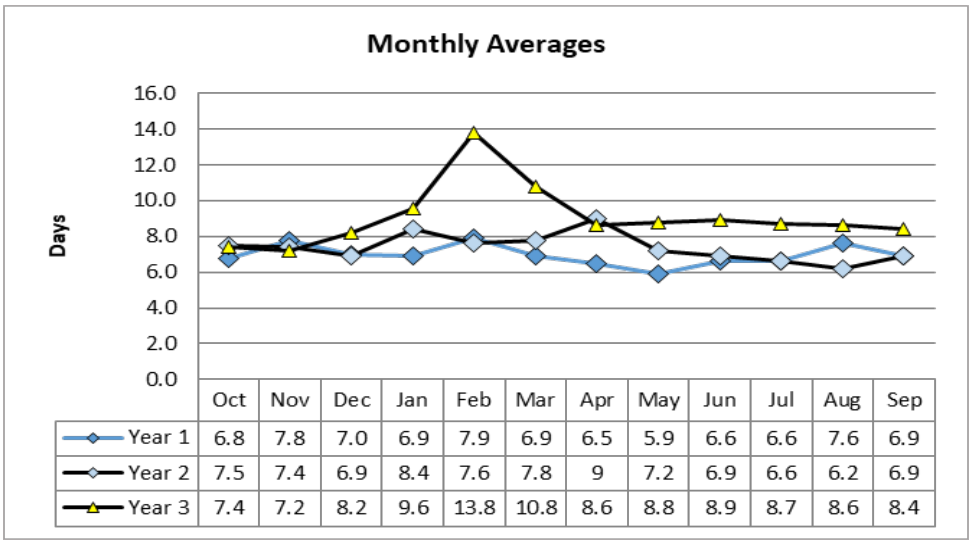
Definition	The total elapsed time between the submission of a customer order from organizational maintenance and the receipt of that order by organizational maintenance.
Business Value	By showing the outcome to the customer, this metric • indicates how responsive the DoD supply chain is from an end user's perspective, and • links supply chain performance to the operational availability of weapon systems as the mean logistics delay time factor.
Goals and Trend Analysis	**Goals:** Performance goals are set by the military services. **Trend:** A downward trend in CWT is positive; an upward trend is negative.
Computation	This metric is computed as the average CWT_{OM} for a month, but it excludes the 1% of observations that represent the longest times. Those times are normally attributable to data errors or extraordinary circumstances and, therefore, are not representative of normal supply chain responsiveness. Besides the average monthly CWT_{OM}, the military services compute the year-to-date CWT_{OM} for their customers and measure it against their fiscal year goals. The monthly 1% exclusion rule also applies to this metric. After applying the 1% rule to the total aggregate population of their customer requests, a military services may also apply filters to either (1) focus on the items it manages and/or urgency customer demands or (2) exclude observations outside of the 1% rule that are known to be non-representative of the service's process generating CWT_{OM} (e.g., demands worked manually by a supply activity that temporarily lost its materiel management system). The Army calculation does not capture the time between receipt at the supply support activity and the customer pick-up.
OSD Data Requirements	(1) **Frequency:** Monthly **Content:** Individual records for each order placed by a weapon system's field-level maintainers. (2) **Frequency:** Quarterly **Content:** For the military services with annual performance goals, their year-to-date reported performance against their goal.
General Display	By military service; the year-to-date performance against goals as well as the monthly performance for all sources of supply, and separately for DLA and the military services. Figure 22 shows the general display for CWT_{OM}. *By military service; the monthly performance for the current fiscal year compared to the two most recent fiscal years.* shows the general display for CWT_{OM} for year over year comparison.

Figure 22. General Display for Customer Wait Time for Organizational Maintenance



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
YTD CWT	7.4	7.3	7.5	8.1	8.7	9.4	9.3	9.3	9.1	9.0	8.9	8.8
Goal	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Reported			7.5			9.3			9			

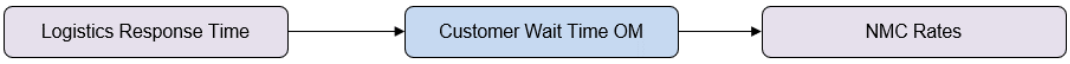
Figure 23. Customer Wait Time for Organizational Maintenance showing Year over Year Comparison



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Year 1	6.8	7.8	7.0	6.9	7.9	6.9	6.5	5.9	6.6	6.6	7.6	6.9
Year 2	7.5	7.4	6.9	8.4	7.6	7.8	9	7.2	6.9	6.6	6.2	6.9
Year 3	7.4	7.2	8.2	9.6	13.8	10.8	8.6	8.8	8.9	8.7	8.6	8.4

Relationship of the CWT$_{OM}$ Metric to Other Metrics

Key Relationships:



NMCS Rates	The responsiveness of the supply chain to fill orders for materiel to sustain the readiness of weapon systems is measured by the average CWT that organizational maintenance experiences when ordering replacement

	components. If wait time increases, NMCS rates will increase, which lead to an increase of NMC rates as a whole unless workarounds, like cannibalization (disassembly of parts from inoperable systems for use in the repair of other weapon systems), are used.
Logistics Response Time	Measures the speed of the wholesale echelon in delivering requisitioned materiel, including materiel going directly to weapon system maintainers when unavailable in forward stockage points. Reducing the LRT will put materiel on retail shelves faster and provide faster delivery of materiel going directly to maintainers (i.e., lower CWT).

Logistics Response Time (LRT)

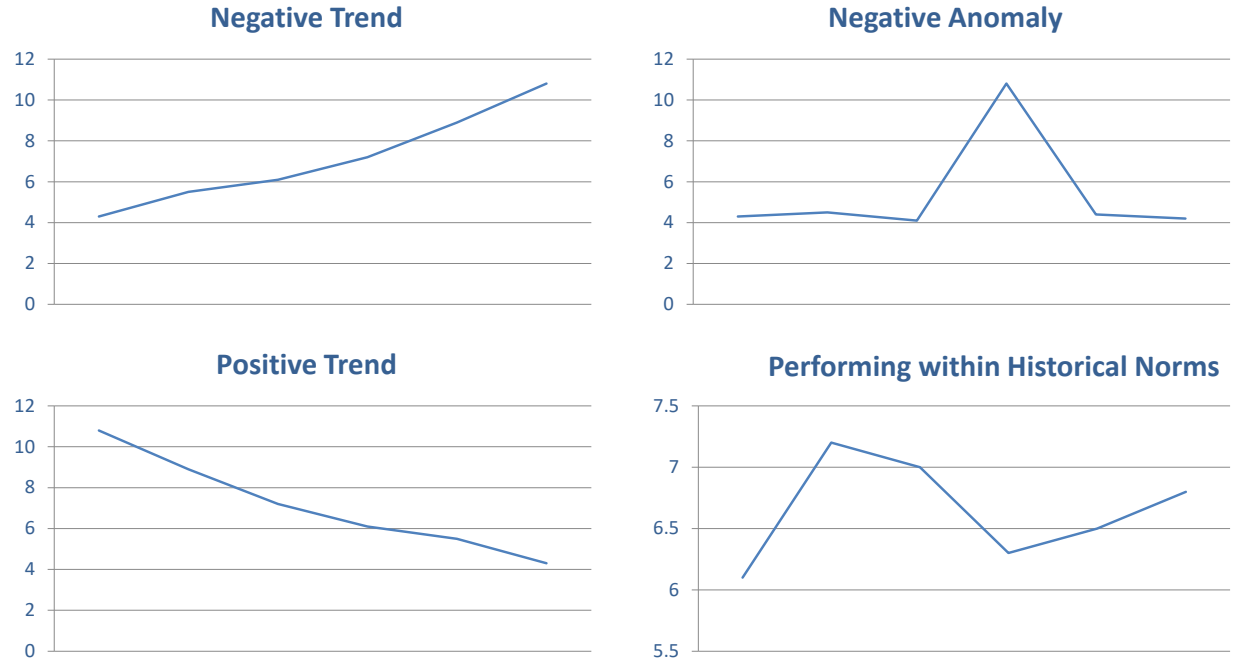
Use of the Logistics Response Time Metric

This metric quantifies the time that requisitioning customers must wait to receive the materiel they order. It is the wholesale order fulfillment time for customer orders not filled at the retail level. It is also the transaction time for requisitions replenishing retail inventory levels (called the order and shipping time).

LRT includes backorder time, which is not included in the TDD compliance metric. LRT also includes all orders placed on the wholesale echelon of supply, apart from initial outfitting orders.

The notional graphs in Figure 24 illustrate the general conclusions that can be made from plotting LRT over time. Increasing times are negative, in that they show greater delays when providing requisitioned materiel. Decreasing times are positive, in that they show a reduction in delays. A one-time spike or jumps in times is a negative anomaly that are researched to identify a cause.

Figure 24. Assessments from LRT Graphs



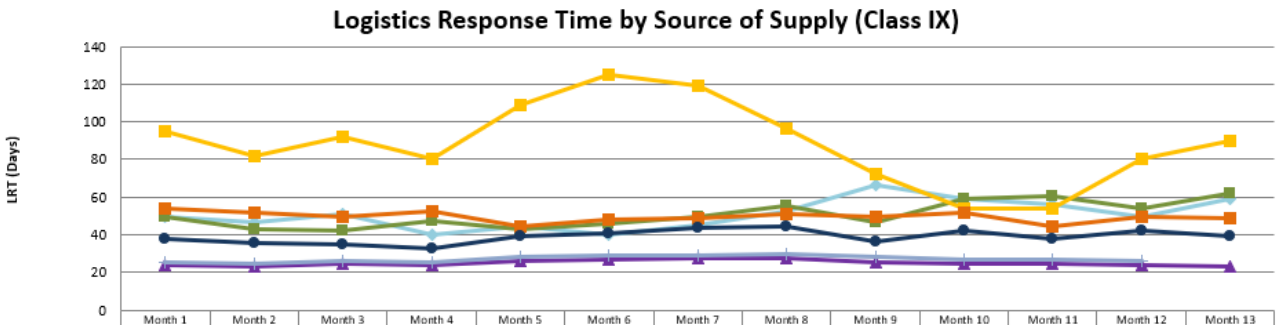
Development of the Logistics Response Time Metric

Supported Supply Chain Strategic Objective	Sustain weapon system materiel readiness.
Attribute	**Responsiveness:** This metric is associated with supply chain responsiveness and includes CWT_{OM} measurements for weapon system end-use orders filled at the wholesale echelon of supply. Timely receipt of materiel demanded from wholesale sources of supply by retail activities and end-users reduces backorders and backorder times at those retail activities.
External or Internal	**Internal:** Based on transaction data collected from the Logistics Metrics Analysis Reporting System (LMARS), this metric quantifies the speed at which requisitions placed on wholesale materiel managers pass through the order and delivery process.

Description of the Logistics Response Time Metric

Definition	A measurement of the mean elapsed time between generation of a requisition (i.e., requisition serial date) and receipt of materiel (i.e., date receipt posted to stock record or property account or equivalent). Initial outfitting orders are excluded from this metric.
Business Value	Indicates how timely the wholesale echelons of supply and distribution systems are in responding to their customers. Represents the results of DoD supply chain efforts to deliver materiel to retail activities in accordance with the Department's negotiated TDD standards.
Goals and Trend Analysis	**Goals:** LRT measurements include backorder time. If backorder time is removed, TDD standards can be used as goals for LRT. **Trend:** LRT is a function of the geographical location of the customer and the transportation used to ship materiel to the customer. Downward trend in LRT is positive; an upward trend is negative.
Computation	The measurement of LRT is from the date the requisition is generated and passed to the designated source of supply until the date the requisitioned materiel is received and posted in the requisitioner's materiel management system. The LRT metric is the average time associated with completed orders in a month. (Initial outfitting orders are excluded from this metric.)
OSD Data Requirements	**Frequency:** Monthly from Defense Automatic Addressing System (DAAS) Content: Individual LMARS records for each requisition placed on wholesale sources of supply.
General Display	Total pipeline times, which are equivalent to the average LRT for a month, and individual pipeline segment times, which are monthly averages, by source of supply, Combatant Command (COCOM), and priority group Figure 25 shows the general display of LRT by source of supply.

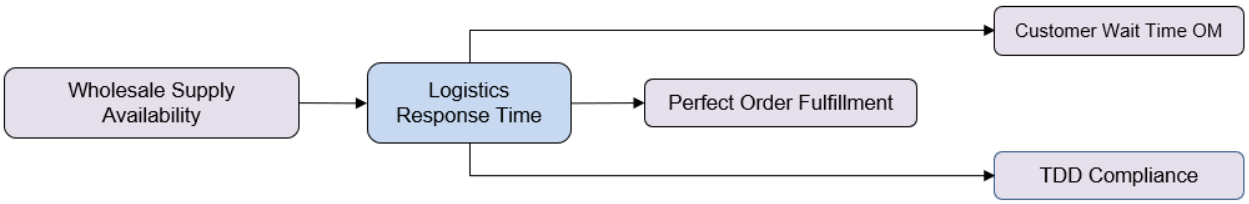
Figure 25. General Display for Logistics Response Time



	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13
Air Force	50	47	51	40	44	40	45	53	66	59	56	50	59
Army	49	43	42	47	43	46	50	56	47	59	61	54	62
DLA	24	23	25	24	26	27	27	28	25	25	24	24	23
Marine Corps	95	82	92	81	109	125	119	96	73	54	54	80	90
GSA	54	52	50	53	44	48	49	51	49	52	44	50	49
Navy	38	36	35	33	39	40	44	45	37	42	38	42	39
DOD	26	24	26	25	28	29	29	30	28	27	27	26	

Relationship of the Logistics Response Time Metric to Other Metrics

Key Relationships:



Wholesale Supply Availability	Measures the effectiveness of the wholesale echelon in filling all requisitions. As wholesale supply availability increases, LRT should decrease because more requisitions are filled immediately with off-the-shelf stocks (i.e., fewer backorders and less backorder time)
Perfect Order Fulfillment	Measures the reliability of the DoD supply chain regarding requisitions on the wholesale echelon. Besides looking at the right quantity, right item, right condition, and right quality, it considers right time by determining if the requisition's LRT meets the appropriate operational needs goal (ONG).
Customer Wait Time OM	Measures the overall speed of the DoD supply chain in responding to orders associated with weapon system maintenance and includes LRT for end-use requisitions. It also depends on the timely fulfillment of resupply requisitions as measured by LRT.
TDD Compliance	Determines if the times for requisitions being fulfilled through the DoD supply chain are meeting TDD standards. Those times are the requisitions' LRT less any time the requisitioned materiel was on backorder. Therefore, the times used to determine TDD compliance differ from LRT when requisitions are backordered.

Reliability Metrics

Description

Definition of Reliability as a DoD Supply Chain Attribute

The dependability and consistency of the supply chain providers in the delivery of required materiel support at a time and destination specified by the customer.

Assessment Objective for Attribute

Determine if the supply chain responds to its customers' demands in a consistent manner and sustains or improves customer confidence in the supply chain and materiel support to weapon system readiness.

Attribute Metrics

Outcome Metric:	Time Definite Delivery (TDD) Compliance Quantifies the result of efforts of DoD supply chain providers to fill requisitions and deliver materiel in a timely manner.
Diagnostic Metrics:	Wholesale Perfect Order Fulfillment Deliveries that are not perfect adversely affect customer confidence in the supply chain's ability to deliver the right materiel at the right time with the right quantity, quality, and documentation. This metric is an addition to TDD compliance and addresses other conditions of order fulfillment in addition to timeliness.
	Wholesale Supply Availability Although backorder time is excluded from TDD compliance, requisitions not filled immediately by the wholesale echelon affect the time retail supply activities must wait for requisitioned materiel. This metric quantifies the percentage of time a requisition is not backordered.
	Materiel Denial Rates If a materiel manager directs a distribution depot to release stock to fill a customer requisition and the response is a materiel denial, the subsequent delay in filling that order can affect the time a retail supply activity must wait for requisitioned materiel. This metric measures the percentage of time a release order is denied.

Time Definite Delivery (TDD) Compliance

Use of the TDD Compliance Metric

This metric evaluates how well the DoD supply chain is meeting the delivery standards which were set by DoD supply chain providers. The standards address source, supplier, transporter, and theater segments of the supply chain (refer to).

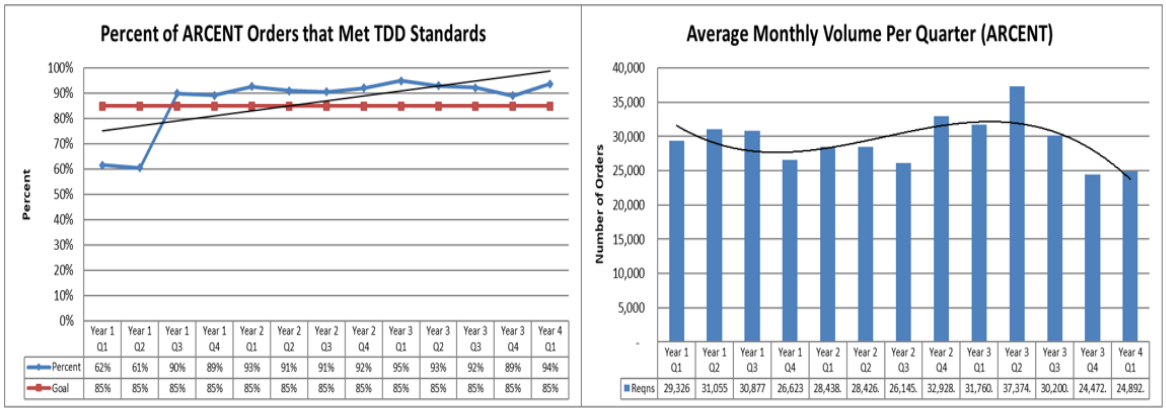
Standards vary by customer location and the priority the customer assigns to requisitions, but the goal is for the total time between initiation of an order and delivery of materiel to be within the standard 85% of the time (without considering backorder time).

The graphs in Figure 26 lead to general conclusions that can be made from plotting TDD compliance over time. The chart on the left illustrates performance against the goal, which in this case is slightly below goal. The chart on the right reflects how the number of shipments included in the percentage of compliance is changing. The

combination of both graphs provides a comprehensive picture of how shipments are being delivered against delivery standards.

Figure 26. Assessments from TDD Compliance Graphs

Development of the TDD Compliance Metric



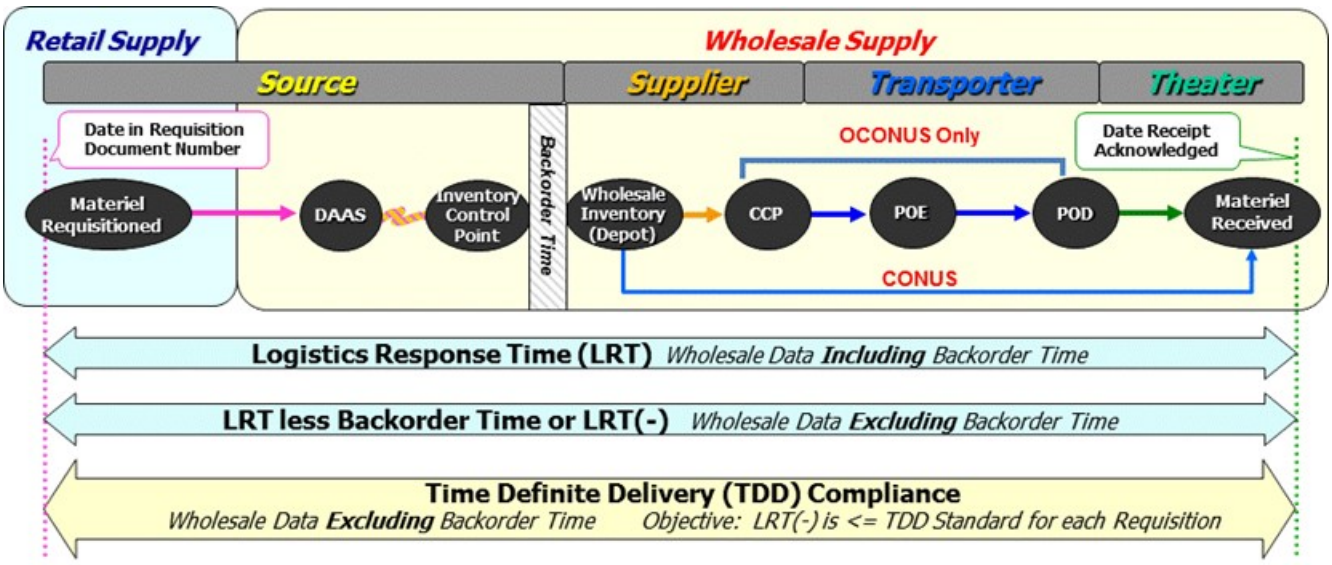
Supported Supply Chain Strategic Objective	Accurately support customer materiel needs.
Attribute	**Reliability**: Quantifies the reliability of the DoD supply chain in meeting TDD standards for requisitions placed on the wholesale echelon of supply. The DoD TDD standards provide delivery performance targets by COCOM, region within COCOM, and transportation mode, as dictated by the customer's priority.
External or Internal	**Internal:** Collected by the U.S. Transportation Command (USTRANSCOM).

Description of the TDD Compliance Metric

Definition	Within a specified degree of probability, the logistics system can deliver required materiel to the customer within a given period. As a metric, TDD compliance measures the count and percentage of shipments that meet the TDD standards for a given COCOM and transportation mode. For this metric, backorder time is excluded (see).
Business Value	This metric quantifies the reliability of the DoD supply chain in meeting negotiated delivery times for responding to customer requisitions.
Goals and Trend Analysis	**Goal**: 85% of deliveries meet their TDD standard. **Trend**: A downward trend in TDD compliance is negative; an upward trend is positive.
Computation	Computed as the percentage of requisitions that meet their TDD standard over the total number of requisitions. USTRANSCOM sets rules on what requisitions are included in its computations—primarily (but not limited to) Class IX and Class II items. **Frequency**: Quarterly submission from USTRANSCOM

OSD Data Requirements	**Content**: The following Distribution Process Owner Joint Deployment • The percentage of global, CONUS, and COCOM shipments that meet TDD standards • The number of global, CONUS, and COCOM shipments.
General Display	*Global, Army Central Command, and Marine Corps Forces Central Command dashboards, with additional statistical displays.* shows the general display of assessments from global TDD compliance.

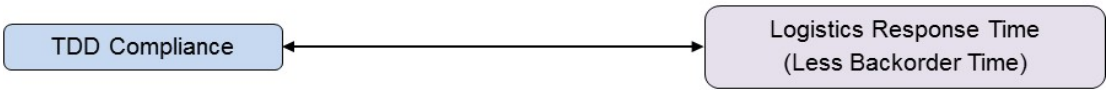
Figure 27. Assessments from TDD Compliance Graphs



Notes: (1) The data source for LRT data is the Logistics Metrics Analysis Reporting System (LMARS) maintained by DLA Transaction Services.
(2) Requisitions that are routed through the Defense Automatic Addressing System (DAAS) are (a) end user customer demands not filled by retail supply and (b) orders to replenish retail stocks.
(3) An inventory control point (ICP) can be (a) organic for items stocked and managed by a DoD Component or (b) commercial for items stocked and managed by a vendor under a planned direct vendor delivery agreement where the requisition goes directly to the vendor or through a Component ICP to the vendor.

Relationship with Other Metrics

Key Relationship:



Logistics Response Time [Less Backorder Time]	Measures the speed of the wholesale echelon in delivering requisitioned materiel. The version of LRT used for TDD compliance excludes the time that requisitions are on backorder. TDD compliance determines if speed of those deliveries is fast enough to meet the negotiated delivery standards. illustrates the relationship between TDD compliance, LRT, and LRT less backorder time (also referred to as LRT [−]).

Wholesale Perfect Order Fulfillment

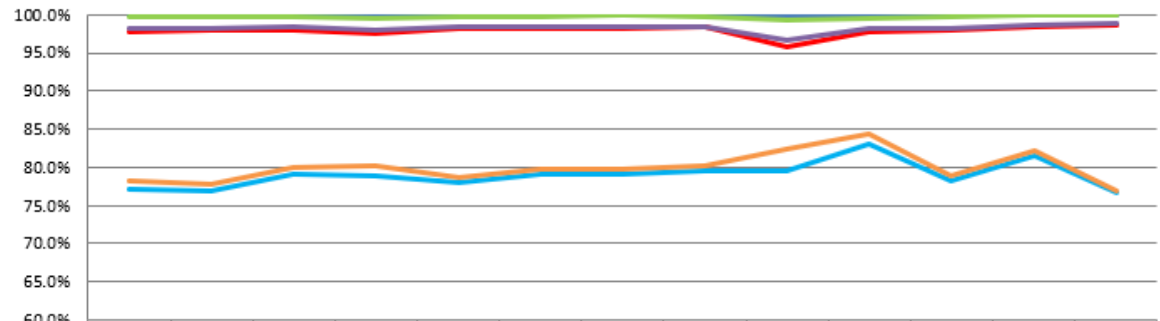
Use of the Wholesale Perfect Order Fulfillment Metric

This metric evaluates the performance of wholesale supply in satisfying customer demand on time with the right quantity, sufficient quality, and proper documentation. Within the military services, discrepancies involving quantity, quality, and documentation are handled on an individual transaction level and not aggregated. At the OSD level, this metric provides aggregate measures of those discrepancies.

An additional view of the metric, Wholesale Perfect Order Fulfillment Minus Time (WPOF (-)), includes only the quantity, quality, and documentation components in its calculation. Displaying both emphasizes the differences between looking at WPOF(-)'s view of orders without considering backorders with POF's inclusion of backorders. The former shows a provider or distribution perspective, while the latter shows a customer or supply chain perspective.

The graph of Figure 28 illustrates that on-time delivery is, and has been, the major driver of perfect order fulfillment (POF). The difference between POF and on-time delivery are discrepancies in quantity, quality, and documentation (primarily quantity). WPOF (-) includes only the quantity, quality, and documentation components.

Figure 28. DoD Perfect Order Fulfillment



	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13
Perfect	77.0%	76.9%	79.1%	78.9%	78.0%	79.0%	79.10%	79.50%	79.50%	83.10%	78.20%	81.50%	76.60%
WPOF(-)	97.7%	97.9%	98.0%	97.6%	98.1%	98.1%	98.20%	98.30%	95.70%	97.70%	98.00%	98.50%	98.70%
On Time	78.1%	77.8%	80.0%	80.1%	78.6%	79.7%	79.70%	80.20%	82.40%	84.30%	78.90%	82.10%	76.90%
Quality	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.00%	100.00%	99.90%	100.00%	100.00%	100.00%	100.00%
Quantity	98.1%	98.2%	98.3%	98.0%	98.3%	98.3%	98.40%	98.50%	96.60%	98.10%	98.20%	98.60%	98.80%
Documentation	99.7%	99.8%	99.7%	99.6%	99.8%	99.8%	99.90%	99.80%	99.20%	99.60%	99.80%	99.90%	100.00%

Development the Wholesale Perfect Order Fulfillment Metric

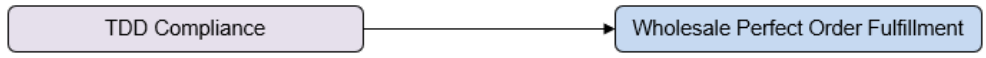
Supported Supply Chain Strategic Objective	Accurately forecast customer materiel needs.
Attribute	**Reliability:** Timely receipt of the correct quantity as ordered in the right condition with the proper documentation is a key indicator of reliable supply chain performance.
External or Internal	**Internal:** Transaction data collected from LMARS tracks the fulfillment of requisitions placed on the DoD wholesale echelon of supply. LMARS is the official DoD system for tracking and collecting data on requisitions from their initial generation until the requisitioned material is received by the requisitioner.

Description of the Wholesale Perfect Order Fulfillment Metric

Definition	The percentage of orders delivered on time with the correct quantity, in the right condition, and with proper documentation.
Business Value	Indicates, based on timeliness and quality criteria, how well the DoD wholesale supply, order management, and distribution systems are performing together to provide materiel to customers. The military services and DLA do not need to collect this metric because they (1) track timeliness and quality issues separately and (2) capture quality issues at the individual order level, not the aggregate level. Wholesale POF captures quality at the aggregate level.
Goals and Trend Analysis	**Goal:** No goal for this DoD-wide metric. **Trend:** A downward trend in wholesale POF is negative; an upward trend is positive.
Computation	Use agreed upon operational need goals and LMARS materiel acknowledgement receipt discrepancy coding to determine if an order is perfect. See Executive Summary on page iii for the rules used to make that determination.
OSD Data Requirements	**Frequency:** Monthly from Defense Automatic Addressing System (DAAS) **Content:** Individual LMARS records for each requisition placed on wholesale sources of supply, including any MRA discrepancy code for the requisition.
General Display	WPOF and its contributors: percentages of on-time fill, right quantity, sufficient quality, and proper documentation are displayed over time. WPOF (-) is the product of the three non-time component percentages—right quantity percentage, sufficient quality percentage, and proper documentation percentage. Separate displays are available for all classes of supply and Class IX items. Currently, two other versions of WPOF are displayed. See Executive Summary on page iiI for their description. Figure 28 shows the general display for WPOF.

Relationship to Other Metrics

Key Relationships:



TDD Compliance	Evaluates delivery time against on-time performance. Although POF is derived from on-time performance, right quantity, sufficient quality, and proper documentation, the driver for POF measurements is on-time performance.

Note 1: Rules for determining if an order is perfect

Perfect

An order is perfect if it is delivered on-time with the right quantity, in sufficient quality, and with proper documentation. A failure of any one of these four conditions is a POF failure for that order.

While meeting a time standard or a customer date is the basis for the on-time condition, the LMARS MRA discrepancy code on an order is the basis for the other conditions. Codes are not always complete or accurate, and the Department is developing systems to improve the reporting on several conditions. Once the new sources are developed fully and the issues relative to the complete codes are resolved, the designation of a perfect order should improve.

On-Time

A delivery is on time if its LRT (i.e., the total time to complete the order from initiation to delivery) is within the applicable operational needs goal for that order. Goals are based on the region within the customer's COCOM, Service, and the priority the customer places on the order.

Right Quantity

A delivery has the correct quantity if its MRA discrepancy code is not "F".

"F" indicates a shortage or partial or total non-receipt.

Sufficient Quality

A delivery has sufficient quality if its MRA discrepancy code is not "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 qualifying criteria for discrepancy report submission.

Proper Documentation

A delivery has the proper documentation if its MRA discrepancy code is not "B".

"B" indicates there is no record of requisition.

Wholesale Supply Availability

Use of the Wholesale Supply Availability Metric

This metric evaluates the range and depth rules of DoD wholesale materiel managers; that is, ensuring they are stocking the right items in the right quantities.

If stock is not readily available to fill the quantity on a customer requisition, the requisition is backordered. A backorder, whether eventually filled by an incoming procurement, expedited repair, an unplanned DVD, or a lateral distribution action, reduces service to the customer by adding additional time to complete the fill action. If stock is on the shelf to fill the demand, then no time on backorder is added to the demand's LRT.

For an individual requisition, either sufficient stock is on the shelf to fill it or there is insufficient stock to fill all or part of the order quantity. However, because wholesale supply availability is an aggregate across all requisitions, it is a percentage between zero (all requisitions are backordered) and 100 (no requisitions are backordered).

The notional graph in Figure 29 illustrates the wholesale supply availability plot over time. It includes two counts—demands and backorders—that are used to compute the wholesale availability percentage. If backorders increase and demand remains constant or decreases, availability will decline. If backorders remain constant or decline and demand increases, availability will increase. If both demand and backorders increase or decline, the behavior of availability will depend on whether demand or backorders has the bigger change.

Figure 29. Information Shown on Wholesale Supply Availability Graph

Development of the Wholesale Supply Availability Metric

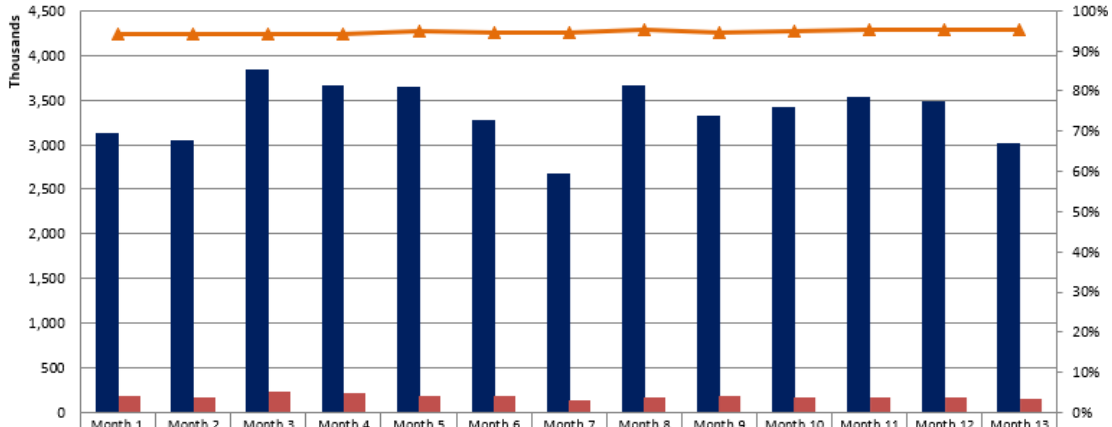
Supported Supply Chain Strategic Objective	Accurately support customer materiel needs.
Attribute	**Reliability:** Backordering a requisition can add significant time to the normal time it takes the DoD supply chain to satisfy a customer's requisition. Therefore, the percentage of time a requisition is not placed on backorder is a key measure of the supply system's reliability in fulfilling customer orders
External or Internal	**Internal:** This metric is compiled by wholesale materiel managers as a measure of how often they have the stock needed to immediately fill demands.

Description of the Wholesale Supply Availability Metric

Definition	The percentage of demands placed on the wholesale echelon of supply that are not backordered, excluding future material obligations. Supply availability is synonymous with supply materiel availability.
Business Value	Serves as an indicator of wholesale inventory management's ability to plan and execute in a synchronous manner. Reflects the ability of wholesale materiel managers to respond to changes in customer demand and funding.
Goals and Trend Analysis	**Goals:**

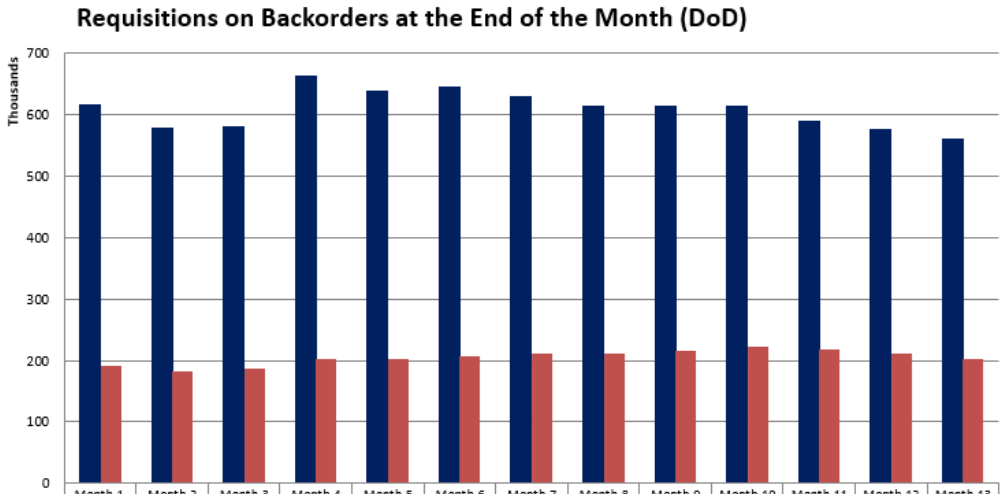
	• Army—85% overall and 90% for NMC orders for stock availability metric (similar to supply availability) • Navy—85% • The Air Force employs readiness-based sparing, which has differing goals for each model and design aircraft. • Marine Corps—85% • DLA—varies by commodity and performance-based agreement **Trend:** An upward trend is positive; a downward trend is negative.
Computation	100% – the backorder rate which is backordered demand ÷ total wholesale demand. This computation can be made for all the military services and DLA wholesale materiel managers, it is an OSD computation, because this metric is not computed by some of the military services.
OSD Data Requirements	**Frequency:** Monthly **Content:** Components submit the following demand and backorder data: • The number of demands placed on a military service and DLA • The number of demands placed on a military service and DLA that were backordered • The number of on-hand backorders at the end of the month • The number of on-hand backorders at the end of the month that are 180 days or older. The identification of what is a backorder based on status code (i.e., BB, BC, BD, BP, BV, and BZ) is determined by the component. Definitions for applicable codes are given below.
General Display	Supply availability as a percentage, the number of total demands and the number of backordered demands Figure 30 shows the general display for wholesale supply availability, including the total demands and backordered demands. Figure 31 shows the display number of backorders at the end of the period and the number of backorders older than 180 days at the end of the period.

Figure 30. General Display for Wholesale Supply Availability



	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13
Demand	3,114,972	3,042,165	3,829,077	3,654,920	3,638,556	3,271,637	2,667,755	3,649,591	3,308,689	3,409,657	3,528,914	3,479,532	3,012,682
New Backorders	184,764	176,212	228,137	215,365	182,396	181,075	142,889	170,807	183,912	171,724	171,129	170,392	145,233
Fill Rate	94%	94%	94%	94%	95%	94%	95%	95%	94%	95%	95%	95%	95%

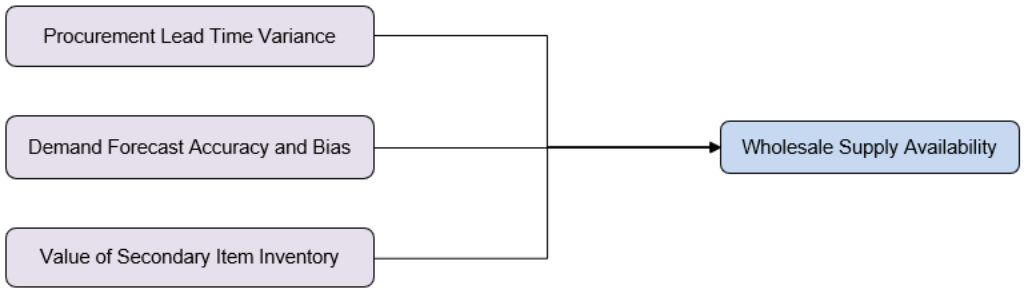
Figure 31. Display for On-Hand Backorders



	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13
Cumulative Backorders End of Period	614,677	577,218	578,845	661,638	638,353	643,013	628,242	612,710	613,524	613,333	588,999	575,128	559,340
Backorders > 180 Days	192,132	181,496	185,946	201,454	202,802	206,743	211,835	212,250	216,074	222,202	217,133	211,461	202,440

Relationships with Other Metrics

Key Relationships:



Procurement Lead Time Variance	Quantifies if suppliers are delivering materiel to the DoD supply chain as predicted. If the variance indicates a high degree of late deliveries, this could cause backordered demands to increase. If the variance indicates a high degree of early deliveries, this could cause backordered demands to decrease. Repair is the primary source of replenishment for DLR items, while procurement is the source for replenishing condemnations and new requirements. Repair cycle time is the lead time for repair. In the same way that procurement lead time affects wholesale supply availability, variance in repair cycle time affects wholesale supply availability.
Demand Forecast Accuracy and Bias	Quantifies the ability of the DoD supply chain to predict the needs of its customers. If the demand forecast accuracy and bias metrics show that the DoD supply chain is over-forecasting customer requirements, inventory requirements levels should cover a larger portion of customer demand than expected, thereby contributing to a higher wholesale supply availability than expected. If the demand forecast accuracy and bias metrics show the DoD supply chain is under-forecasting customer requirements, inventory requirements levels should cover a smaller portion of customer demand than expected, thereby contributing to a lower wholesale supply availability than expected.
Value of Secondary Item Inventory	A demand is normally not backordered if there is stock available to be issued from inventory to fill the demand quantity. If materiel managers are holding more inventory to meet demand while the level of demand is not increasing, then there should be more inventory available to fill demand and avoid backorders. The same is true if demand decreases and inventory remains stable.
Demands	The total number of demands placed on the wholesale echelon of supply.
Backordered Demands	The total number of demands that are backordered.

Definitions for Backorder Status Codes

The following requisition transaction status codes are associated with backorders:

- BB – Item is backordered against a due-in to stock.
- BC – Item on original requisition containing this document number has been backordered.
- BD – Requisition is delayed because of need to verify requirements relative to authorized application, item identification, or technical data.
- BP – Requisition has been deferred per customer instructions.
- BV – Item procured and on contract for direct shipment to consignee.
- BZ – Requisition is being processed for direct delivery procurement.

BV and BZ status codes indicate the requisition will be filled by an unplanned DVD (versus an immediate issue from stock).

Materiel Denial Rates

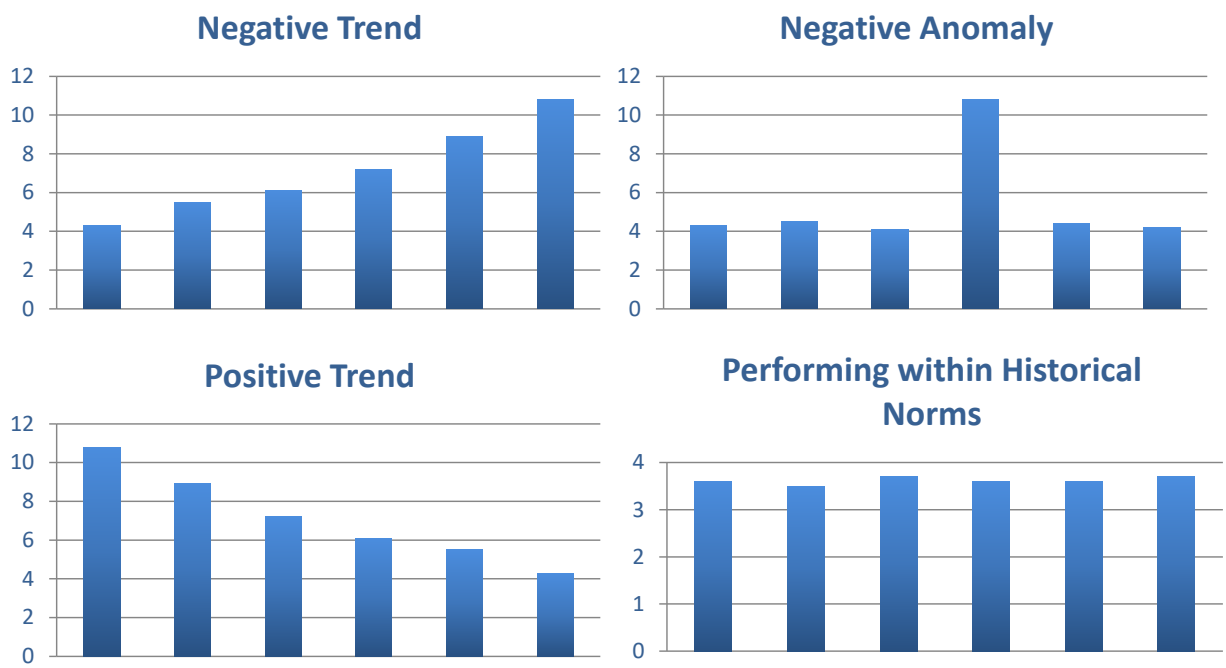
Use of the Materiel Denial Rates Metric

Materiel denial rates evaluate the accuracy of depot storage records for requisitioned materiel. If a wholesale materiel manager issues a materiel release order to a depot to pick, pack, and ship an order to fill a requisition, a materiel denial occurs when the depot cannot locate the stock[5] needed to ship the full quantity on the materiel release order. Upon receiving a materiel denial, the wholesale manager may issue from an alternative depot or backorder the demand.

Because this metric is focused on requisitioned materiel, it will not capture inaccuracies in account records for items that are not requisitioned.

The notional graphs Figure 32 illustrate the general conclusions that can be made from plotting materiel denial rates over time. An increase in the rate indicates that more warehouse denials are occurring, which is a degradation in performance.

Figure 32. Assessment from Materiel Denial Rate Graphs



Development of the Materiel Denial Rates Metric

Supported Supply Chain Strategic Objective	Effectively and efficiently manage materiel.

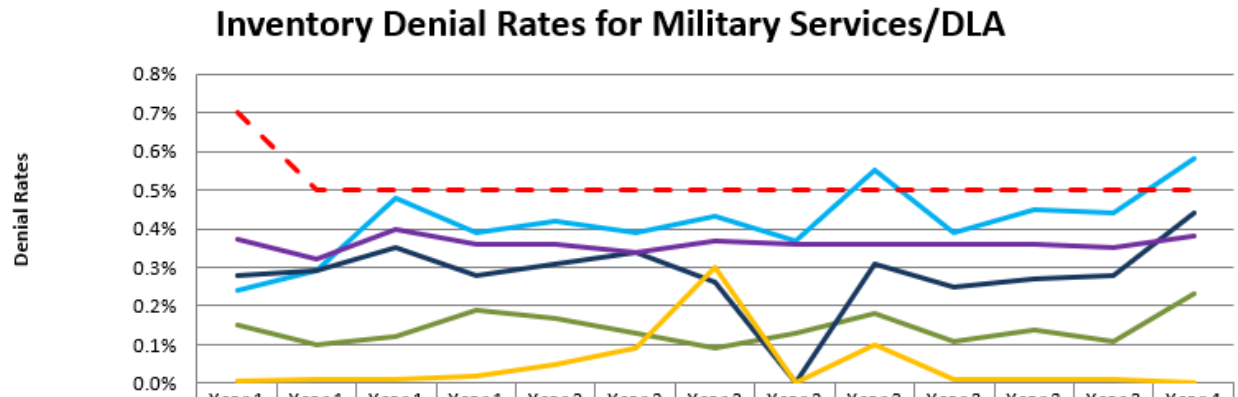
[5] This happens when the depot's accountable record for the ordered materiel is incorrect.

Attribute	**Reliability:** Knowing the stock locations and quantities for items in storage is important for maintaining asset visibility and accountability. It is also essential for pulling stock from storage to fill customer orders, as materiel denials lead to backorders when stock cannot be located. Backorders resulting from materiel denials will add to the normal time to respond to a customer's requisitions and degrade the reliability of the supply system.
External or Internal	**Internal:** This metric is collected as part of the Inventory Control Effectiveness (ICE) report produced by DLA Distribution.

Description of the Materiel Denial Rates Metric

Definition	The percentage of line items intended for shipment that distribution depots did not ship either partially or at all. This metric is not collected for retail storage activities.
Business Value	Measures the reliability of asset accountability systems at defense distribution depots. Quantifies how accountability systems match physical assets (book to floor). Serves as an indicator of the accuracy of inventory storage location records and the impact of inaccuracy on issue of materiel to customers.
Goals and Trend Analysis	**Goals:** Current goal is 0.5% **Trend:** A downward trend in materiel denial rates is positive; an upward trend is negative.
Computation	In accordance with DLM 4000.25, Volume 2, the materiel denial rate is the number of shipments for which all or part of the quantity failed to be shipped, divided by the total number of demands received.
OSD Data Requirements	**Frequency:** Quarterly **Content:** Denial rates by issuing service and DLA, which are collected from ICE reports that DLA Distribution provides to DASD (Logistics). (report control symbol DD-AT&L [Q] 935).
General Display	Denial rate as a fraction of a percentage and number of denials by DoD Component. Figure 33 shows the general display for materiel denial rate.

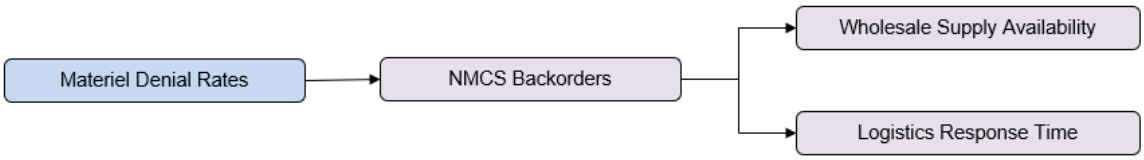
Figure 33. General Display for Materiel Denial Rate



	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4	Year 4 Q1
Air Force	0.2%	0.3%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.6%	0.4%	0.5%	0.4%	0.6%
Army	0.1%	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.2%
Navy	0.3%	0.3%	0.4%	0.3%	0.3%	0.3%	0.3%	0.0%	0.3%	0.3%	0.3%	0.3%	0.4%
Marine Corps	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
DLA	0.4%	0.3%	0.4%	0.4%	0.4%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Goal	0.7%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%

Relationships with Other Metrics

Key Relationships:



Wholesale Supply Availability	A materiel denial at a storage location could result in a backordered demand, which would lower wholesale supply availability.
Logistics Response Time	A materiel denial delays depot processing time as well as ICP processing time, both of which are sub-segments of LRT.
NMCS Backorder	A materiel denial on a materiel release order for a NMCS demand results in a NMCS backorder.

Cost Metrics

Description

Definition of Cost as a DoD Supply Chain Attribute

The value of supply chain resources required to deliver a specific performance outcome.

Assessment Objective for Attribute

Determine if the supply chain is providing cost-effective support to its customers and managing inventory in a cost-effective manner.

Attribute Metrics

Outcome Metrics:	Logistics Cost Baseline Tracks the efforts of the DoD supply chain to control its costs by measuring how much DoD operating forces pay for logistics support.
	Value of Secondary Item Inventory Quantifies the Department's inventory investment that results from the inventory management efforts of military service and DLA materiel managers.
Diagnostic Metrics:	Inventory Segmentation of No Demand Items Quantifies the portion of the total inventory investment tied up in items that have experienced no demand in 5 or more years. Can be used to analyze inventory growth or the effectiveness of inventory level setting rules.
	Tiered Inventory Turns Computes an inventory turn for DoD inventories that are purchased or repaired based on forecastable sales.
	Supply Chain Management Costs Quantifies the working capital fund (WCF) overhead costs that are attributable to supply chain management and how they compare to materiel obligations.
	Supply Management Cost Changes Quantifies the changes in overhead and materiel acquisition costs from one year to the next year.

Logistics Cost Baseline

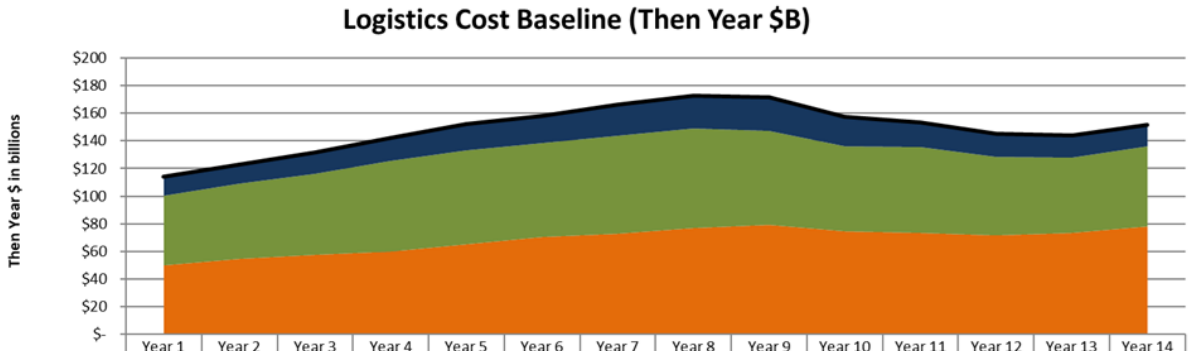
Use of the Logistics Cost Baseline Metric

This metric quantifies the cost of logistics based on dollars that warfighters pay. Since costs incurred by supply chain providers and materiel costs are part of logistics costs, any increase passes to the customer.

Figure 34 shows how the logistics cost baseline (also known as the log cost baseline) metric tracks annual transportation, supply, and maintenance costs over time. During the period of wartime operations, costs climbed. When forces started to withdraw, costs began to decline. Maintenance costs have the slowest rate of decline, as returning equipment must be repaired.

Logistics Cost Baseline reflects a different inventory value than the inventory provided in the Supply System Inventory Report (SSIR). Logistics Cost Baseline does not include fuel and in-transit stocks nor does it devalue anticipated condemnations and potential reutilization stocks to their disposal.

Figure 34. Information Shown on Logistics Cost Baseline Graph



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Transportation	$13.6	$13.8	$15.7	$17.0	$19.1	$19.7	$22.4	$23.6	$24.2	$21.7	$18.2	$16.6	$16.5	$15.2
Supply	$50.3	$54.3	$58.5	$65.3	$67.8	$68.0	$71.3	$72.1	$67.6	$61.0	$62.1	$56.9	$54.3	$58.2
Maintenance	$49.9	$54.7	$57.4	$60.1	$65.1	$70.2	$72.6	$76.8	$79.5	$74.8	$73.3	$71.6	$73.4	$78.0
Total LCB	$113.9	$122.8	$131.7	$142.4	$152.0	$157.8	$166.3	$172.4	$171.2	$157.6	$153.5	$145.0	$144.2	$151.4

Development of the Logistics Cost Baseline Metric

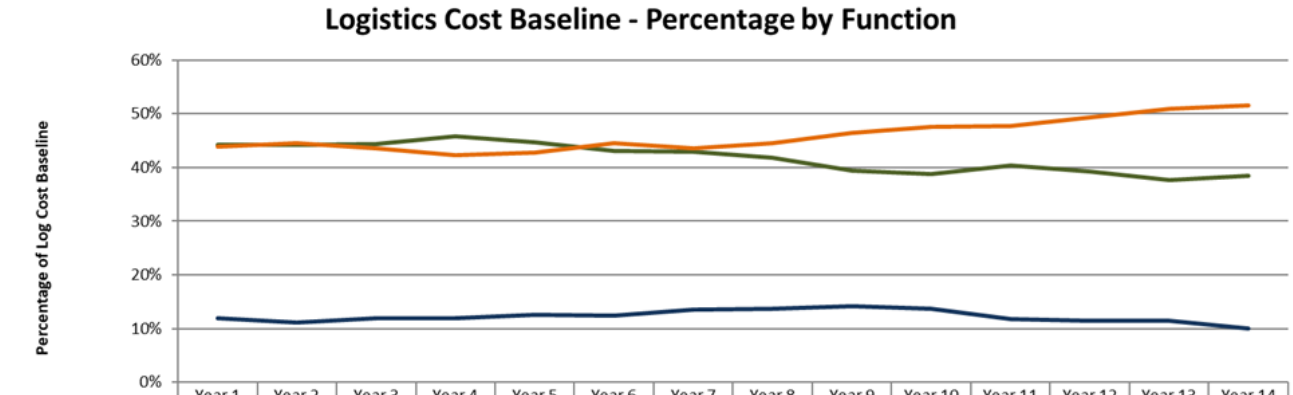
Supported Supply Chain Strategic Objective	Control costs.
Attribute	**Cost:** By measuring how much the customer pays for logistics support, this metric balances supply chain performance against supply chain costs to ensure objectives are achieved as economically as possible.
External or Internal	**External:** Compiled from budget and logistics manpower data.

Description of the Logistics Cost Baseline Metric

Definition	The total operations and maintenance (O&M) and military and civilian personnel costs by the logistics activities that are primarily under the purview of the Assistant Secretary of Defense for Sustainment (ASD[S]): supply, maintenance, and transportation.
Business Value	• Measures the success of supply chain cost control projects by showing the outcome of those projects. • Improves supply chain decision making by enabling the comprehensive evaluation of performance and cost.
Goals and Trend Analysis	**Goals:** Not applicable as this metric exists to support analysis. **Trend:** A downward or upward trend in this metric cannot be evaluated in isolation. For example, an upward trend could be positive if military operations are going up; it may be negative if operations are going down.

Business Rules:	Log cost baseline process (amended in FY2011 to refine some cost estimates) is a compilation of two main components: • Logistics O&M costs from the OP-32 budget documents • Manpower costs for active military, civilian, and reserve logisticians.
OSD Data Requirements	**Frequency:** The log cost baseline process is performed annually when DoD budget documents become available. **Content:** Financial exhibits for O&M costs and data on manpower costs are used to compile the log cost baseline.
General Display	Costs are portrayed by logistics function (i.e., supply, maintenance, and transportation) and as a percentage of the total DoD budget. Figure 34 shows the general display for log cost baseline. Figure 35 shows the general display for maintenance transportation, supply and maintenance costs as a percentage of the total DoD budget.

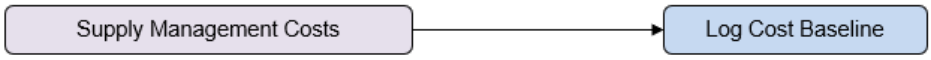
Figure 35. Display of the Logistics Cost Baseline Percentage by Function Graph



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Transportation %	12%	11%	12%	12%	13%	12%	13%	14%	14%	14%	12%	11%	11%	10%
Supply %	44%	44%	44%	46%	45%	43%	43%	42%	39%	39%	40%	39%	38%	38%
Maintenance %	44%	45%	44%	42%	43%	44%	44%	45%	46%	47%	48%	49%	51%	51%

Relationships with Other Metrics

Key Relationships:



Supply Management Costs	Supply management costs are built into the prices military customers pay for logistics services. An increase in supply chain management costs will increase the log cost baseline.

Value of Secondary Item Inventory

Use of the Value of Secondary Item Inventory Metric

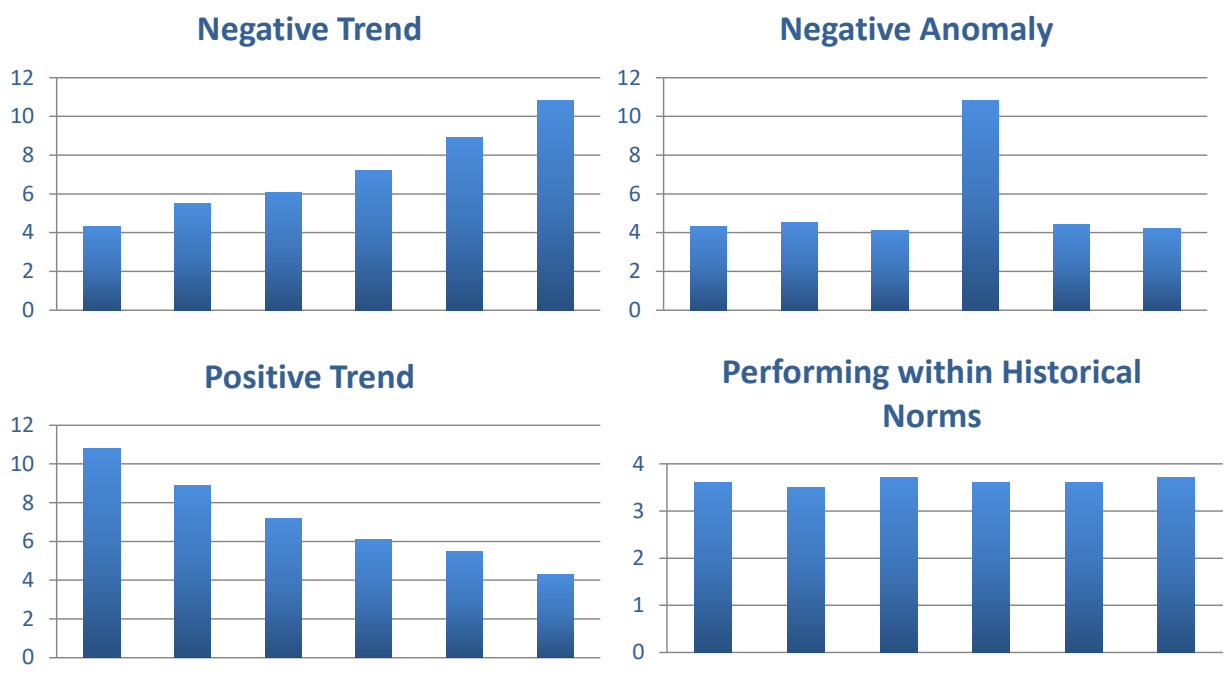
This metric quantifies the value of inventory investment within the DoD supply chain.

Inventory can be valued at different prices, and inventory segments can be included—or excluded—from the "total" value. As a result, alternative values are possible, and the use of these values is tied to how the metric is used. In this case, the value of secondary item inventory metric is used to evaluate the results of inventory management within the Department and the effectiveness of efforts to improve inventory management.

The value of secondary item inventory metric is important when evaluating the Department's efforts to reduce inventory excess to authorized requirements and retention levels. Accordingly, all inventories, including inventory identified as PRS and anticipated condemnations, are valued the same way. PRS and anticipated condemnations are not devalued to their disposal value, because it is in other inventory value metrics (e.g., this differs from the Supply System Inventory Report [SSIR], which accounts for all inventories at their recognized value; for PRS, that value is its disposal value). Fuel inventories are excluded from this metric. In-transit inventory, which is reported in the SSIR, is also excluded, because it is not considered on-hand inventory.

The notional graphs in Figure 36 illustrate the general conclusions that can be made from plotting the value of inventory over time (although several assumptions are required). Specifically, the graphs assume no change in demand or performance to customers. They simply show the value of the inventory satisfying demands at the same supply availability. If more inventory is needed to support the same demand, there may be materiel management inefficiencies. If less inventory is needed, materiel management may be more efficient.

Figure 36. Assessments from Inventory Value Graphs



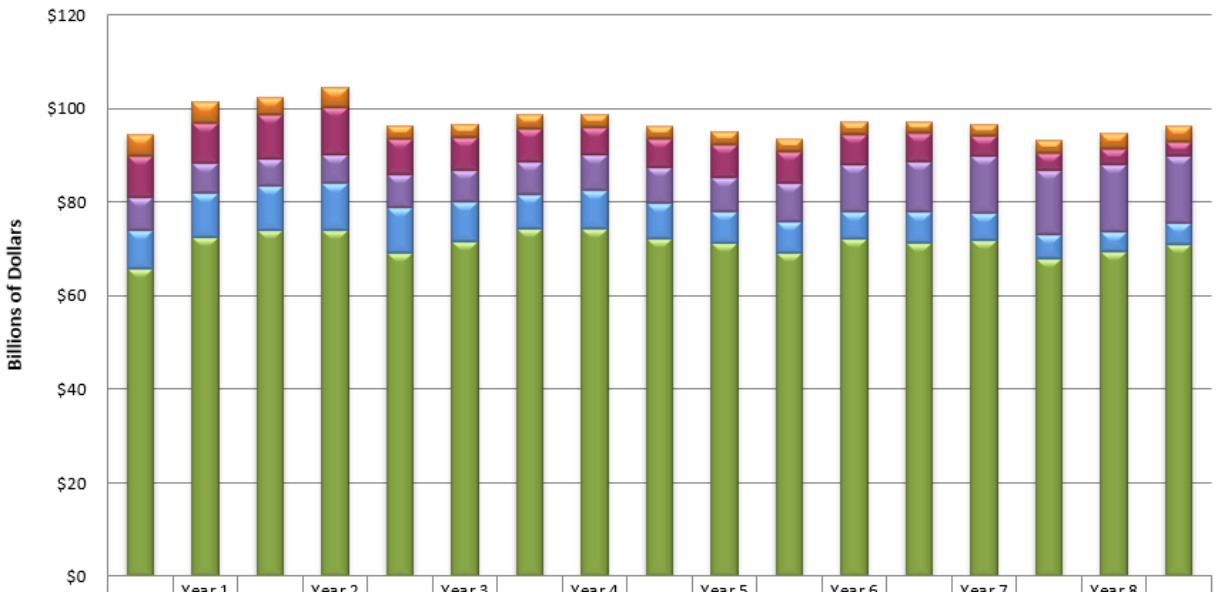
If we remove the assumptions that demand and performance are constant over time, the graphs in Figure 37 may have different interpretations.

- If inventory demand increases or declines, the level of inventory should do the same; however, the change in inventory may lag the change in demand.
- If performance increases while demand remains constant, then inventory may increase, or materiel management may be more effective.
- If performance declines while demand remains constant, then inventory may decline, or materiel management may be less effective.

In short, diagnosing changes in the value of inventory cannot be made in isolation.

One of the most informative aspects of the value of secondary item inventory metric is how it breaks out the major categories of inventory, as shown in Figure 37. Increases or decreases in requirements are reflected in changes within the AAO, while increases or decreases in retention stocks are shown in changes to ERS and CRS. Changes in PRS reflect growth (or a decline) in excess inventory.

Figure 37. Information Shown on Inventory Value Graph



	Year 1	Year 1 Q2	Year 2	Year 2 Q2	Year 3	Year 3 Q2	Year 4	Year 4 Q2	Year 5	Year 5 Q2	Year 6	Year 6 Q2	Year 7	Year 7 Q2	Year 8	Year 8 Q2	Year 9
Ant Cond	$4.6	$4.5	$3.8	$4.2	$3.0	$2.7	$3.0	$2.8	$2.7	$2.7	$2.6	$2.6	$2.2	$2.4	$2.7	$3.2	$3.4
PRS	$8.8	$8.5	$9.5	$10.3	$7.5	$6.9	$7.2	$5.9	$6.1	$6.9	$6.8	$6.7	$6.2	$4.5	$3.8	$3.3	$3.0
CRS	$7.2	$6.4	$5.8	$6.1	$7.1	$7.0	$6.8	$7.5	$7.7	$7.2	$8.2	$10.0	$10.8	$12.1	$13.6	$14.4	$14.3
ERS	$8.0	$9.4	$9.5	$9.9	$9.5	$8.4	$7.4	$8.2	$7.6	$6.9	$6.8	$5.9	$6.5	$5.9	$5.2	$4.3	$4.7
AAO	$65.9	$72.6	$73.9	$74.1	$69.2	$71.6	$74.3	$74.4	$72.1	$71.2	$69.0	$72.1	$71.4	$71.8	$68.0	$69.5	$70.9
Total	$94.5	$101.4	$102.5	$104.6	$96.4	$96.6	$98.8	$98.8	$96.2	$95.0	$93.4	$97.2	$97.1	$96.7	$93.3	$94.7	$96.3

Development of the Value of Secondary Item Inventory Metric

Supported Supply Chain Strategic Objective	Control costs.
Attribute	**Cost:** Quantifies the dollar value of the DoD investment in secondary item inventory, which is the outcome of its efforts to right-size inventory to meet customer demand.
External or Internal	**Internal:** This metric is collected from military service and DLA materiel managers.

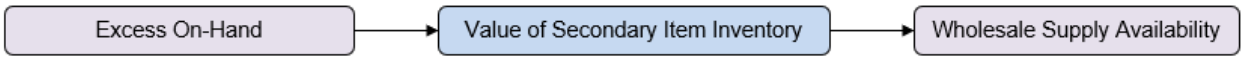
Description of the Value of Secondary Item Inventory Metric

Definition	The dollar value of DoD secondary item inventory (excluding fuels and in-transit stocks) by inventory segment. The segments are anticipated condemnations (not devalued for disposal) and stocks within the AAO, ERS, CRS, and PRS (not devalued for disposal).

Business Value	Serves as an indicator of growth, decrease, or stabilization in the investment in DoD inventory; identifies the segments of inventory that are changing and the degree of excess inventory.
Goals and Trend Analysis	**Goals:** Although no dollar goal exists for this metric, the goals for excess on-hand inventory and validation of retention inventory are related. **Trend:** A downward or upward trend in the value of inventory cannot be evaluated in isolation. For example, an upward trend can be positive if demand is going up; it may be negative if demand is going down.
Computation	This metric is the sum of all secondary item inventories, excluding fuels and in-transit stocks, valued as follows: • Serviceable assets at their moving average cost (MAC) • Unserviceable assets at their MAC, less the cost to repair. (The metric differs from the inventory reported in the SSIR in that (1) anticipated condemnations and PRS are not devalued to their net realizable value and (2) in-transit stocks and fuels are excluded.)
OSD Data Requirements	**Frequency:** Semi-annual submission by military services and DLA—end of September values by February 15; end of March values by August 15. **Content:** The dollar values of inventory segments reported for the SSIR and modified to exclude fuels and SSIR in-transit stocks and to revalue anticipated condemnations and PRS to full value.
General Display	Inventory by SSIR categories (less fuels and in-transit) and displays with AAO and CRS breakouts. Figure 37 shows the general display for the value of secondary item inventory.

Relationships with Other Metrics

Key Relationships:



Excess On-Hand	Quantifies that portion of the DoD investment in secondary item assets that is above the immediate need (AAO), ERS, and CRS. As such, its target is a percentage of the total value of secondary item inventory.
Wholesale Supply Availability	Measures the effectiveness of the wholesale echelon in filling all requisitions. Increasing the amount of assets available to fill requisitions will increase supply availability.

Note on Secondary Items

Reparable components, subsystems and assemblies, consumable repair parts, bulk items and material, and subsistence and expendable end items (including clothing and other personal gear) are all secondary items.

Inventory Segmentation of No Demand Items

Use of the Inventory Segmentation of No Demand Items Metric

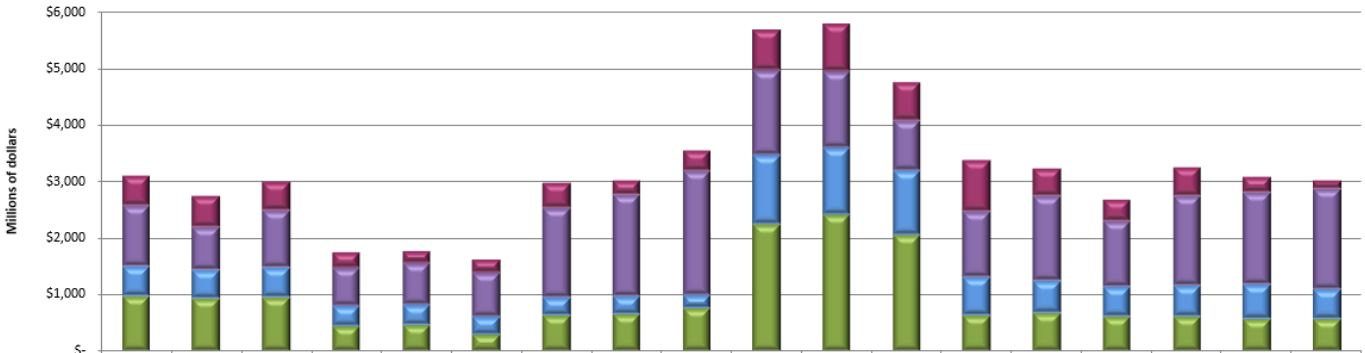
The procedures governing the acquisition and retention of inventory are geared toward having inventory for sale. As a result, inventories with low sales prospects should be minimal, particularly inventory for items with no demand in 10 or more years.

The primary use of this metric is to identify opportunities to improve inventory management processes. By conducting in-depth reviews of items with no demand, materiel managers may identify where

- inventory should not be retained,
- inventory level setting models could be improved to reduce the risk of excess inventory, and
- inventory processes could be improved to avoid (except in the case of insurance items)
  - stocking any items that have no forecasted demand and
  - the probability of future demand is negligible or zero.

The notional chart in Figure 38 does not indicate any particular level of performance. It shows how inventories for items with no demand in 5 to 9 years and 10+plus years are segmented in the major inventory categories of AAO, ERS, CRS, and PRS. This segmentation allows inventory managers to focus on the management procedures associated with no demand item inventories. A decrease in dollars in the 10+ years segment indicates that progress is being made in reducing inventory for items that have low probability of future use.

Figure 38. Information Shown on Graph of Inventory Segmentation of No Demand Items



	5-9 years									10+ years								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
PRS Dollars	$539	$537	$503	$264	$219	$227	$438	$260	$354	$729	$865	$692	$904	$486	$384	$514	$289	$165
CRS Dollars	$1,074	$763	$1,002	$683	$737	$773	$1,586	$1,799	$2,193	$1,499	$1,336	$889	$1,164	$1,503	$1,155	$1,575	$1,627	$1,758
ERS Dollars	$515	$518	$537	$372	$356	$315	$305	$320	$245	$1,220	$1,194	$1,140	$680	$562	$535	$550	$599	$528
AAO Dollars	$974	$921	$944	$429	$462	$302	$639	$641	$750	$2,236	$2,397	$2,034	$622	$674	$610	$608	$572	$574

Development of the Inventory Segmentation of No Demand Items Metric

Supported Supply Chain Strategic Objective	Effectively and efficiently manage materiel.
Attribute	**Cost:** Quantifies the dollar value of the DoD investment in inventory for items that haven't had a demand in 5 or more years. As such, may identify candidates for excess inventory reduction.

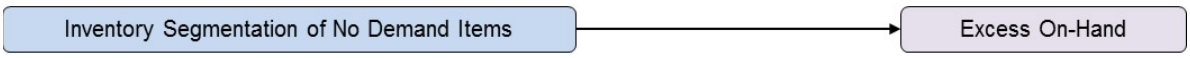
External or Internal	**Internal:** Reported to ODASD (Logistics) by the military services and DLA as part of their semi-annual inventory management reviews.

Description of the Inventory Segmentation of No Demand Items Metric

Definition	Inventory dollars for items with 5 or more years of no demand, further segmented into AAO, ERS, CRS, and PRS.
Business Value	Tracking this metric allows materiel managers to identify where their management procedures may need improvement.
Goals and Trend Analysis	**Goals:** No goal exists for this metric. **Trend:** A downward trend in this metric is positive, while an upward trend is negative.
Computation	Items that have no demand in 5 to 9, or 10+ years are identified by years of no demand. The years-of-no-demand categories are mutually exclusive. The inventory dollars for each item is collected in AAO, ERS, CRS, and PRS buckets by years-of-no-demand category.
OSD Data Requirements	**Frequency**: Components submit twice a year—end of September values by February 15; end of March values by August 15. **Content**: Dollar values of inventory segments (AAO, ERS, CRS, and PRS) for items that have 5 to 9, or 10+ years of no demand.
General Display	Stacked histograms of SSIR segments for each year of no demand for 5 to 9 years and 10+ years. Figure 38 shows the general display for the inventory segmentation of no demand items.

Relationships with Other Metrics

Key Relationship:



Excess On-Hand	Quantifies the portion of the DoD investment in secondary item assets that is above immediate need (AAO), ERS, and CRS. Except for insurance items and items with war reserve requirements, items with no demand should not have • demand-based requirements within the AAO or • ERS. Consequently, assets for such items should stratify as either CRS or excess on-hand.

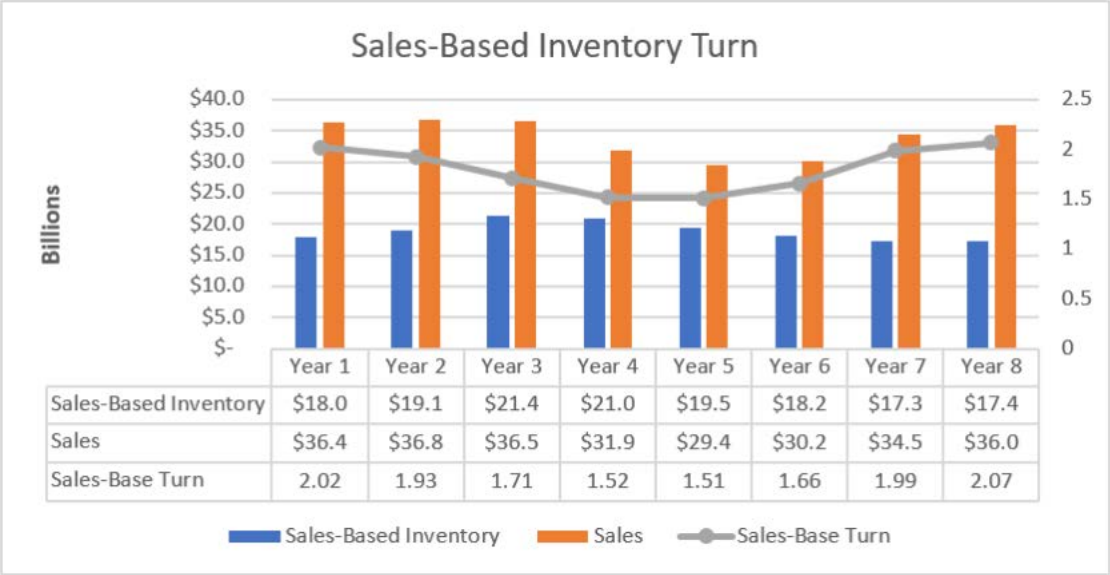
Tiered Inventory Turns

Use of the Tiered Inventory Turns Metric

The term "inventory turn" is normally associated with sales. In developing this metric, consideration has been given to turns for segments of inventory (such as ERS and PRS), for which the turn is not sales related.

A chart on inventory turns can have several interpretations because turns are a function of the value of inventory and sales. Figure 39 shows an initial rate of sales declining faster than inventory levels accompanied by sales increasing faster than inventory levels.

Figure 39. Sales Based Inventory Turn



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Sales-Based Inventory	$18.0	$19.1	$21.4	$21.0	$19.5	$18.2	$17.3	$17.4
Sales	$36.4	$36.8	$36.5	$31.9	$29.4	$30.2	$34.5	$36.0
Sales-Base Turn	2.02	1.93	1.71	1.52	1.51	1.66	1.99	2.07

Development of the Tiered Inventory Turns Metric

Supported Supply Chain Strategic Objective	Effectively and efficiently manage materiel.
Attribute	**Cost:** This metric computes turns for different segments of the inventory based on sales or another factor associated with turning a segment.
External or Internal	**Internal:** The computation of this metric is based on supply chain inventory data, including sales and disposals.

Description of the Tiered Inventory Turns Metric

Definition	• The inventory turn for the total inventory is the dollar value of sales for a year divided by the average dollar value of inventory for that year. • The inventory turn for sales-based inventory (i.e., on-hand inventory for forecasted AAO requirements) is the dollar value of sales for forecasted items divided by the average dollar value of sales-based inventory for that year. • Definitions for other inventory segments are to be determined.
Business Value	Inventory turns provide information on the flow of inventory through the DoD supply system. For forecasted requirements aimed at meeting customer recurring demand, inventory turns are an indicator of effectiveness and efficiency of requirements when combined with wholesale supply availability.
Goals and Trend Analysis	**Goals**: Not applicable, as this metric is used for analysis. **Trend**: An upward trend in this metric is positive for sales-based inventory turns if wholesale supply availability remains constant. An upward trend indicates that less inventory is being held to meet demand.

Computation	Average inventory is computed as the sum of the inventory at the beginning of the year and at the end of year divided by 2. Forecasted AAO requirements include retail requisition objectives, due-outs, safety levels, repair cycle levels, lead-time levels, and procurement quantities (as shown in the opening stratification position for serviceable and unserviceable on-hand stocks).
OSD Data Requirements	Currently, this metric is calculated with publicly available information.
General Display	Turns for total inventory and sales-based inventory. Figure 39 shows the general display for tiered inventory turns.

Relationships with Other Metrics

Key Relationships:

Excess On-Hand	Growth in excess on-hand will cause an inventory turn for the total on-hand inventory to decrease.
Value of Secondary Item Inventory	If inventory grows at a higher rate than issues (sales), the number of turns will decrease.
Wholesale Supply Availability	If the number of turns is increasing, wholesale supply availability may decrease in the future because fewer inventories are available to satisfy demand.

Supply Management Costs

Use of the Supply Management Costs Metric

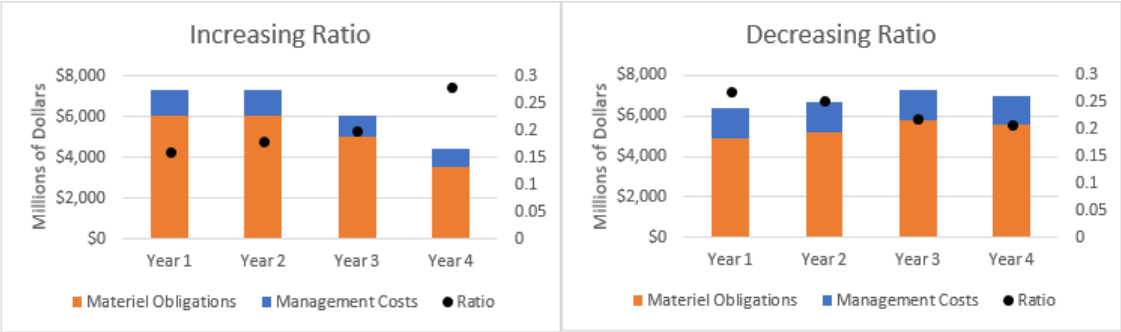
Supply management costs are the overhead costs of acquiring and distributing inventory. Materiel obligations are the costs of purchasing and repairing materiel for eventual sale.

A downward trend in materiel obligations signals that less materiel is being purchased and repaired. This might be in response to a downward trend in sales. A downward trend in overhead costs should accompany the downward trend in materiel obligations; however, there may be some lag because of the longer processes involved in changing overhead costs. Likewise, an upward trend in materiel obligations may be a response to an upward trend in sales. Again, overhead costs should also trend upward, but some lag may occur.

Figure 40 illustrates the general conclusions that can be made by plotting supply management costs over time. The chart on the left illustrates declining management costs relative to material obligations; the result is an increasing

ratio. The chart on the right shows increasing management costs relative to material obligations; the result is a decreasing ratio.

Figure 40. Information Shown on Supply Management Costs Graph



Development of the Supply Management Costs Metric

Supported Supply Chain Strategic Objective	Control costs.
Attribute	**Cost:** Quantifies the relationship between the dollar value of supply chain management costs and the value of supply chain materiel obligations.
External or Internal	**Internal:** Reported annually to ODASD(Logistics) to reflect end-of-year execution costs applicable to WCF inventories. The possibility of semi-annual reporting is being researched.

Description of the Supply Management Costs Metric

Definition	The ratio of materiel obligations to supply management costs, where • materiel obligations are the net materiel obligations for the purchase or repair of materiel that will be held in inventory or acquired from vendors for direct delivery to customers, and • supply management costs are the costs of operations normally associated with overhead, including personnel, receiving, storage, transportation, payroll, personnel travel, other WCF purchases, operating materials and supplies, rent/communications/utilities, and other service contracts.
Business Value	• Relates the annual cost of managing material to the investment in material • Measures the success of supply chain overhead cost-cutting efforts.
Goals and Trend Analysis	**Goal:** Although no goal exists for this metric, the DoD Comptroller's goal is to ensure working capital fund supply management costs can be recovered within 2 years, based on the projected volume of sales. **Trend:** Analysis focuses on whether the trends in materiel obligations and management costs are going in the same direction.
Computation	Metric computations are as follows:

	• Supply chain inventory materiel obligations are the sum of materiel acquisition and materiel repairs. • Supply management costs are the sum of currently reported overhead costs. • The ratio is computed as management costs divided by materiel obligations.
OSD Data Requirements	**Frequency:** Annually **Content:** The actual materiel obligations and supply management and support costs for a year as reported in the financial Fund 1 exhibits.
General Display	Supply management costs (overhead costs) and materiel obligations shown by year along with the ratio of overhead costs to materiel obligations. Figure 41shows the general display for supply management costs. In addition, two visuals provide detail on supply management costs: Figure 42 shows the breakout of materiel obligation costs into materiel non-energy procurement, materiel energy procurement, and materiel repair costs. Figure 43 shows the breakdown of management costs by area: • Advisory and Assistance Services • Civilian Personnel Compensation and Benefits • Depreciation • Equipment • Materiel and Supplies for internal operations • Military Personnel Compensation • Other Purchased Services • Other Purchases from Revolving Funds • Printing and Reproduction • Rent, Communications, Utilities and Miscellaneous Charges • Transportation of Things • Travel and Transportation of Personnel

Figure 41. General Display for Supply Management Costs

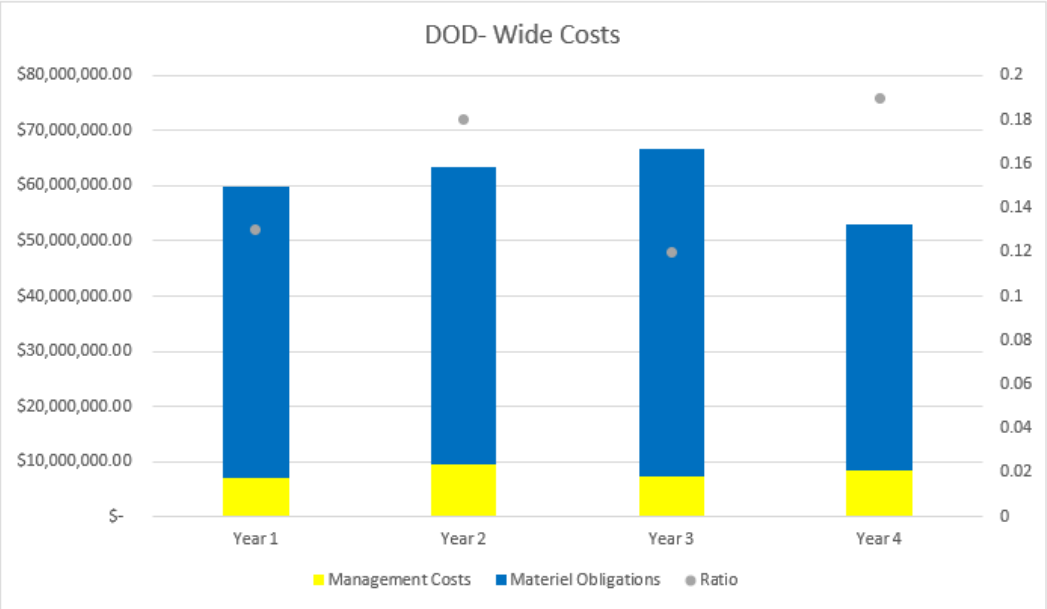
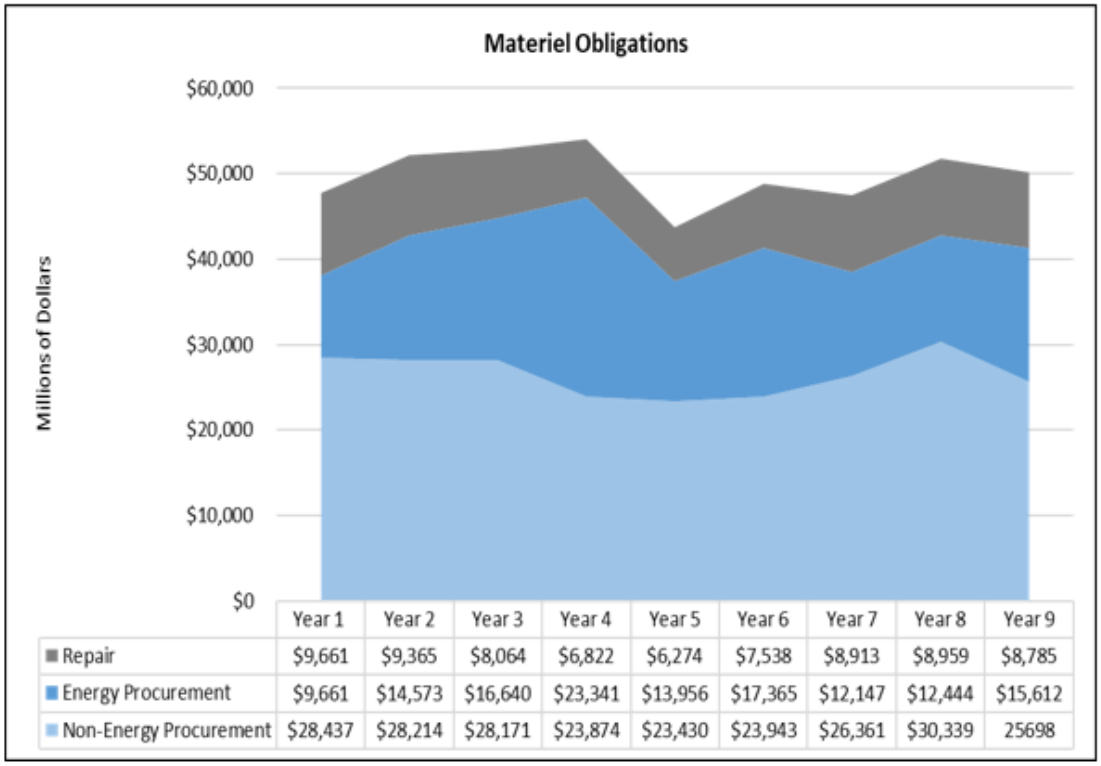


Figure 42. Display for Materiel Obligation Costs



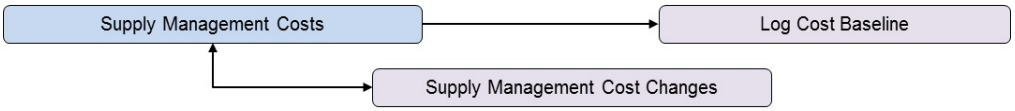
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Repair	$9,661	$9,365	$8,064	$6,822	$6,274	$7,538	$8,913	$8,959	$8,785
Energy Procurement	$9,661	$14,573	$16,640	$23,341	$13,956	$17,365	$12,147	$12,444	$15,612
Non-Energy Procurement	$28,437	$28,214	$28,171	$23,874	$23,430	$23,943	$26,361	$30,339	25698

Figure 43. Display for Management Costs

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Equipment	$26	$20	$16	$13	$15	$2	$3	$3	$23
Materiel & Supplies (For Internal Operations)	$73	$626	$71	$42	$36	$10	$9	$10	$19
Printing and Reproduction	$14	$12	$14	$11	$15	$23	$21	$6	$5
Travel and Transportation of Personnel	$55	$37	$33	$20	$23	$29	$30	$32	$36
Military Personnel Compensation	$51	$51	$56	$48	$50	$50	$50	$50	
Advisory and Assistance Services	$275	$148	$115	$77	$83	$73	$67	$58	$163
Rent, Communications Utilities & Misc. Charges	$253	$230	$239	$113	$125	$133	$137	$143	$167
Depreciation	$76	$61	$103	$179	$152	$704	$160	$174	$121
Transportation of Things	$688	$709	$548	$544	$280	$757	$718	$645	$833
Other Purchases from Revolving Funds	$954	$1,239	$1,202	$1,118	$1,008	$914	$899	$1,099	$2,280
Civilian Personnel Compensation and Benefits	$2,032	$2,096	$2,097	$2,010	$1,959	$1,893	$2,000	$2,080	
Other Purchased Services	$2,548	$4,085	$2,580	$4,283	$2,424	$2,520	$2,510	$2,842	$2,280

Relationships with Other Metrics

Key Relationships:



Supply Management Cost Change	Both metrics use the same cost and obligation data. Where the supply management costs metric uses cost and obligation data to compute a yearly ratio, the supply management cost change metric looks at how the costs change from year to year. As such, the supply management cost changes metric can provide insight into changes in the yearly ratios.
Log Cost Baseline	The costs in the log cost baseline represent the prices military customers pay for logistics services. An increase in supply management costs should increase supply costs in the log cost baseline.

Supply Management Cost Changes

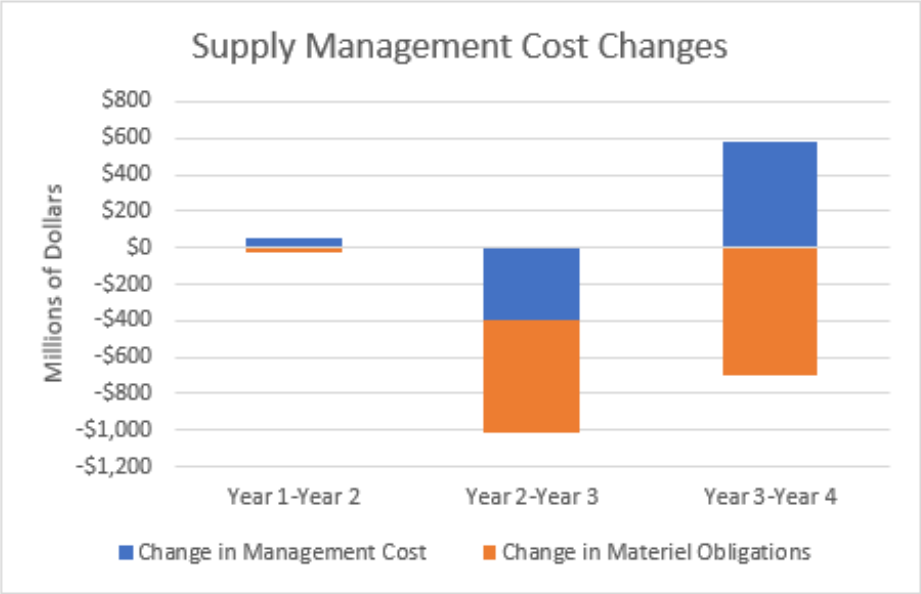
Use of the Supply Management Cost Changes Metric

This metric measures how obligations and management costs for WCF supply management activities are changing over time. In addition, it measures how the two main categories of costs are affecting the total costs of supply management activities.

Changes in costs should reflect changes in customer demand as well as changes in infrastructure and business practices that are aimed at reducing costs. They may also identify instances when changes in infrastructure or business practices lead to cost increases.

Figure 44 illustrates how management costs and materiel obligations change from one year to the next. The changes can be in the same direction (i.e., positive or negative) or in different directions (i.e., one positive and one negative).

Figure 44. Information Shown on Supply Management Cost Changes Graph



Development of the Supply Management Cost Changes Metric

Supported Supply Chain Strategic Objective	Control costs.
Attribute	**Cost:** The key to efficient cost control is controlling the growth in the price the Department pays for the materiel and the cost of managing that materiel.
External or Internal	**Internal:** Using the same input as the supply management cost metric, this metric quantifies how WCF materiel obligations and supply management costs change from one year to the next and the effect of those changes on the supply management activity costs.

Description of the Supply Management Cost Changes Metric

Definition	Dollar values of annual changes to management costs and materiel obligations, where • management costs are the sum of supply management overhead costs; • materiel obligations are the sum of materiel acquisition and repair obligations, or total cost minus overhead costs; • dollar value of annual changes is the delta between previous-year and current-year costs
Business Value	Indicates how much obligations and costs are changing and the net change in costs. Captures the trends associated with changes to supply management obligations and costs. Complements the supply management costs metric by providing more data about why the ratio changes over time.
Goals and Trend Analysis	**Goal:** Although no goal exists for this metric, the DoD Comptroller monitors the effect of supply management cost changes on prices and the solvency of the Defense Working Capital Fund. **Trend:** Analysis will identify if the costs are moving in the same direction or, if they are moving in opposite directions, the net change.
Computation	Metric computations are as follows: • Materiel obligations are the sum of materiel acquisition and materiel repair costs. • Supply management costs are the sum of currently reported overhead costs. • Total cost for a supply management activity is the sum of its management costs and its purchasing and repair costs. • The deltas would be current-year values minus previous-year values. • If the total of the changes in supply management costs and materiel obligations is positive (or negative), but both of the changes are not positive (or negative), then the change that is positive (or negative) is responsible for 100% of the change, and the other has zero responsibility.
OSD Data Requirements	**Frequency:** Annually. **Content:** The actual materiel obligations and supply management costs for a year in the form of a financial Fund 1 exhibit.
General Display	The following are shown as the metric: • The 12-month deltas in supply management costs. • The 12-month deltas in supply chain materiel obligations. • The 12-month deltas in total cost or net change. Figure 45 shows the general display for supply management cost changes.

Figure 45. General Display for Supply Management Cost Changes

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Net Change	$3,792.8	$3,181.0	-$13,620.	$129.1	-$2,504.1	$1,314.0	$6,834.9	$2,762.4
Chg in Mgt Costs	$2,379.2	-$2,298.9	$1,290.8	-$2,287.4	$937.4	-$504.2	$538.0	-$405.4
Chg in Mat Obs	$1,413.6	$5,479.9	-$14,911.	$2,416.6	-$3,441.4	$1,818.2	$6,296.8	$3,167.9

Relationships with Other Metrics

Key Relationship:

Supply Management Cost Changes → Supply Management Costs

Supply Management Costs	Measures the materiel obligations and supply and management costs for a particular year. The supply management cost changes metric computes the difference in those obligations and costs between two consecutive years.

Planning and Precision Metrics

Description

Definition of Planning and Precision as a DoD Supply Chain Attribute

The ability of the supply chain to accurately anticipate customer requirements and plan, coordinate, and execute accordingly.

Assessment Objective for Attribute

Determine if inventory management within the supply chain is improving.

Attribute Metrics

Outcome Metrics:	Excess On-Hand Quantifies the efforts of supply chain managers to reduce excess on-hand inventory.
	Due-In Potential Future Excess Quantifies the efforts of supply chain managers to reduce the number of DILS on contract.
Diagnostic Metrics:	Demand Forecast Accuracy and Bias Measures the accuracy of demand forecasts used to build inventory levels and quantifies any bias toward over- or under-forecasting.
	Unserviceable DLR Return Times Measures the time to move unserviceable DLR assets from the field to where they can be repaired or placed in storage for later repair. A lack of timeliness with unserviceable DLR returns will contribute to unnecessary growth in inventory or an increase in the number of backorders.
	Unserviceable DLR Over-Aged Due-Ins Quantifies the number of returns that are late. A lack of timeliness with unserviceable DLR returns will contribute to unnecessary growth in inventory or an increase in the number of backorders.
	Procurement Lead Time Quantifies the time it takes for materiel managers to order and receive materiel from DoD supply chain suppliers. Changes in the average procurement lead time can contribute to inventory growth or reduction.
	Procurement Lead Time Variance Quantifies the difference between the actual administrative and production lead times (ALT and PLTs) and those used for supply planning. Large variances could contribute to inventory growth or reduction.

Excess On-Hand

Use of the Excess On-Hand Metric

As one of the primary inventory management metrics, the excess on-hand metric quantifies the portion of the DoD inventory that is excess (i.e., not within the AAO and not held for economic or contingency reasons). The retention

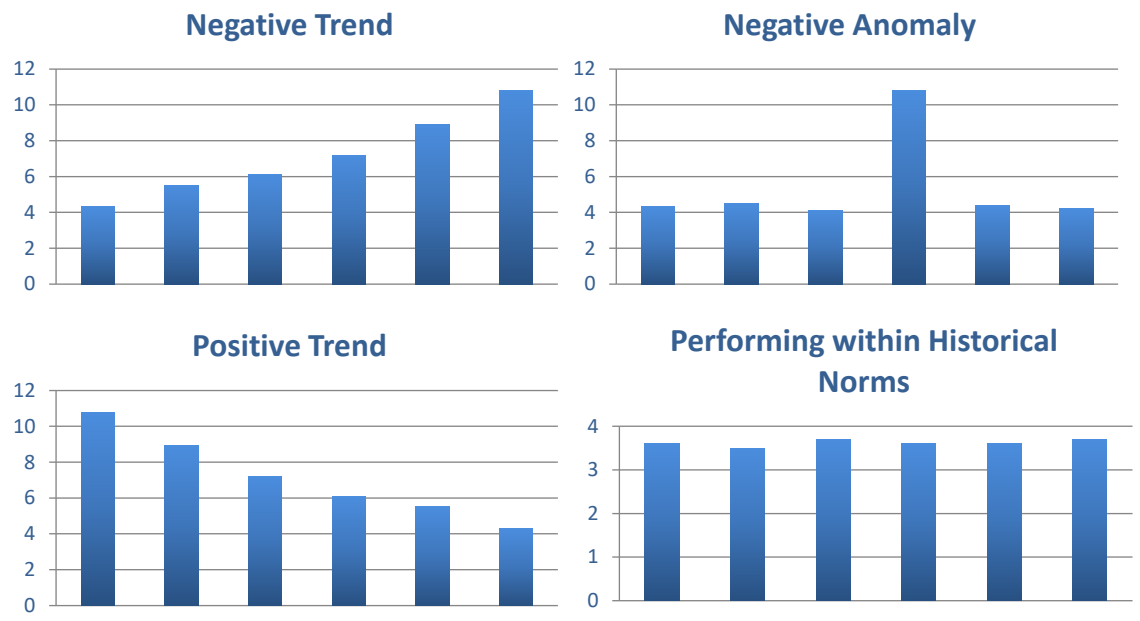
of excess on-hand inventory is a negative indicator of either the Department's ability to manage inventory or changes in materiel requirements. Changes in materiel requirements may occur as a result of circumstances beyond the control of inventory managers. The following are examples:

- Materiel rendered obsolete because of an engineering change to the configuration of the system that it supported.
- Increases or decreases in the demand for materiel as a result of new contingencies or drawdowns from contingencies.
- The phasing in of new weapon systems and the phasing out of old weapon systems—both of which change the requirements for supporting materiel.

The excess on-hand metric is given as a percentage to allow for targets that are independent of the total value of inventory.

The notional graphs in Figure 46 the general conclusions that can be made from plotting excess on-hand over time. An increase (or negative trend) in the excess on-hand indicates either falling requirements or declining retention levels.

Figure 46. Assessments from Excess On-Hand Graph



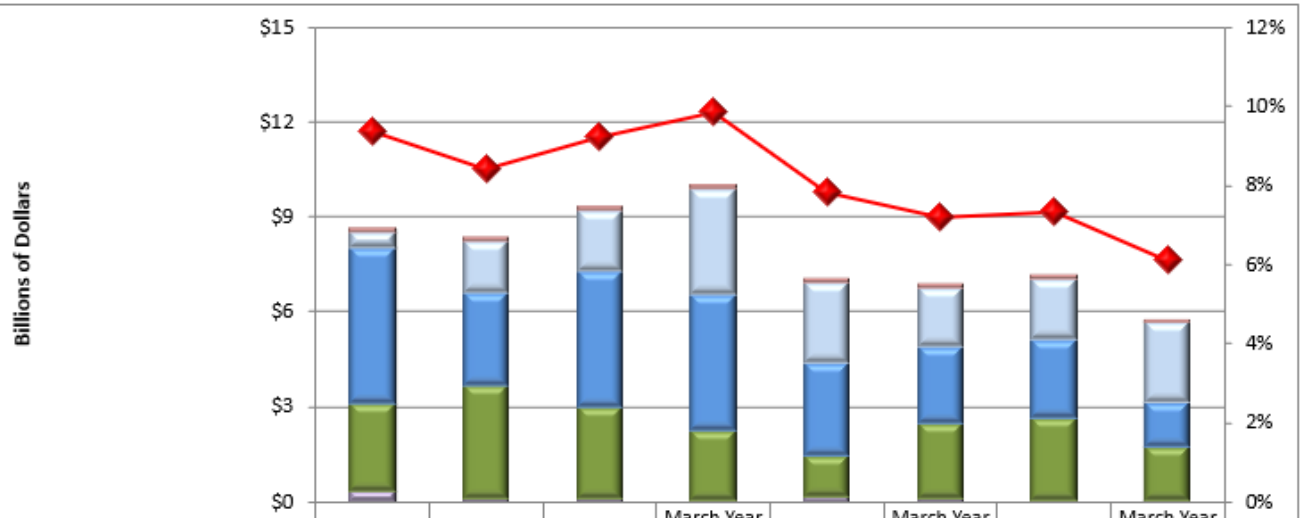
Development of the Excess On-Hand Metric

Supported Supply Chain Strategic Objective	Effectively and efficiently manage materiel.
Attribute	**Planning and Precision**: Shows the dollar value of inventory that is excess to the AAO (i.e., the total authorized requirement for an item) and is not needed for economic retention or contingency retention.
External or Internal	**Internal**: Reported to ODASD (Logistics) by the military services and DLA as part of their semi-annual inventory management reviews.

Description of the Excess On-Hand Metric

Definition	The dollar value of Government-owned and managed secondary item inventory that is categorized as potential excess at the end of the measured period, and the percentage of the total inventory dollars that potential excess constitutes. Potential reutilization stock, or PRS, is considered excess on-hand inventory.
Business Value	Quantifies the Department's success in reducing excess on-hand inventory by showing the outcome of reduction efforts against the target for reducing excess on-hand.
Goals and Trend Analysis	**Goals**: 10% for FY2013–14, 9% for FY2015, 8% for FY2016, 8% for FY2017, and 8% for FY2018, FY2019, and FY2020. **Trend**: A downward trend in this metric is positive, while an upward trend is negative.
Business Rules:	All secondary item on-hand assets are valued as follows: • Serviceable assets at their MAC. • Unserviceable assets at their MAC less the cost of repair.
OSD Data Requirements	**Frequency**: Semi-annual submission by military services and DLA—end of September values by February 15; end of March values by August 15. **Content**: Dollar value of on-hand inventory and the dollar value of excess on-hand inventory (i.e. PRS stock), and percentage of total value of inventory that is excess.
General Display	The value of PRS at full price, its value as a percentage of the total inventory value, and goal. The metric can be displayed DoD-wide or by component. Figure 47 shows the general display for excess on-hand.

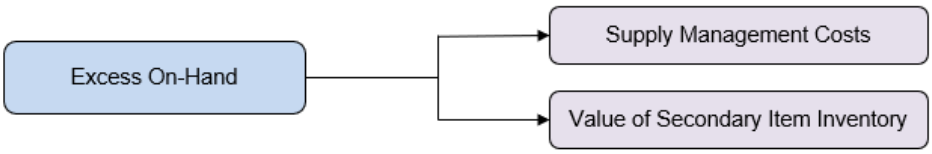
Figure 47. General Display for Excess On-Hand



	Year 1	Year 2	Year 3	March Year 4	Year 4	March Year 5	Year 5	March Year 6
Target %	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Army Excess On-Hand	$0.5	$1.6	$1.9	$3.3	$2.5	$1.8	$1.9	$2.5
Navy Excess On-Hand	$4.9	$2.9	$4.3	$4.3	$3.0	$2.4	$2.5	$1.4
Air Force Excess On-Hand	$2.8	$3.5	$2.9	$2.2	$1.3	$2.4	$2.6	$1.7
Marine Excess On-Hand	$0.3	$0.1	$0.1	$0.0	$0.2	$0.1	$0.0	$0.0
DLA Excess On-Hand	$0.3	$0.3	$0.3	$0.5	$0.6	$0.2	$0.2	$0.4
Total On-Hand Dollars	$94.5	$101.4	$102.5	$104.6	$96.4	$96.6	$98.8	$98.9
Total On-Hand Excess Dollars	$8.8	$8.5	$9.5	$10.3	$7.5	$6.9	$7.2	$6.0
% of On-Hand	9.4%	8.4%	9.2%	9.9%	7.8%	7.2%	7.3%	6.1%

Relationships with Other Metrics

Key Relationships:



Supply Management Costs	Excess on-hand increases the cost of storing materiel. The cost of storing materiel is one of the supply management costs submitted for the supply management cost metric.
Value of Secondary Item Inventory	Excess on-hand increases the total value of secondary item inventory.

Due-In Potential Future Excess

Use of the Due-In Potential Future Excess Metric

As the second of two primary inventory management metrics, this procurement due-in metric quantifies the portion of DoD's secondary item materiel that is on contract, above requirements as expressed in the AAO, and stratifies as PRS.

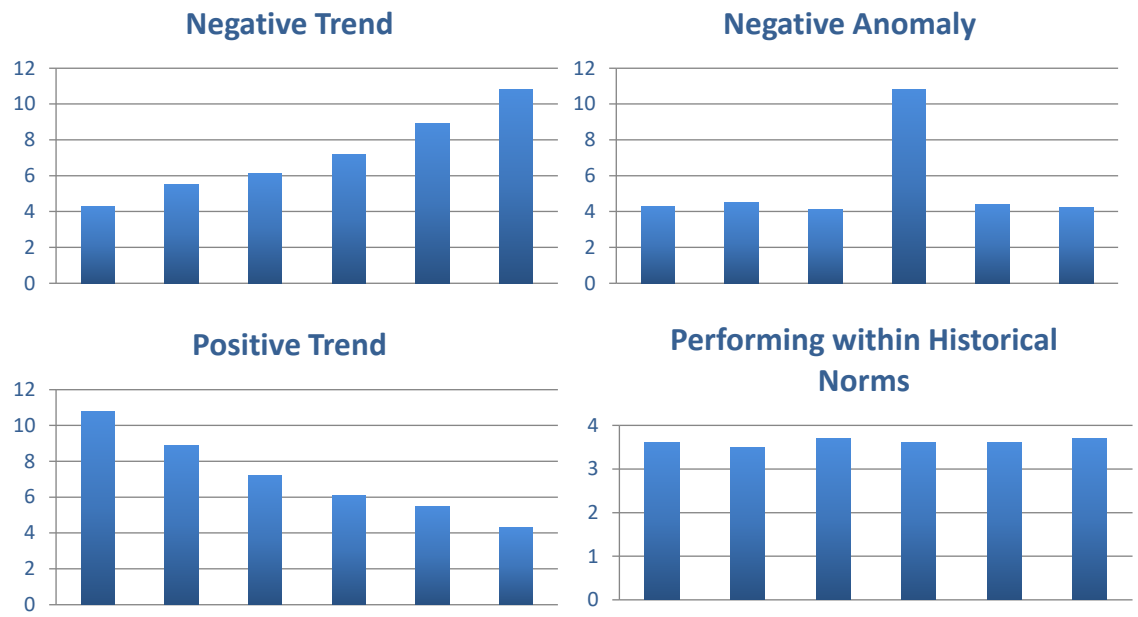
DoD procedures establish procurement quantities that are within AAO requirements; however, those requirements can change over time—after procurements are on contract. This may cause on-contract assets to stratify above AAO requirements, even though DoD procurement procedures do not include quantities that are targeted for retention stocks or excess stocks at the time of award.

To avoid bringing excess assets into the DoD supply system, the Department reviews all on-contract dollars identified as above AAO requirements. The purpose of the review is to determine if the contract should be retained as is, or if all or part of the contracted amount should be terminated. Review procedures include economic modelling. Besides economics, a review may determine that it is in the best interest of the government to retain the contract, for such reasons as the identification of new requirements, the need to secure the industrial base, diminishing manufacturing sources, quantity discounts, or long-term contract requirements. All reasons for not terminating contracted assets above the AAO must be documented.

By quantifying DILS, DoD captures the size of the review effort and the probability of bringing long supply into the DoD supply system. Like the excess on-hand metric, DILS is given as a percentage of the total due-in to allow for targets that are independent of the total value of contracted inventory.

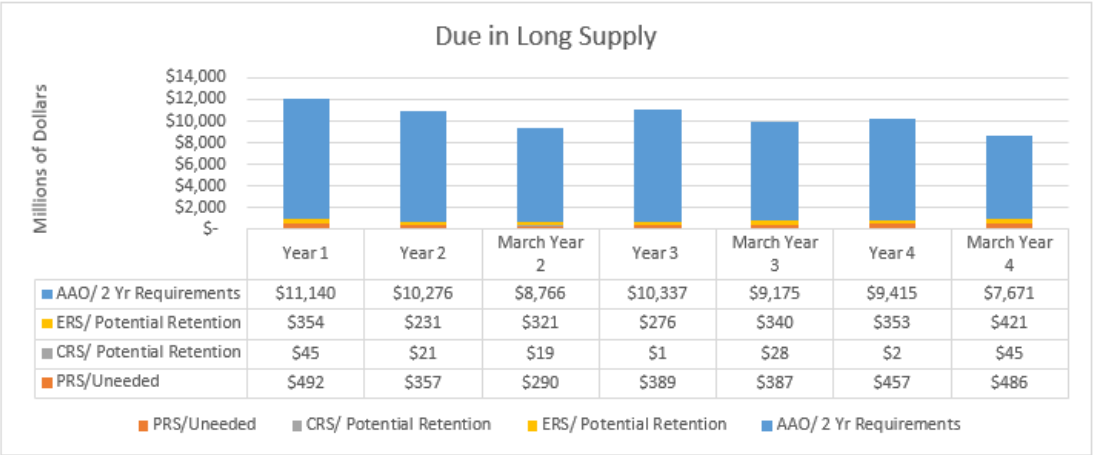
The notional graphs in Figure 48 illustrate the general conclusions that can be made from plotting due-in potential future excess over time. An increase (or negative trend) in the dollars show in the bottom right chart in 58 indicates more or less excess scheduled for delivery.

Figure 48. Assessments from Due-In Potential Future Excess Graph



The DILS graph in Figure 49shows what portion of the long supply stratifies to economic retention, contingency retention, and potential reutilization, as well as the percentage of total due-ins (i.e., on-order) that is long supply, the percentage that is due-in retention. Figure 50 shows how information is broken out into separate charts.

Figure 49. Information Shown on Due-In Long Supply Graph



	Year 1	Year 2	March Year 2	Year 3	March Year 3	Year 4	March Year 4
AAO/ 2 Yr Requirements	$11,140	$10,276	$8,766	$10,337	$9,175	$9,415	$7,671
ERS/ Potential Retention	$354	$231	$321	$276	$340	$353	$421
CRS/ Potential Retention	$45	$21	$19	$1	$28	$2	$45
PRS/Uneeded	$492	$357	$290	$389	$387	$457	$486

Development of the Due-In Potential Future Excess Metric

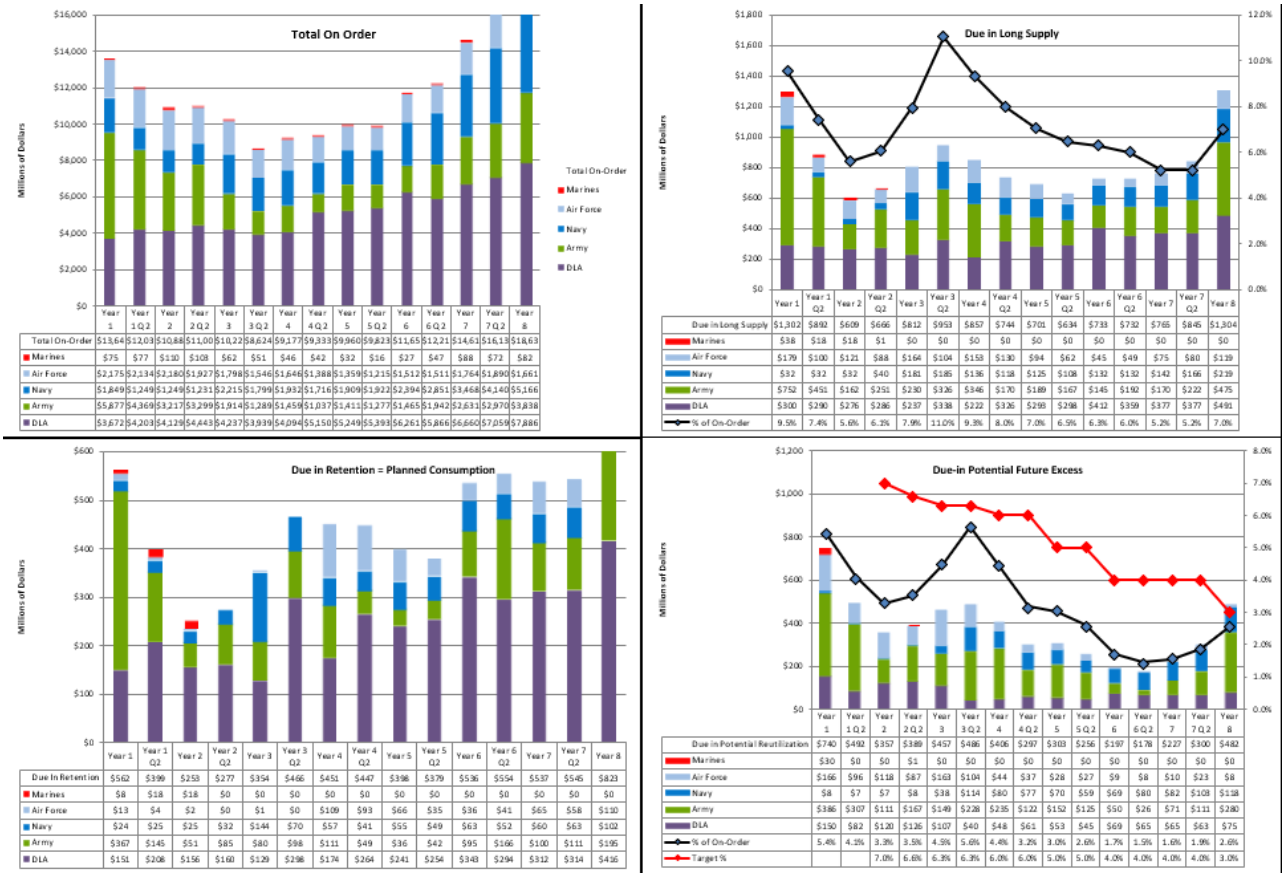
Supported Supply Chain Strategic Objective	Effectively and efficiently manage materiel.
Attribute	**Planning and Precision**: Quantifies the efforts of supply chain managers to reduce the number of DILS on contract that will result in excess inventory if delivered.
External or Internal	**Internal**: Reported to ODASD (Logistics) by the military services and DLA as part of their semi-annual inventory management reviews.

Description of the Due-In Potential Future Excess Metric

Definition	DILS is the dollar value of the secondary item on-contract procurements that exceed current item AAO requirements and the percentage of the total on-contract procurement dollars that those dollars constitute. DILS is reviewed for possible contract retention or termination and the percentage of total on-contract procurement dollars. Potential retention on-order is synonymous with on-order amounts that stratify to ERS and CRS. Due-in potential future excess is that part of DILS that stratifies as PRS.
Business Value	This metric quantifies the Department's success in reducing excess inventories coming into the DoD supply system by showing the outcome of reduction efforts against the target for reducing DILS that is PRS.

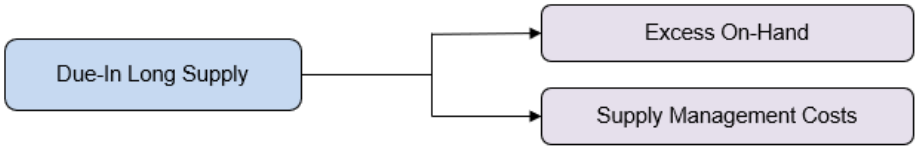
Goals and Trend Analysis	**Goals:** 6% for FY2014; 5% for FY2015; and 4% for FY2016 and FY2017. For FY2018, FY2019, and FY2020 the goal is 3%. **Trend:** A downward trend in this metric is positive, while an upward trend is negative.
Computation	• DoD components compute DILS by summing the dollars on contract that are above item AAOs. • DoD components compute DILS potential reutilization by summing the dollars on contract that are PRS. • DoD components compute DILS economic retention by summing the dollars on contract that are ERS. • DoD components compute DILS contingency retention by summing the dollars on contract that are CRS. • All secondary item on-contract assets are evaluated at their standard price (i.e., full price).
OSD Data Requirements	**Frequency:** Semi-annual submission by the military services and DLA—end of September values by February 15; end of March values by August 15. **Content:** Dollar value of total on-contract stocks; dollar values of DILS broken out by ERS, CRS, and PRS; long supply percentage of on-order total; long supply retention percentage of on-order total.
General Display	The display for this metric consists of the total on-order value: the values of the DILS economic retention, contingency retention, and potential reutilization. Figure 50 shows the general display for DILS, which includes the breakout of percentages for DILS retention and DILS reutilization.

Figure 50. General Display for Due-In Long Supply



Relationships with Other Metrics

Key Relationships:



Excess On-Hand	When received in the supply system, DILS may become PRS unless requirements have changed by the time it is delivered.
Supply Management Costs	DILS will increase management costs because the item manager and contracting officer must determine whether to retain or terminate a contract. If not terminated, the cost of receiving and stowing the delivery increases. Both of these costs are part of supply management costs.

Demand Forecast Accuracy and Bias

Use of the Demand Forecast Accuracy and Bias Metric

A demand forecast (for items with forecastable demand) is the basis for setting requirements levels. The results of inaccurate forecasts could be backorders or excesses.

A bias toward over-forecasting will set requirements levels higher than needed, which will lead to excess inventory. A bias toward under-forecasting will set requirements levels lower than needed, which will lead to shortages and backorders. By measuring accuracy and bias, this metric provides materiel managers with useful input to their requirements determination and demand planning process.

Trends in the demand forecast accuracy and bias metric can show if actions taken to improve forecasting are working at the aggregate level. Comparing the metric to the value generated by a naïve forecast can indicate if the forecast process is adding value. An example of a naïve forecast is a forecast that assumes that next year's demand will be the same as last year's demand. If a naïve forecast produces a higher accuracy and lower bias, then the forecast than the forecast process needs to be targeted for improvement.

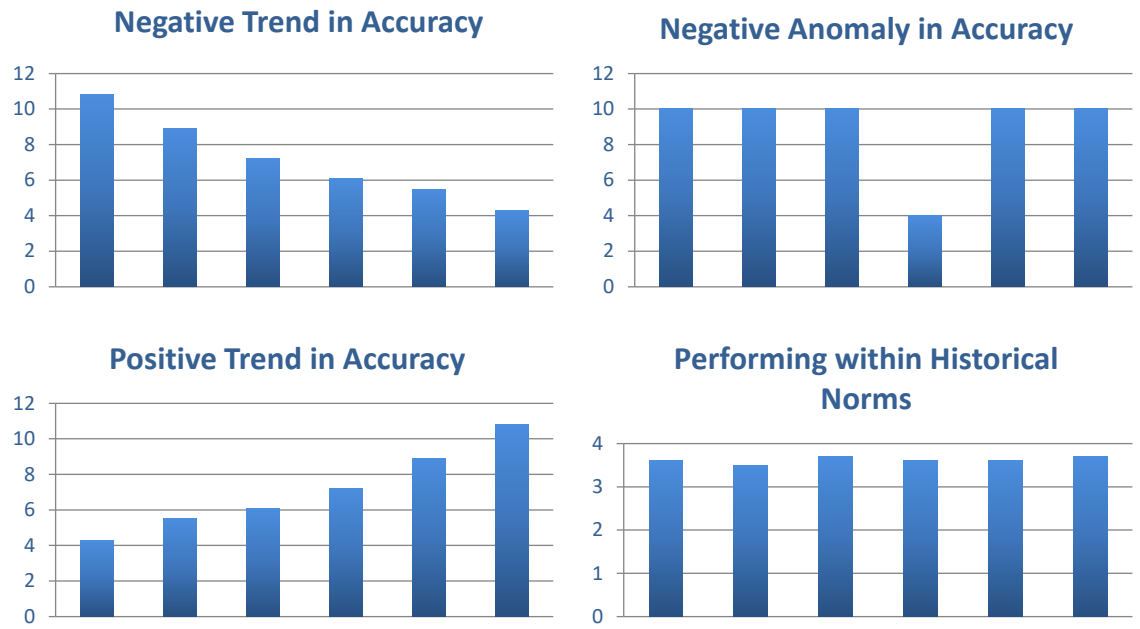
This approach to benchmarking first determines the forecast accuracy and bias associated with the naïve forecast. Thereafter, forecast accuracy and bias are computed for the forecasting technique used by a DoD component during its requirements determination or demand planning process. In essence, the naïve forecast re-baselines forecast accuracy and bias in each forecasting cycle. The forecast accuracy and bias from the naïve forecast and the component's forecast are then compared. The component's forecasting technique fails if the accuracy and bias of the forecast is worse than that of the naïve forecast.

The naïve forecast can also be used to determine the volatility of demand. In general, a large bias associated with the naïve forecast indicates demand is more volatile. Applying a forecasting algorithm to items with infrequent demand or to items with highly variable demand may produce an unacceptably low level of accuracy. It is sometimes better to base the stock requirements for items with volatile demand on minimum/maximum levels, which produce better customer support.

Other improvements could result from using appropriate forecasting algorithms or proper values for forecasting parameters, or from ensuring that manual overrides are legitimate and provide a higher degree of accuracy.

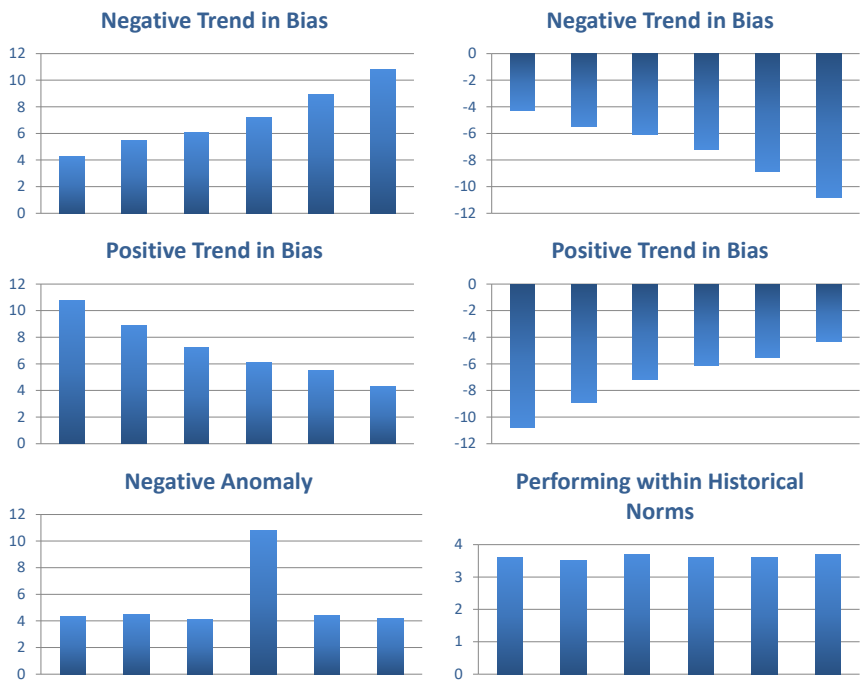
The notional graphs in Figure 51 illustrate the general conclusions that can be made from plotting forecast accuracy over time. A decrease or negative trend in accuracy could be related to dynamic changes in customer demand or poor forecasting techniques or adjustments.

Figure 51. Assessments from Forecast Accuracy Graph



The notional graphs in Figure 52 illustrate the general conclusions that can be made from plotting bias over time. Since bias can indicate either over- or under-forecasting, it can be positive or negative, respectively.

Figure 52. Assessments from Forecast Bias Graphs



Development of the Demand Forecast Accuracy and Bias Metric

Supported Supply Chain Strategic Objective	Accurately forecast customer materiel needs.
Attribute	**Planning and Precision**: Forecasts are the basis for most materiel management decisions for items with forecastable demand, which represent the majority of sales.
External or Internal	**Internal**: Metric and supporting data reported to ODASD (Logistics) by the military services and DLA as part of semi-annual inventory management reviews.

Description of the Demand Forecast Accuracy and Bias Metric

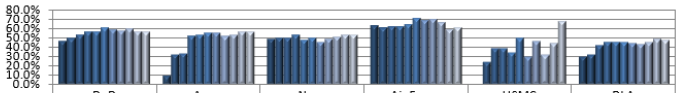
Definition	The difference between actual demand and forecasted demand, stated in a manner that quantifies any bias toward over- or under-forecasting. The positive or absolute value of that difference is used for accuracy, while the actual value (or signed value) of that difference is used for bias.

Business Value	Measuring and improving the accuracy and bias of demand forecasts will result in • greater precision in planning procurement, repair, and distribution actions; • inventory levels that better satisfy customer demand, while still reducing excess; and • more stability with suppliers.
Goals and Trend Analysis	The focus is on value-added benchmarks that compare naïve forecasts against current forecasts to show value of forecasting efforts (the naïve forecast is last year's demand).
Computation	**Item Population**: Accuracy and bias is only computed for forecastable items. **Demand Data**: Accuracy and bias will be computed using 12-month demand forecasts and actual demand for those same 12 months. **Formulas**: • *Accuracy:* (1 – [dollar-weighted absolute forecast error ÷ dollar-weighted demand]) × 100%. • *Bias:* (Dollar-weighted signed forecast error ÷ dollar-weighted demand) × 100%.
OSD Data Requirements	**Frequency:** Semi-annual submission by military services and DLA—end of September values by February 15; end of March values by August 15. **Content:** The accuracy and bias of annual demand forecasts, including the numerator and denominator for the accuracy and bias calculations, and the accuracy distribution of items and dollar demand with a segmentation that allows for DoD roll-up. Noting the inventory valuation method (LAC or MAC) is also required.

General Display	The display for this metric consists of
	• component aggregate forecast accuracy measurements;
	• component aggregate forecast bias measurements;
	• DoD-wide item and dollar distributions based on accuracy bands of <0%, 0–20%, 20–40%, 40–60%, 60–80%, and 80–100% (For purposes of the distribution display, negative forecast accuracy is shown as zero.); and
	• value-added measurements. Value-added displays show the accuracy and bias comparison between the naïve and actual forecasts for all items.
	  • Actual refers to the difference between actual demand and forecasted demand, stated in a manner that quantifies any bias towards over or under forecasting. The positive or absolute value of that difference is used for accuracy while the actual positive or negative value (or signed value) of that difference is used for bias.
	  • Naïve refers to the accuracy and bias of using the previous year's demand as a naive forecast is compared to accuracy and bias of the actual forecast to determine the value added of current forecasting techniques.
	
	shows the general display forecast accuracy and forecast bias measurements. shows the general display for the DoD-wide item and dollar distributions based on accuracy bands described above. Figure 55 shows the general display for value-added measurements.

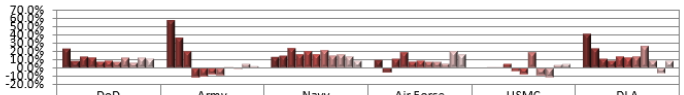
Figure 53. General Display for Forecast Accuracy and Forecast Bias

Forecast Accuracy



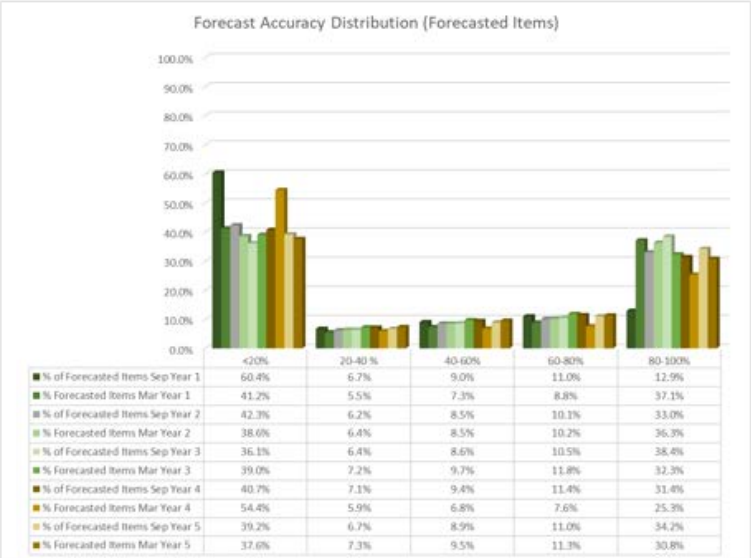
	DoD	Army	Navy	Air Force	USMC	DLA
Sep	46.7%	10.7%	49.2%	64.0%		30.2%
March	50.6%	32.0%	50.1%	61.7%	25.1%	32.4%
Sep	53.2%	33.5%	49.9%	62.8%	39.2%	42.7%
March	56.9%	52.0%	53.0%	62.9%	39.3%	46.2%
Sep	57.4%	53.8%	48.3%	65.1%	35.2%	45.7%
March	61.1%	56.0%	50.2%	70.9%	50.1%	45.8%
Sep	59.0%	55.3%	45.9%	68.7%	30.6%	45.2%
March	57.7%	52.7%	49.1%	69.7%	46.8%	43.0%
Sep	59.8%	53.4%	51.6%	67.2%	32.4%	46.1%
March	56.4%	57.3%	53.4%	58.9%	45.2%	49.6%
Sep	57.3%	56.9%	53.4%	61.3%	67.7%	48.3%

Forecast Bias

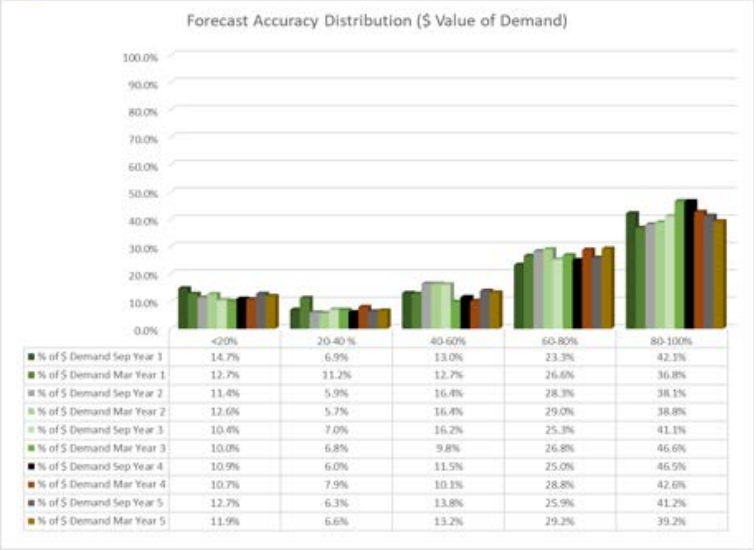


	DoD	Army	Navy	Air Force	USMC	DLA
Sep	24.2%	57.9%	14.2%	10.1%		41.5%
March	9.4%	36.4%	15.1%	-4.7%	1.9%	24.3%
Sep	14.5%	19.8%	23.6%	11.4%	1.7%	11.2%
March	12.5%	-11.0%	16.2%	19.1%	4.9%	9.3%
Sep	8.1%	-9.5%	20.1%	7.3%	-3.3%	14.7%
March	8.6%	-7.1%	16.2%	9.3%	-7.6%	12.3%
Sep	8.4%	-8.2%	21.4%	7.3%	19.1%	13.5%
March	12.7%	0.8%	15.8%	7.7%	-8.6%	26.1%
Sep	6.4%	-1.3%	16.3%	5.4%	-11.1%	8.8%
March	13.2%	5.8%	13.6%	19.8%	4.0%	-5.8%
Sep	11.7%	2.6%	8.7%	16.3%	5.0%	8.9%

Figure 54. DoD-wide Item and Dollar Demand Accuracy Distributions

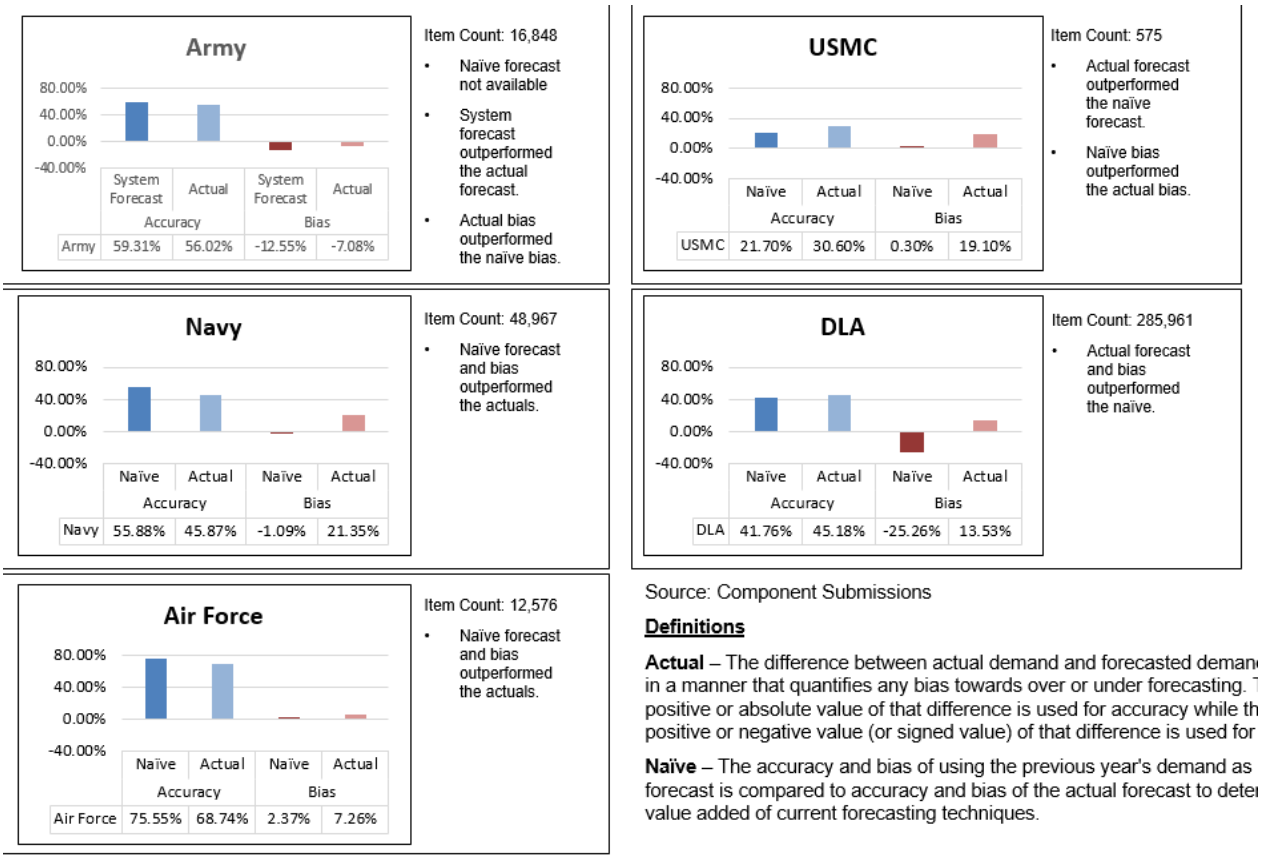


	<20%	20-40 %	40-60%	60-80%	80-100%
% of Forecasted Items Sep Year 1	60.4%	6.7%	9.0%	11.0%	12.9%
% Forecasted Items Mar Year 1	41.2%	5.5%	7.3%	8.8%	37.1%
% of Forecasted Items Sep Year 2	42.3%	6.2%	8.5%	10.1%	33.0%
% Forecasted Items Mar Year 2	38.6%	6.4%	8.5%	10.2%	36.3%
% of Forecasted Items Sep Year 3	36.1%	6.4%	8.6%	10.5%	38.4%
% Forecasted Items Mar Year 3	39.0%	7.2%	9.7%	11.8%	32.3%
% of Forecasted Items Sep Year 4	40.7%	7.1%	9.4%	11.4%	31.4%
% Forecasted Items Mar Year 4	54.4%	5.9%	6.8%	7.6%	25.3%
% of Forecasted Items Sep Year 5	39.2%	6.7%	8.9%	11.0%	34.2%
% Forecasted Items Mar Year 5	37.6%	7.3%	9.5%	11.3%	30.8%



	<20%	20-40 %	40-60%	60-80%	80-100%
% of $ Demand Sep Year 1	14.7%	6.9%	13.0%	23.3%	42.1%
% of $ Demand Mar Year 1	12.7%	11.2%	12.7%	26.6%	36.8%
% of $ Demand Sep Year 2	11.4%	5.9%	16.4%	28.3%	38.1%
% of $ Demand Mar Year 2	12.6%	5.7%	16.4%	29.0%	38.8%
% of $ Demand Sep Year 3	10.4%	7.0%	16.2%	25.3%	41.1%
% of $ Demand Mar Year 3	10.0%	6.8%	9.8%	26.8%	46.6%
% of $ Demand Sep Year 4	10.9%	6.0%	11.5%	25.0%	46.5%
% of $ Demand Mar Year 4	10.7%	7.9%	10.1%	28.8%	42.6%
% of $ Demand Sep Year 5	12.7%	6.3%	13.8%	25.9%	41.2%
% of $ Demand Mar Year 5	11.9%	6.6%	13.2%	29.2%	39.2%

Figure 55. Forecast Accuracy and Bias Value-Added Measurements



Source: Component Submissions

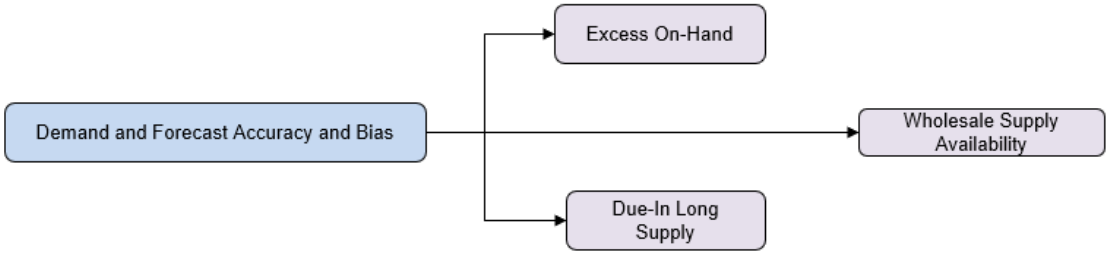
Definitions

Actual – The difference between actual demand and forecasted deman in a manner that quantifies any bias towards over or under forecasting. T positive or absolute value of that difference is used for accuracy while th positive or negative value (or signed value) of that difference is used for

Naïve – The accuracy and bias of using the previous year's demand as forecast is compared to accuracy and bias of the actual forecast to dete value added of current forecasting techniques.

Relationships with Other Metrics

Key Relationships:



Excess On-Hand	Over-forecasting and any bias toward over-forecasting can cause excess on-hand; stock levels are acquired and stored but demand does not occur at a level to support those levels.
Due-In Long Supply	Over-forecasting and any bias toward over-forecasting can result in DILS, as procurements are awarded but re-computation with actual demand calls for contract terminations.
Wholesale Supply Availability	Under-forecasting and any bias toward under-forecasting can degrade wholesale supply availability by causing the supply system to acquire and stock fewer assets than needed to fill demand.

Unserviceable DLR Return Times

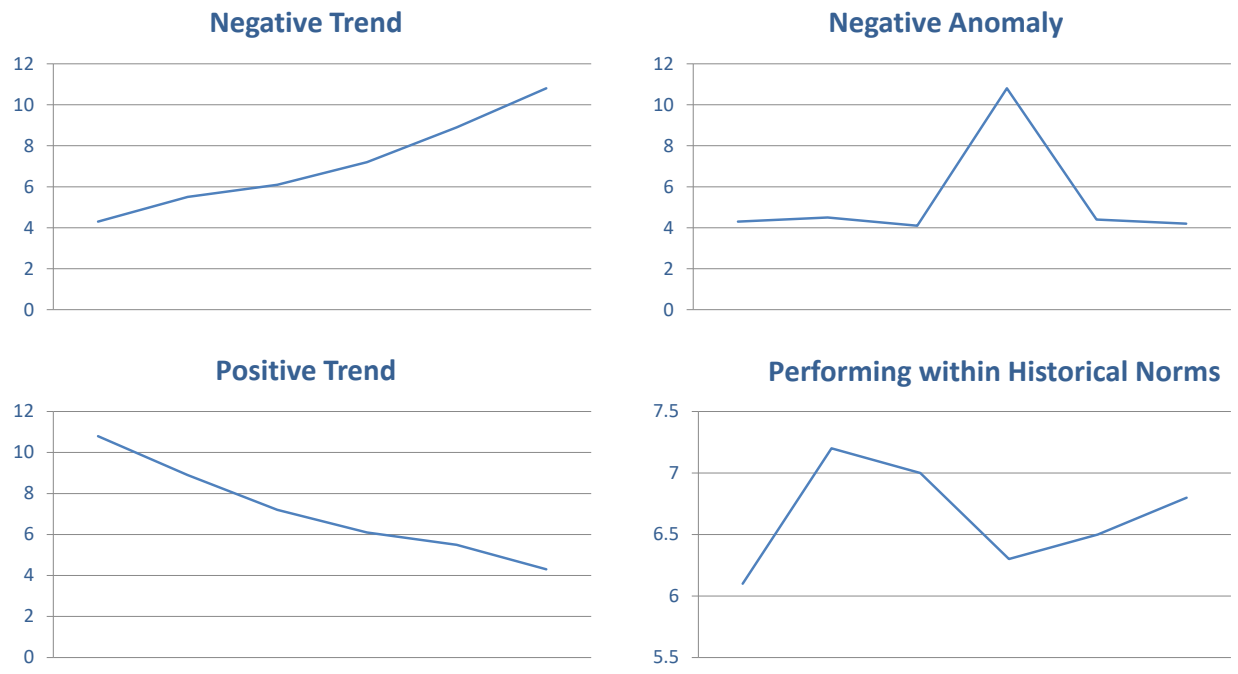
Use of the Unserviceable DLR Return Times Metric

Stable and timely return of unserviceable DLR assets minimizes delays at maintenance depots and the associated awaiting carcass (AWC) time. However, if times are increasing, that may increase AWC times and eventually lead to increases in backorders.

Rapid returns ensure a steady supply of unserviceable assets available for repair, thereby reducing the risks of backorders or excess order stocks.

The notional graphs in Figure 56illustrate the general conclusions that can be made from plotting return times over time. Increasing times are negative, in that they show greater delays in returning unserviceable materiel. Decreasing times are positive, in that they show shrinking delays. One-time spikes or jumps in return times are negative anomalies that should be researched to determine their cause.

Figure 56. Assessments from Unserviceable DLR Return Times Graph



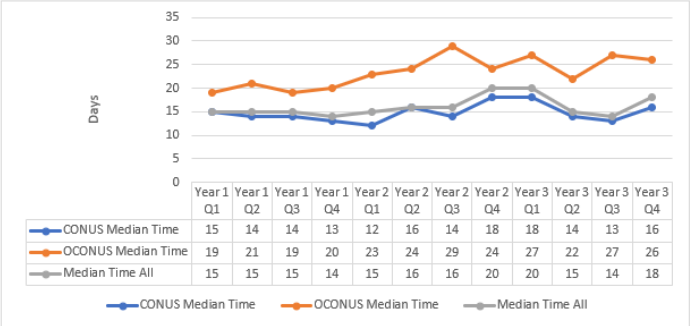
Development of the Unserviceable DLR Return Times Metric

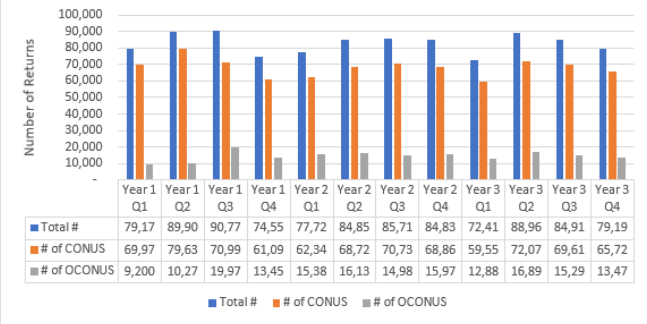
Supported Supply Chain Strategic Objective	Work with suppliers to ensure timely acquisition of materiel.
Attribute	**Planning and Precision**: Supply planning relies on unserviceable DLR returns to maintain a flow of assets through maintenance for repair and subsequent re-issue. Timely return of unserviceable materiel is essential to maintenance planning and execution.
External or Internal	**Internal**: This metric is tracked by the military services' materiel managers.

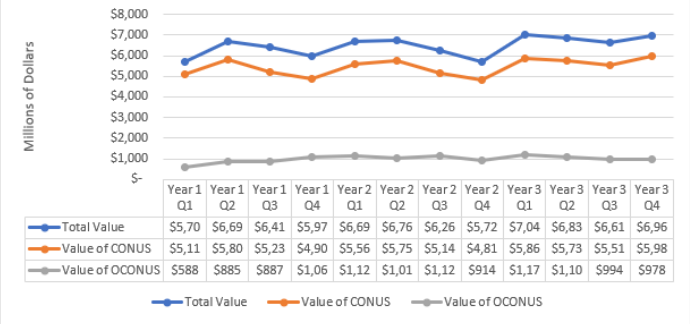
Description of the Unserviceable DLR Return Times Metric

Definition	The sum of base-processing time and in-transit time for an unserviceable DLR return. It begins when an organizational- or intermediate-level maintenance activity turns in (to supply) an unserviceable DLR asset that it cannot repair; it ends when the receipt of the unserviceable asset by a distribution depot or maintenance contractor is recorded by the materiel manager.
Business Value	• Measures the timeliness of unserviceable DLR returns for induction into maintenance programs. • Aids in supporting successful maintenance planning and execution. • Can be used to evaluate the synchronization of sustainment strategies, and thereby reduce the risk of increasing excess on order.
Goals and Trend Analysis	**Goals**: Although no goals exist for this metric, the objective is to show improvement over time. **Trend**: An upward trend is negative, while a downward trend is positive.
Computation	The metric is computed as the median return time for unserviceable DLR returns during the reporting period. The median time is the midpoint of all the return time observations (the time at which 50% of the observations are below and 50% above).
OSD Data Requirements	**Frequency**: Quarterly. **Content**: The median return time and number and dollar value of unserviceable DLR returns in a quarter, broken out by CONUS and OCONUS origins.
General Display	Number of returns, return time, and value of returns over time for CONUS and OCONUS by military service. Figure 57 shows the general displays for unserviceable DLR return time.

Figure 57. General Display for Unserviceable DLR Return Time

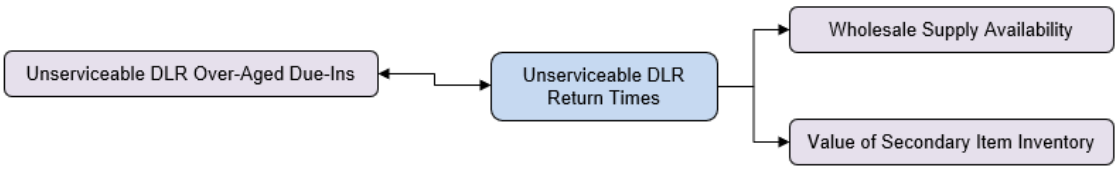






Relationships with Other Metrics

Key Relationships:



Unserviceable DLR Over-Aged Due-Ins	If late according to the service's standard for return times, unserviceable returns are identified as over-aged due-ins.
Wholesale Supply Availability	If unserviceable DLR assets are not returned to maintenance facilities in a timely manner, maintainers will not be able to meet their production schedules and serviceable assets needed to fill demand will not be available as planned. The resulting backorders will adversely affect wholesale supply availability.
Value of Secondary Item Inventory	Increasing return turns will drive inventory increases as additional spares will need to be purchased to cover demand while maintainers are waiting for carcasses to repair.

Unserviceable DLR Over-Aged Due-Ins

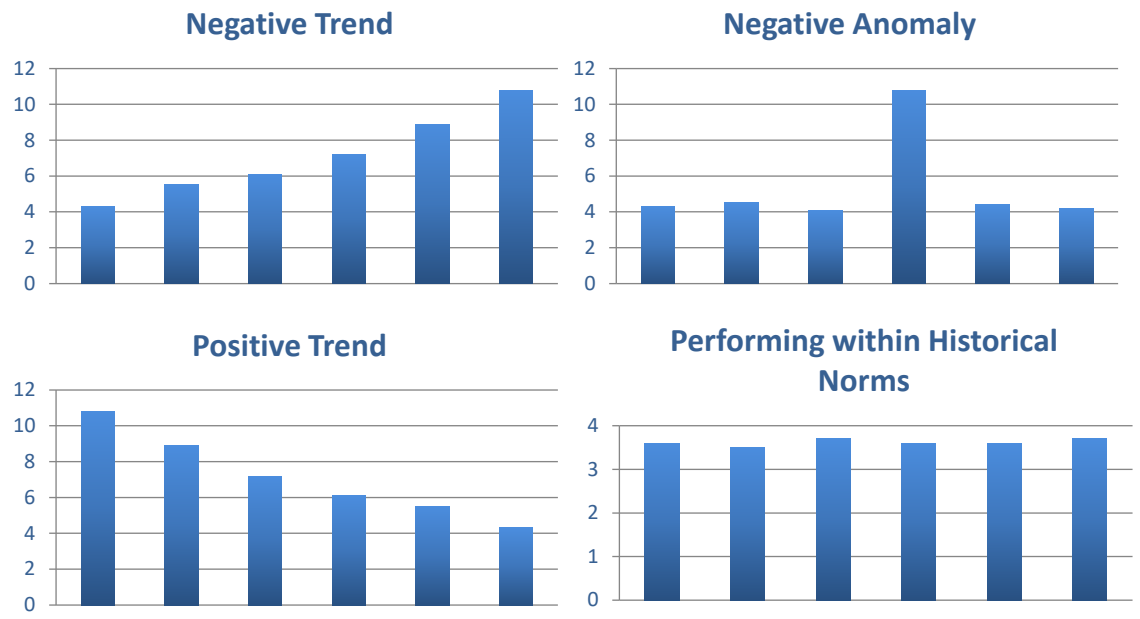
Use of the Unserviceable DLR Over-Aged Due-Ins Metric

The unserviceable DLR over-aged due-ins metric helps identify areas to research problems in the number or dollar value of over-aged due-ins of unserviceable DLR returns. It can also be used as an indicator of potential problems with overseas unserviceable returns, CONUS returns, or both.

If the number or value is increasing, then the risk of greater financial loss will increase, as will the risk of more backorders and the need for premature buys. If the number of over-aged due-ins is going down, that should mean fewer AWC delays at the maintenance line and more time to repair.

The notional graphs in Figure 58 illustrate the general conclusions that can be made from plotting over-aged due-ins over time.

Figure 58. Assessment from Unserviceable DLR Over-Aged Due-Ins Graph



Development of the Unserviceable DLR Over-Aged Due-Ins Metric

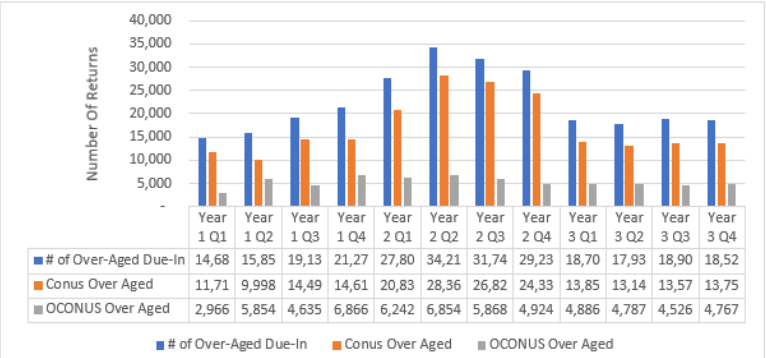
Supported Supply Chain Strategic Objective	Effectively and efficiently manage materiel.
Attribute	**Planning and Precision**: Supply planning relies on unserviceable DLR returns to maintain a flow of assets through maintenance for repair and subsequent re-issue. Timely return of unserviceable materiel is essential to maintenance planning and execution.
External or Internal	**Internal**: This metric is tracked by the military services' materiel managers.

Description of the Unserviceable DLR Over-Aged Due-Ins Metric

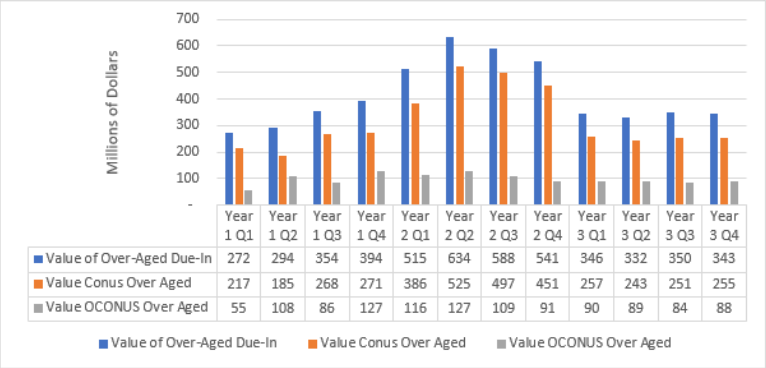
Definition	The number and dollar value of unserviceable DLR return actions that do not have a receipt at commercial or inter-service depot maintenance activity or storage activity (i.e., a Military Standard Transaction Reporting and Accountability Procedures [MILSTRAP] transaction with a D6 document identifier) within the days allowed from the date on the organizational or intermediate supply activity turn-in document (i.e., a MILSTRAP transaction with a D7 document identifier). The days allowed differ by military service.

Business Value	• Measures the timely return of unserviceable DLR assets for induction into maintenance programs. • Supports successful maintenance planning and execution. • Synchronizes sustainment strategies and reduces risk of increasing excesses on-order.
Goals and Trend Analysis	**Goals:** Although no goals exist for this metric, the objective is to show improvement over time. **Trend**: An upward trend is negative, while a downward trend is positive.
Computation	The following age criteria are used to identify over-aged due-ins: • **Army**: over 180 days (CONUS) and over 270 days (OCONUS). • **Navy**: for returns in the Navy's Carcass Tracking Shipper/System, over 45 days but less than 1-year (greater than 1 year considered an inventory loss); for other returns in the Navy's Stock-in-Transit (SIT) file, over 120 days. • **Air Force**: over 60 days. • **Marines**: over 60 days.
OSD Data Requirements	**Frequency**: Quarterly. **Content**: The number and dollar value of unserviceable DLR over-aged due-ins at the end of a quarter, broken out by CONUS and OCONUS origins.
General Display	Numbers and values over time for CONUS and OCONUS by military service. Figure 59 shows the general display graphs for unserviceable DLR returns over-aged due-ins.

Figure 59. General Display for Unserviceable DLR Returns Over-Aged Due-Ins



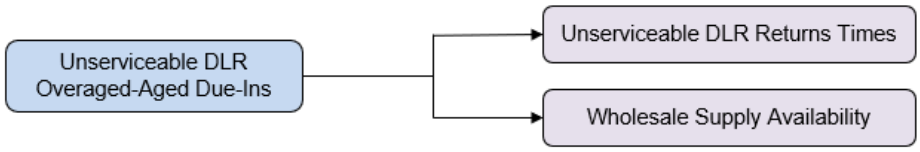
	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4
# of Over-Aged Due-In	14,68	15,85	19,13	21,27	27,80	34,21	31,74	29,23	18,70	17,93	18,90	18,52
Conus Over Aged	11,71	9,998	14,49	14,61	20,83	28,36	26,82	24,33	13,85	13,14	13,57	13,75
OCONUS Over Aged	2,966	5,854	4,635	6,866	6,242	6,854	5,868	4,924	4,886	4,787	4,526	4,767



	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4
Value of Over-Aged Due-In	272	294	354	394	515	634	588	541	346	332	350	343
Value Conus Over Aged	217	185	268	271	386	525	497	451	257	243	251	255
Value OCONUS Over Aged	55	108	86	127	116	127	109	91	90	89	84	88

Relationships with Other Metrics

Key Relationships:



Unserviceable DLR Return Times	Over-aged due-ins will extend return times. If over-aged due-ins are increasing, return times are also increasing, which increases backorders and inventory. Therefore, improvements in over-aged due-ins relate to improved return times.
Wholesale Supply Availability	If unserviceable DLR assets are not returned to maintenance facilities in a timely manner, maintainers will not be able to meet their production schedules, and serviceable assets needed to fill demand will not be available as planned. The resulting backorders will adversely affect wholesale supply availability.

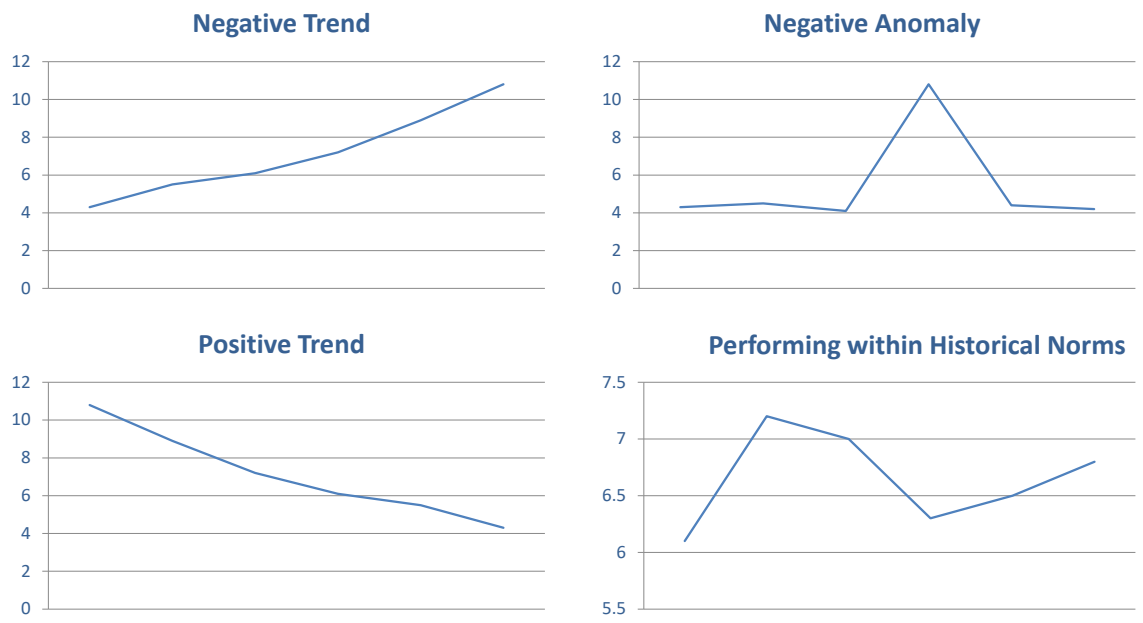
Procurement Lead Time

Use of the Procurement Lead Time Metric

The procurement lead time metric quantifies the average time it takes to procure materiel from commercial suppliers (calculated by taking the sum of ALT and PLT). Reducing that time provides more agility in inventory management, because the time to recover from inventory shortages is reduced. Also, since inventory is held to cover demand during the procurement lead time, a reduction in the lead time would also reduce the overall investment in inventory.

The notional graphs in Figure 60illustrate the general conclusions that can be made from plotting lead times over time. Increasing ALTs or PLTs are negative, in that they translate to increases in lead time and safety level requirements, which constitutes a need for an increased investment in inventory. Decreasing times are positive, in that they translate to fewer requirements and less investment in inventory. One-time spikes or jumps in times are negative anomalies that can cause backorders. These anomalies should be researched to identify their cause.

Figure 60. Assessments from Procurement Lead Time Graph



Development of the Procurement Lead Time Metric

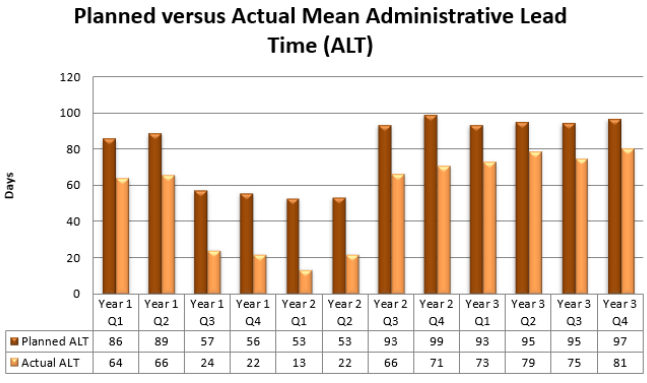
Supported Supply Chain Strategic Objective	Work with suppliers to ensure timely acquisition of materiel.
Attribute	**Planning and Precision**: Supply planning relies on accurate procurement lead times to ensure delivery of materiel according to schedule to meet expected customer demand.
External or Internal	**Internal**: Computed by the military service and DLA materiel managers.

Description of the Procurement Lead Time Metric

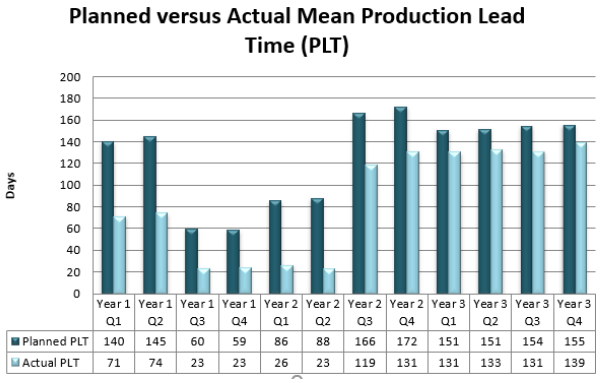
Definition	Procurement lead time is the sum of administrative lead times and production lead times.

	• ALT is the time interval between initiation of a purchase request and the date of signature on a representative contract. • PLT is the time interval between the award of a representative contract and receipt of the first significant delivery of purchased materiel into the supply system. For secondary items, procurement lead time is synonymous with acquisition lead time.
Business Value	Reductions in procurement lead time • could result in a cost avoidance in safety level requirements, and • enable more accurate inventory investments through shorter planning horizons.
Goals and Trend Analysis	**Goals**: Although no numeric goals exist for this metric, the objective is to shorten lead times where it is economical to do so and still maintain effectiveness. **Trend:** Upward trends in either actual or planned lead times translate to an increasing potential for backorders and increased safety levels.
Computation	DoDM 4140.01 Volume 2 contains the rules for starting and ending ALT and PLT.
OSD Data Requirements	**Frequency**: Semi-annual submission by the military services and DLA. **Content**: Each submission will have the following for the past two quarters: • The average ALT for items awarded contracts in a quarter. • The average PLT for items with procurements delivered in a quarter.
General Display	Actual and planned ALTs, PLTs, and total procurement lead times are displayed. "Actual" values are observed times taken from actual procurements. "Planned" values are the times used for computing inventory requirements levels. shows the general display for procurement lead time.

Figure 61. General Display for Procurement Lead Time



	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4
Planned ALT	86	89	57	56	53	53	93	99	93	95	95	97
Actual ALT	64	66	24	22	13	22	66	71	73	79	75	81



	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4	Year 2 Q1	Year 2 Q2	Year 2 Q3	Year 2 Q4	Year 3 Q1	Year 3 Q2	Year 3 Q3	Year 3 Q4
Planned PLT	140	145	60	59	86	88	166	172	151	151	154	155
Actual PLT	71	74	23	23	26	23	119	131	131	133	131	139

Relationships with Other Metrics

Key Relationships:

Procurement Lead Time Variance	Procurement lead time variance is derived from procurement lead time measurements. Planned times that go into measuring variance are based on historical measurements, while the actual times that go into measuring variance are current measurements of lead times. The procurement lead time variance determines the validity of the planned procurement lead times.
Value of Secondary Item Inventory	An inventory requirement is to cover demand when inventory levels are being replenished. Both procurement ALT and PLTs have associated requirements. Assets held to meet those requirements are part of secondary item inventory. An increase in those times will increase the requirements, which will, in turn, increase the value of inventory held to meet those requirements.

Procurement Lead Time Variance

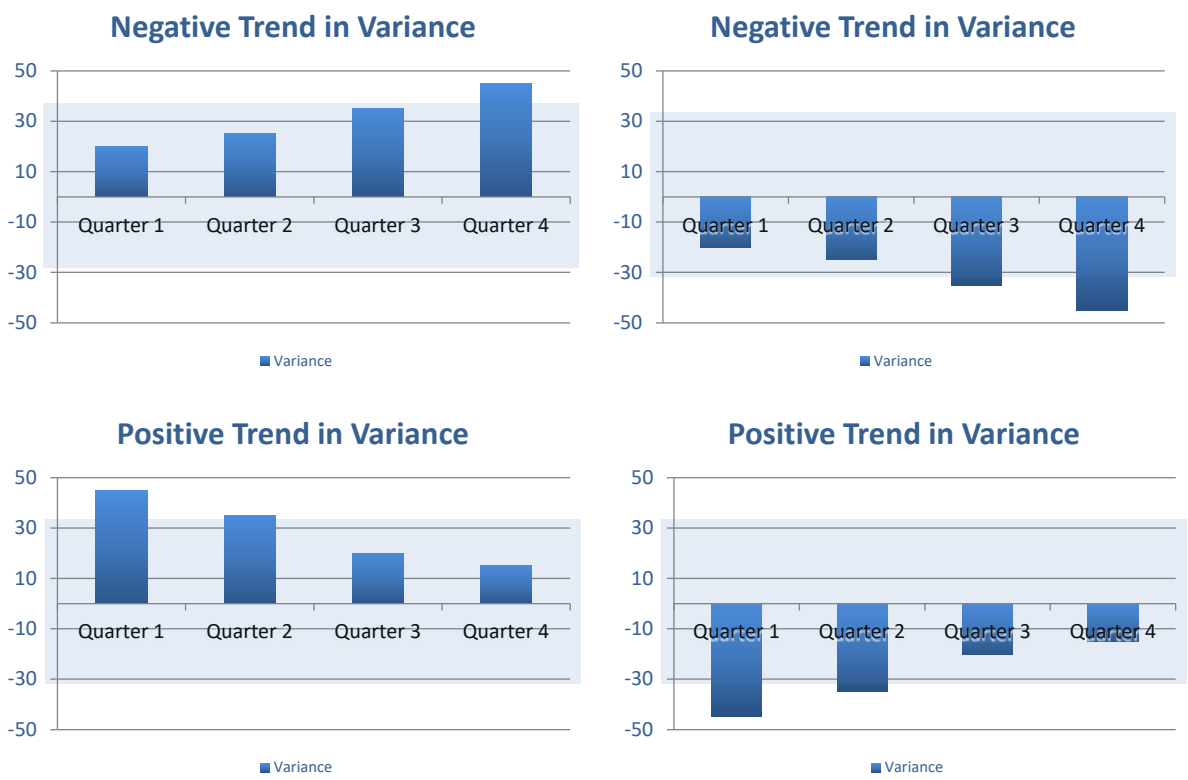
Use of the Procurement Lead Time Variance

The procurement lead time variance metric quantifies the average time to procure materiel from commercial suppliers relative to the planned time to receive materiel. Reducing the variance between planned and actual times provides more confidence in inventory management, because item managers have confidence in the planning factors. Also, since inventory is held to cover demand during the procurement lead time, a reduction in the time would also reduce the overall investment in inventory. Finally, the forecast of demand over the lead time could be more accurate because the impact of any forecast error is reduced with smaller variance.

ALT variance measures the difference between the ALT used to plan a procurement action and the actual ALT. If the time difference is positive, the planning ALT is overstated. If it is negative, the planning ALT is understated. The same is true of PLT variance, which measures the difference between the PLT used to plan a procurement action and the actual PLT. A variance with an absolute value of 90 days or less is considered good.

The notional graphs in Figure 62 illustrate negative and positive trends in variance in either ALT or PLT. A variance is negative if it is outside the 90-day band.

Figure 62. Assessments from Lead Time Variance Graph



Development of the Procurement Lead Time Variance Metric

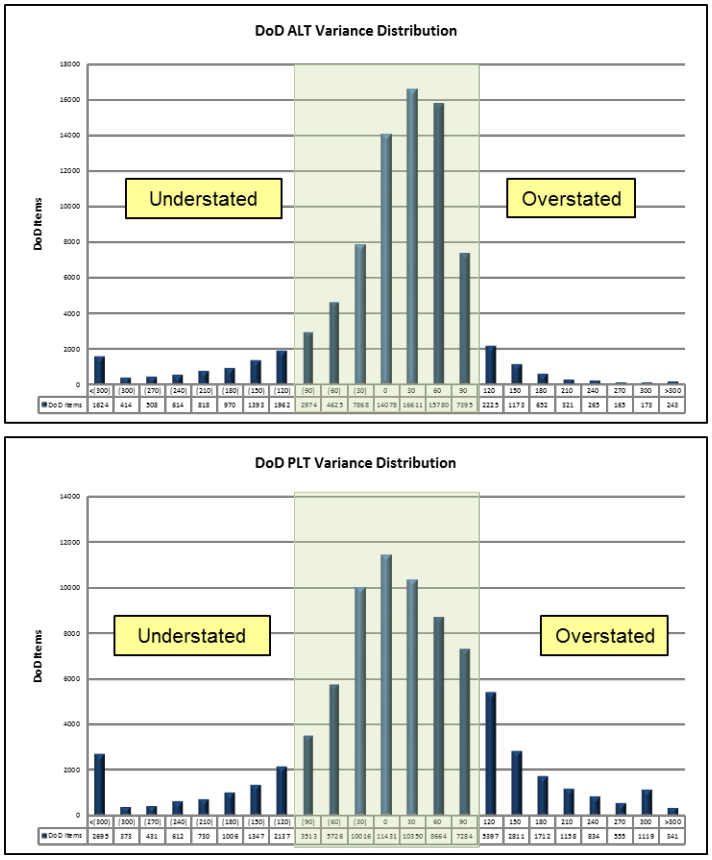
Supported Supply Chain Strategic Objective	Work with suppliers to ensure timely acquisition of materiel.
Attribute	**Planning and Precision**: Looks at the precision in the timing that goes into planning and executing buys. For supply planning to accurately schedule and execute procurement actions, the lead times used by planners needs to be as close as possible to the actual lead times.
External/Internal	**Internal**: Computed by the military service and DLA materiel managers using the same data as the procurement lead time metrics.

Description of the Procurement Lead Time Variance Metric

Definition	The variance or difference between actual lead times and lead times used to build requirements, where the lead times are ALT and PLT.
Business Value	• Provides information how well buyers and suppliers can meet lead times of record. • If reduced, improves the accuracy of supply planning and, thereby, reduces the risks of excess inventories and unexpected backorders.

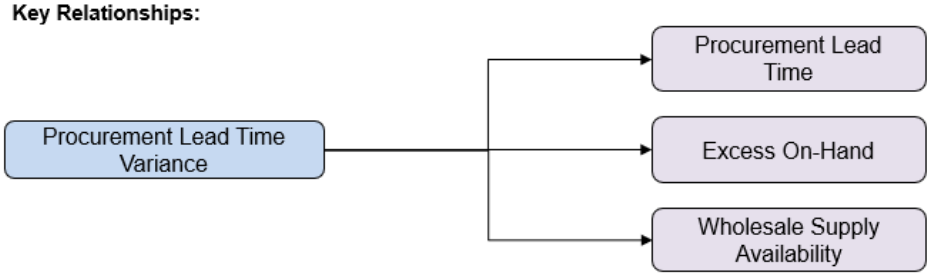
Goals and Trend Analysis	**Goal**: The target range for each variance is ±90 days. **Trend**: A trend that reduces variance is positive, in that it equates to more accurate forecasts of procurement awards and deliveries.
Computation	• ALT variance for a procurement action is equal to the planned ALT (when the purchase request was generated) minus the actual ALT as of contract award. • PLT variance for a procurement action is equal to the planned PLT (when the purchase request was generated) minus the actual PLT as of the receipt confirmation of a significant vendor delivery. • If an item has multiple occurrences of ALT or PLT variance in a quarter, they are averaged (summing the variance and dividing by the number of variances).
OSD Data Requirements	**Frequency**: Semi-annual submission by the military services and DLA. **Content**: Each submission will have the following for the past two quarters: • The number of items awarded contracts in a quarter and the difference between the actual ALT and the ALT in the file at the time the procurement request was generated. • The distribution of items based on ALT differences in 30-day intervals, going from −300 days to 300+ days. • The number of items for which procurements were delivered in a quarter and the difference in the actual PLT and the PLT at the time the procurement was awarded. • The distribution of items based on PLT differences in 30-day intervals, going from −300 days to 300+ days.
General Display	Actual and planned ALT and PLT are displayed. "Actual" values are observed times taken from actual procurements. "Planned" values are the times used for computing inventory requirements levels. Figure 63shows the general display for procurement lead time variance.

Figure 63. General Display of Lead Time Variance



Relationships with Other Metrics

Key Relationships:



Procurement Lead Time	The lead times used in planning are updated with actual lead times. If the differences between planned times and actual times remain large, the accuracy of planned times is reduced.
Excess On-Hand	Early deliveries can temporarily cause excess on-hand, because procured stock is obtained before it is needed.
Wholesale Supply Availability	Late deliveries can degrade wholesale supply availability because stock is not available when it is needed to fill demand.

Repair Cycle Time

Use of the Repair Cycle Time Metric

The repair cycle time metric quantifies the average time to repair materiel from maintainers relative to the planned time to receive materiel. Reducing the variance between planned and actual times provides more confidence in inventory management, because item managers have confidence in the planning factors. The target variance is within an absolute value of 90 days. Also, since inventory is held to cover demand during the repair cycle time, a reduction in the time would also reduce the overall investment in inventory.

The notional graphs in Figure 64 illustrate negative and positive trends in repair cycle time variance. A variance is negative if it is outside the 90-day band.

Development of the Repair Cycle Time Metric

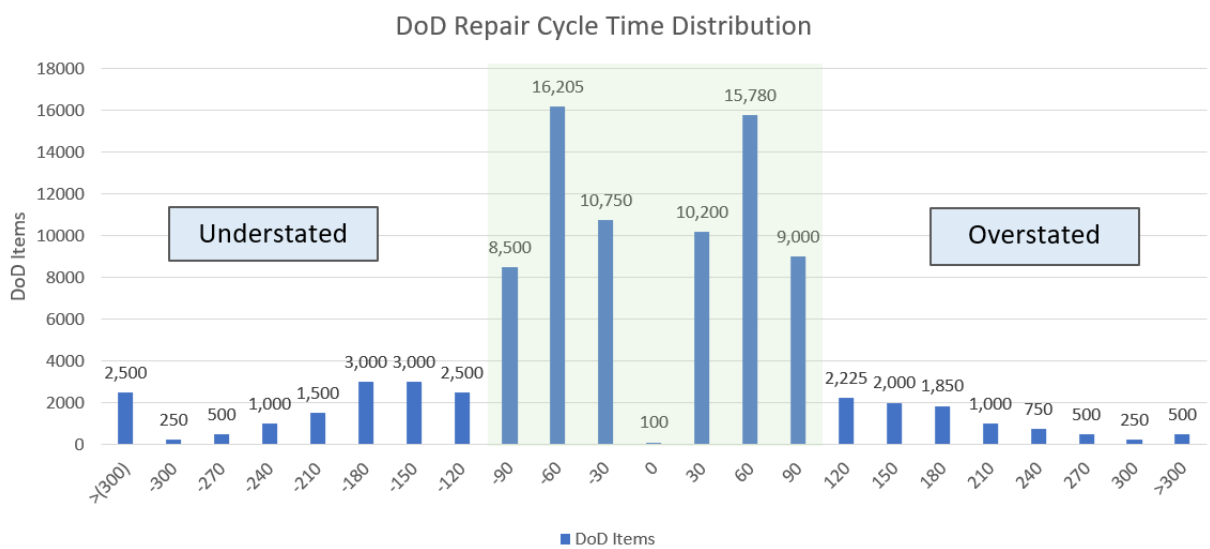
Supported Supply Chain Strategic Objective	Work with maintainers to ensure timely repair of materiel
Attribute	**Planning and Precision**: Looks at the precision in the timing that goes into repairing and re-issuing goods. For supply planning to accurately schedule and execute repair actions, the repair times used by planners needs to be as close as possible to the actual repair times.
External/Internal	**Internal**: Computed by the military service materiel managers.

Description of the Repair Cycle Time Metric

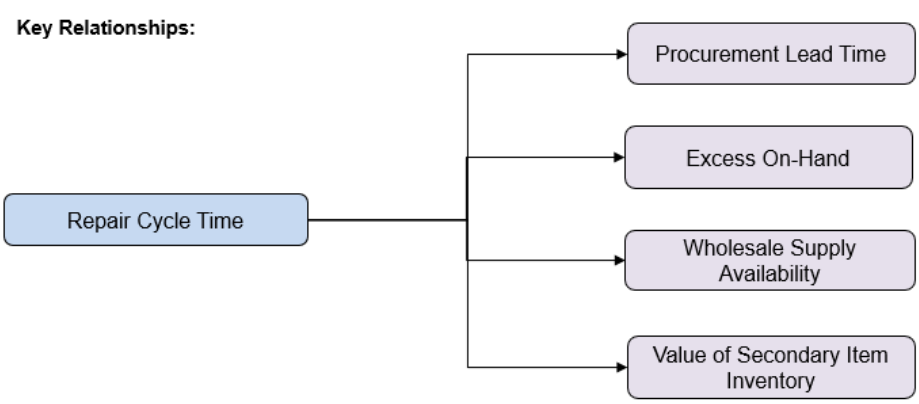
Definition	The variance or difference between actual repair cycle time and the repair cycle time used in planning. Depot repair cycle time is the sum of the following segments: • Transfer-to-Maintenance Time – begins with the request to pull the unserviceable asset from storage and ends when the organic or contractor maintenance activity receives it. • Maintenance-Shop Time – begins when maintenance receives the unserviceable DLR and ends when the availability of the serviceable asset is formally reported to storage. • Transfer-from-Maintenance Time – begins when the maintenance activity formally reports the availability of the serviceable DLR and ends when the serviceable asset is received in storage and recorded on the records of the ICP.
Business Value	This metric: • monitors the accuracy of supply chain planning • monitors contributing factors to stock level accuracy, including safety levels and repair cycle levels.

Goals and Trend Analysis	**Goal**: The target range for each variance is ±90 days. **Trend**: Movement towards or within target range is positive.
Computation	Rules for starting and ending repair cycle time is contained in DoDM 4140.01 Volume 2 Repair cycle time variance is equal to the planned repair cycle time was generated minus the actual repair cycle time.
OSD Data Requirements	**Frequency:** Semiannually **Content**: Each submission will have the following for the past two quarters:
General Display	1. Repair cycle time variance distributions for the latest semi-annual submission. 2. Net variance for most recent semi-annual submissions (up to 2) plus previous two fiscal years.

Figure 64. DoD Repair Cycle Time Distribution



Relationships with Other Metrics



Procurement Lead Time	Longer than planned repair cycle times lead to workarounds to meet demand forecasts. These workarounds cause unexpected procurements, which can take longer for suppliers to support compared to normal demand procurements.
Excess On-Hand	Early deliveries can temporarily cause excess on-hand, because repaired stock is obtained before it is needed.
Wholesale Supply Availability	Late deliveries can degrade wholesale supply availability because stock is not available when it is needed to fill demand.
Value of Secondary Item Inventory	An inventory requirement is to cover demand when inventory levels are being replenished. Repair cycle times have associated requirements. Assets held to meet those requirements are part of secondary item inventory. An increase in those times will increase the requirements, which will, in turn, increase the value of inventory held to meet those requirements.

Metrics Associated with Improving Inventory Management

Metrics Associated with Improving Inventory Management

The DoD developed the Comprehensive Inventory Management Improvement Plan (CIMIP) to document and guide its collective efforts to improve inventory management and support to the warfighter. The overall objective of the CIMIP (the Plan) was a prudent reduction in current inventory excesses as well as a reduction in the potential for future excesses without degrading materiel support to the customer.

The Plan establishes improved ways to invest resources and manage the Department's inventory. To track progress, functional level metrics were established as measures of success. The metrics are intended to monitor progress toward specific objectives:

- Reduce or terminate orders to ensure the inventory accurately reflects actual needs.
- Enhance the methods for determining the amount of inventory to retain.
- Ensure timely review and disposal of excess inventory.

To help accomplish these objectives, the Plan identifies ongoing efforts within the military services and DLA, along with Department-wide actions that enable the effective execution of the Plan**.**

This section of the DoD Supply Chain Metrics Guide contains detailed information on the suite of established inventory management functional metrics, separated by desired outcomes. That information includes a comprehensive description of each metric and instructions on how it should be used. Charts showing measurements over time are included to help interpret the performance of each metric.

A comprehensive assessment of DoD inventory management performance requires a review of all enterprise level metrics and inventory management functional metrics in this Guide and their interrelationships. In some cases, performance cannot be determined by looking at the metric itself; it must be assessed in concert with the performance of other related metrics. In such cases, the related metrics are provided for review in conjunction with the targeted metric.

Inventory Management Metrics by Desired Outcome

Desired Outcome for Total Asset Visibility

Objective

Minimize the size of buys by considering all inventories in the system.

Associated Metrics: Inventory Accessibility
Quantifies the percentage of inventory in component inventory management systems that other organizations or materiel inventory management systems can automatically access if negotiated or pre-approved by the owner of the assets.

Desired Outcome for Economic Retention

Objective

Ensure economic retention decisions are based on current cost factors and economic principles.

Associated Metrics: Economic Retention Stock (ERS) as a Percentage of Total Inventory
Quantifies the dollar value of ERS as a percentage of the total dollar value of all on-hand stock.

Economic Benefit of ERS
Quantifies the dollars saved for every dollar spent to retain current ERS (i.e., the ratio of savings to costs for ERS). If an item has an ERS benefit ratio of less than 1, its current level of ERS is not economical.

Desired Outcome for Contingency Retention Stock (CRS)

Objective

Ensure contingency retention stockage is justifiable in terms of the possible future need to support contingency use.

Associated Metrics: Contingency Retention Stock (CRS) as a Percentage of Total Inventory
Quantifies the dollar value of CRS as a percentage of the total dollar value of all on-hand stock.

CRS Reason Codes
Quantifies the dollar value of DoD component CRS by CRS reason code.

Desired Outcome for Storage and Direct Vendor Delivery

Objective

Use commercial vendors to store items that generate increased storage costs when use of those vendors represents the best value to the government.

Associated Metrics:

Secondary Item Storage Costs–Distribution Depots
Quantifies the aggregated cost of storing secondary item inventory in DoD distribution depots, as well as that cost as a percentage of the value of secondary item inventory.

Secondary Item Storage Footprint
Quantifies the cubic feet of storage space occupied by a DoD component's secondary item inventories.

Desired Outcome for Items with No Demand

Objective

Eliminate storage of items with a history of no demand and a low probability of future demand, unless there is an overriding reason to retain them.

Associated Metric:

Value of Inventory with 0–10+ Years of No Demand
Quantifies the dollar value of inventories for items with zero years of no demand, 1 year of no demand...on up to 10+ years of no demand.

Desired Outcome for Disposition of Potential Reutilization Stock

Objective

Ensure timely disposal of PRS that the DoD components stratify as excess.

Associated Metrics:

Potential Reutilization Stock (PRS) Disposition
Quantifies the review and disposition of potential reutilization stock.

Disposal Dollars for Reparable and Consumable Items
Quantifies the dollar value of materiel that the military services and DLA send to disposal (i.e., DLA Disposition Services), broken out by serviceable reparable items, unserviceable reparable items, and consumable items.

Desired Outcomes for Other Inventory Improvement Actions

Objective

Right size the DoD inventory to meet the needs of the warfighter.

Associated Metrics:

AAO Stocks as a Percentage of Total Inventory
Quantifies the dollar value of AAO stock as a percentage of the total dollar value of all on-hand stock.

AAO Inventory Segmentation
Quantifies the dollar value of DoD Component AAO stocks by requirement.

Inventory Accessibility

Use of the Inventory Accessibility Metric

The ability to use inventories across the DoD supply chain to fill customer demand and offset new procurements has long been a goal of DoD wholesale materiel managers. While wholesale inventories managed by the military services and DLA are already visible and accessible, not all retail inventories are visible and accessible to wholesale managers.

Inventories that are visible and accessible include service-managed unique item inventories, reparable items managed by a primary inventory control activity, DLA-managed inventories, and DLA items at service sites that are part of the DLA In-Storage Visibility (ISV) program.

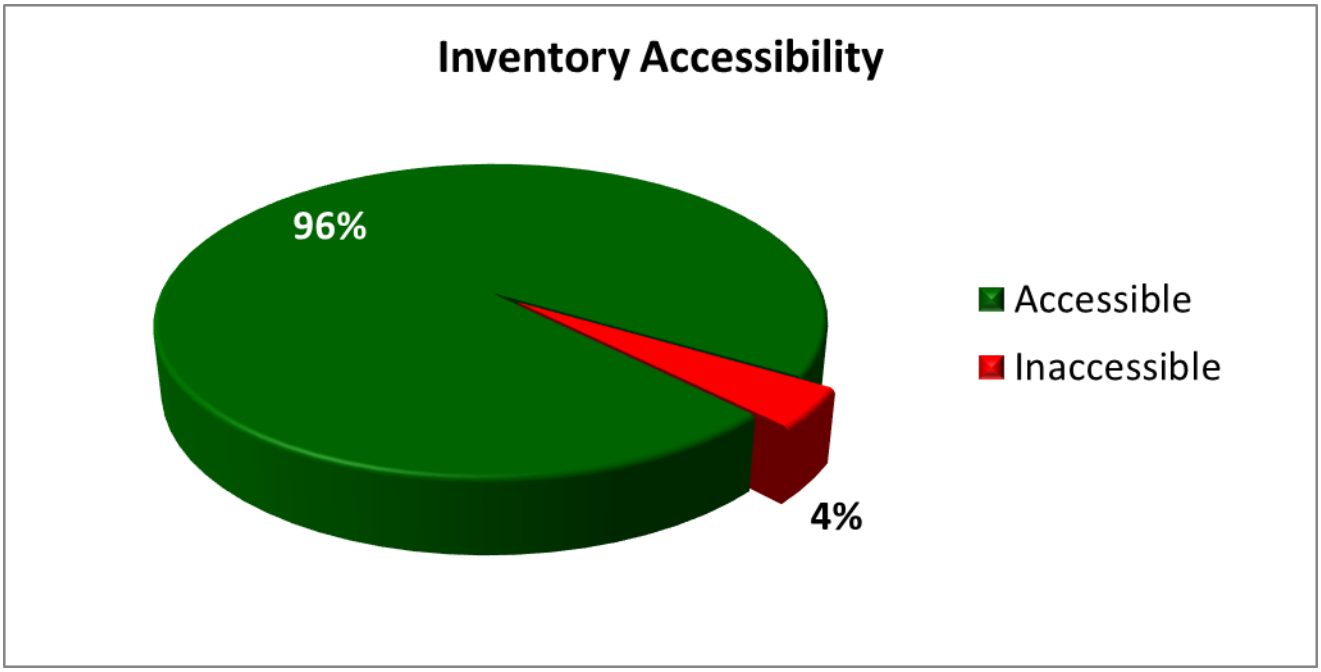
Target retail inventories that are currently not visible or accessible include common service-managed reparable items managed by a secondary inventory control activity, common service-managed consumable items, and DLA-managed consumable inventories at non-ISV sites.

To achieve the goal to use inventories across the DoD supply chain to fill customer demand and offset new procurements, a target inventory must be under an automated materiel management system that is electronically accessible to materiel managers. Those managers can then see what is in inventory and, under approved business rules, access assets needed to fill customer demand or offset procurement actions.

This inventory accessibility metric measures the success of the Department in achieving the goal of total asset visibility and accessibility of target inventories. It can be used to identify inventories for which visibility or accessibility is targeted and the progress in achieving visibility and accessibility targets.

The chart in Figure 65illustrates how inventory accessibility is measured.

Figure 65. Information Shown in Inventory Accessibility Graph



Development of the Inventory Accessibility Metric

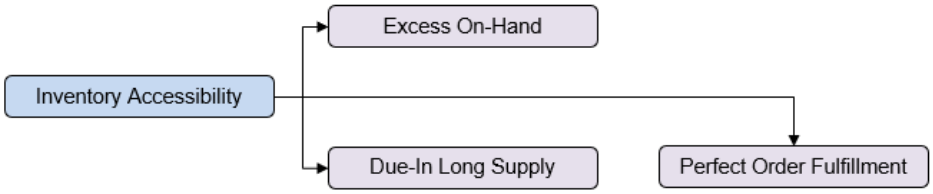
Sub-Plan	**B: Total Asset Visibility:** Measures the percentage of inventory that is visible and accessible (if negotiated or pre-approved by the owners of the assets) to DoD organizations outside of the managing organization for the purposes of fulfilling requisitions or reducing buys.
External or Internal	**Internal**: Computed by the military service and DLA materiel managers.

Description of the Inventory Accessibility Metric

Definition	The percentage of inventory dollars in Component inventory management systems that other Component inventory management systems can automatically access.
Business Value	One objective of Sub-Plan B is to improve the system-wide use of inventory through increased asset visibility and the capability to use that visibility to offset the need to procure or repair additional assets. This metric measures the success of actions to provide inventory visibility and accessibility in support of that intent.
Goals and Trend Analysis	**Goal:** Access to 90% of targeted inventory. Targeted Inventory is the portion of inventory that the owning component determined that they want to make available to others. **Trend:** Although no trend analysis is conducted, the objective is to increase inventory accessibility over time.
Computation	The percentage of inventory dollars accessible is computed by dividing the total inventory dollars accessible in automated Component systems by the total targeted inventory dollars.
OSD Data Requirements	**Frequency:** Annual data submission. **Content:** The following dollar values apply for each component (i.e., each military service and DLA): • Accessible reparable inventory • Accessible consumable inventory • Inaccessible reparable inventory • Inaccessible consumable inventory
General Display	The accessible and inaccessible percentages of total inventory are displayed. Breakdowns are available by DoD component and by consumable and reparable item. Figure 65shows the general display for inventory accessibility.

Relationships with Other Metrics

Key Relationships:



Due-In Long Supply	The ability to use inventory across the supply chain to offset procurements reduces the amount of inventory purchased. It also reduces the potential purchase of DILS by reducing the size of procurements and inventory churn within the supply chain.
Excess On-Hand	Reducing DILS reduces the potential for excess inventory brought into the supply system. Inventory accessibility also reduces inventory churn by using retail excesses that create variability in demand and returns. Less churn stabilizes levels and reduces the potential for excess on-hand inventory.
Perfect Order Fulfillment	The ability to use inventory across the supply chain to fill backorders means more orders will be filled on time; thereby, increasing the number of perfect orders.

ERS as a Percentage of Total Inventory

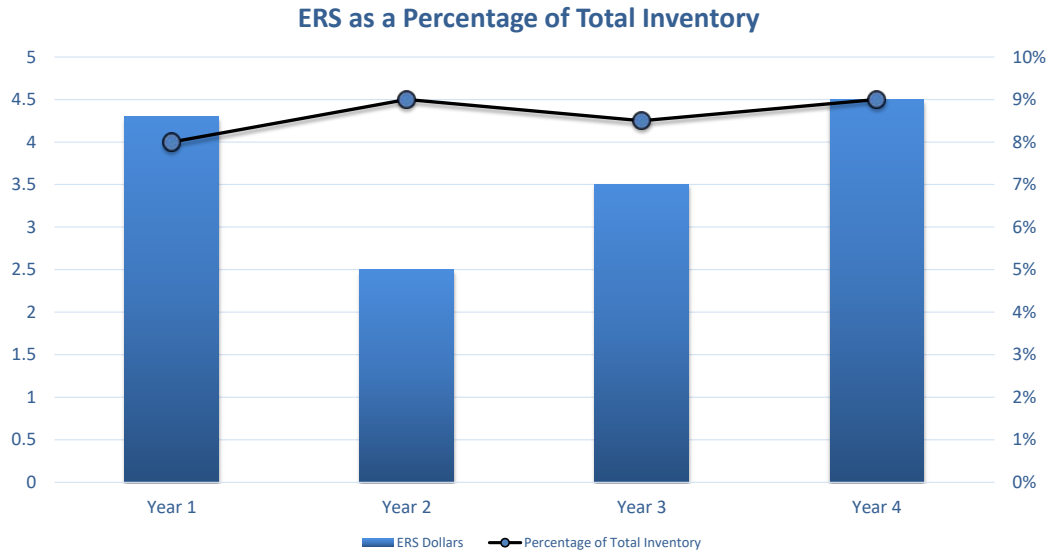
Use of the ERS as a Percentage of Total Inventory Metric

This metric measures the value of ERS relative to total inventory. The ERS for individual items is constrained by the economic retention limit (ERL), which is the maximum level of stock that is economical to retain. ERL is not a requirement, because it is not a level of stock that is procured or has a budget set for it.

Generally, ERS results when demand declines. As inventory requirements within the AAO decline, assets previously within the AAO become ERS. If demand is increasing, the opposite occurs and ERS becomes AAO stocks.

The increases or decreases in the ERS metric should reflect changes in customer demand. ERS changes that are contrary to customer demand trends should be investigated. The notional chart in Figure 66 shows how this metric is displayed.

Figure 66. Information Shown on ERS Percentage Graph



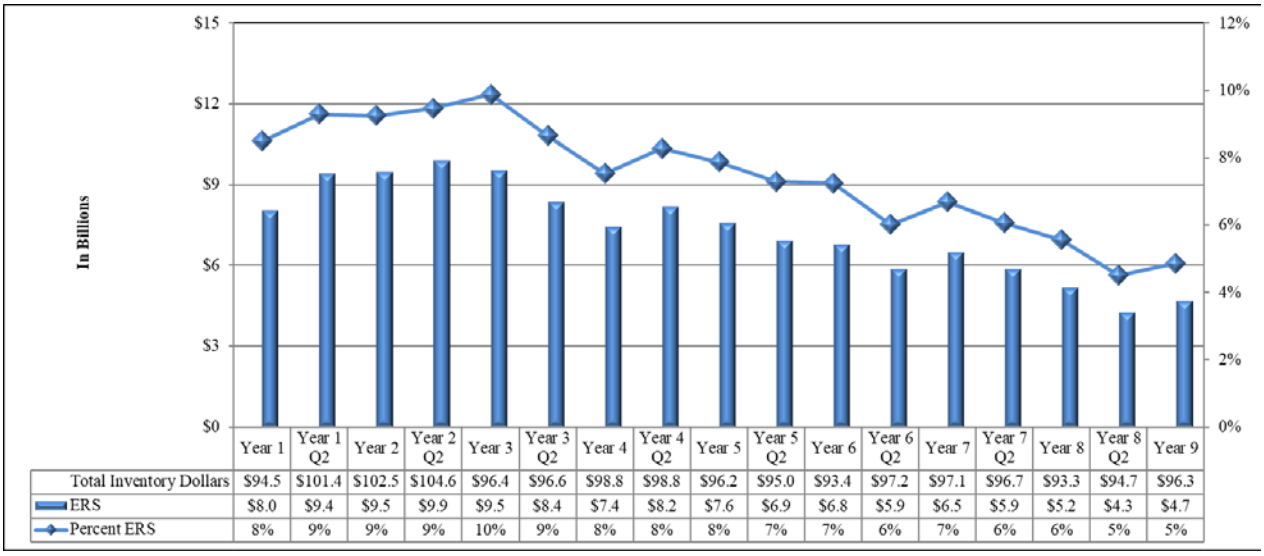
Development of the ERS as a Percentage of Total Inventory Metric

Sub-Plan	**D: Economic Retention:** Sizes the portion of the total inventory on-hand that is ERS.
External or Internal	**Internal:** Computed using data collected from military service and DLA materiel managers.

Description of the ERS as a Percentage of Total Inventory Metric

Definition	The percentage of total inventory value that is ERS.
Business Value	The objective of Sub-Plan D is to review and validate component methods to establish ERLs. This metric tracks how actions in support of this objective affect the amount of ERS in DoD wholesale supply.
Goals and Trend Analysis	**Goal:** Although there is no goal for this metric, the objective is to ensure DoD economic retention is monitored relative to changes in total inventory and inventory requirements. **Trend:** Efforts to reduce stocks that are not economical to retain should decrease this metric; however, the metric may increase as a result of declining demand that shifts AAO stocks to ERS.
Computation	Computed as the dollar value of ERS divided by the dollar value of total inventory.
OSD Data Requirements	**Frequency:** Semi-annual submission by the military services and DLA. **Content:** Dollar value of ERS and dollar value of total secondary item inventory.
General Display	The ERS value and percentage over time, broken out by DoD component. Figure 67 shows the general display for ERS as a percentage of total inventory (then-year dollars).

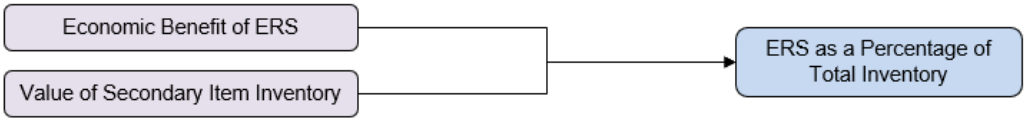
Figure 67. General Display for ERS as a Percentage of Total Inventory



	Year 1	Year 1 Q2	Year 2	Year 2 Q2	Year 3	Year 3 Q2	Year 4	Year 4 Q2	Year 5	Year 5 Q2	Year 6	Year 6 Q2	Year 7	Year 7 Q2	Year 8	Year 8 Q2	Year 9
Total Inventory Dollars	$94.5	$101.4	$102.5	$104.6	$96.4	$96.6	$98.8	$98.8	$96.2	$95.0	$93.4	$97.2	$97.1	$96.7	$93.3	$94.7	$96.3
ERS	$8.0	$9.4	$9.5	$9.9	$9.5	$8.4	$7.4	$8.2	$7.6	$6.9	$6.8	$5.9	$6.5	$5.9	$5.2	$4.3	$4.7
Percent ERS	8%	9%	9%	9%	10%	9%	8%	8%	8%	7%	7%	6%	7%	6%	6%	5%	5%

Relationships with Other Metrics

Key Relationships:



Economic Benefit of ERS	The principal objective of the economic benefit metric for ERS is to identify instances where the level of ERS for an item is not economical. The response should be a reduction in ERS for those instances. That, in turn, would reduce the ERS percentage.
Value of Secondary Item Inventory	The value of secondary item inventory has a direct bearing on the ERS percentage. If the value goes up and ERS stays the same, the percentage will get smaller. If the value goes down and ERS stays the same, the percentage will get larger. Of course, increases or decreases in the ERS itself may cause the percentage to increase or decrease respectively, unless the value of inventory also changes.

Economic Benefit of ERS

Use of the Economic Benefit of ERS Metric

This metric serves two purposes. The first is to validate that the level of ERS for an item is economical. Although policy calls for the use of an economic analysis model for setting ERLs, materiel managers may add inventory to ERS using criteria outside of the economic analysis. If those inventories are not economical, they will yield a benefit metric less than one. This is particularly true for items that have no predictable (or likely) demand to support economic retention.

The second purpose of this metric is to quantify the expected savings for every expected dollar spent to retain ERS. The value of the expected savings will decrease as the level of ERS grows. Above the ERL, the savings will be less than a dollar.

The table in Figure 68 shows how economic benefit metrics are captured. The objective is to minimize the number of items and ERS dollars, where savings are less than the cost of retaining ERS (i.e., the ratio is less than 1).

Figure 68. Information Shown in ERS Economic Benefit Table

Savings to Cost Ratio	Component	# of Items March	Value of ERS March (Millions)	Aggregate Ratio March
Less than one due to an uneconomical level of ERS	Army	408	$ 123	0.10
	Air Force	3,641	$ 974	0.00
	DLA	4,895	$ 16	0.11
	Navy	25,218	$ 1,369	0.01
	USMC	23	$ 43	0.96
	Total	34,185	$ 2,524	0.08
More than one due to an economical level of ERS	Army	4,590	$ 1,049	6.96
	Air Force	724	$ 344	17.93
	DLA	344,036	$ 2,133	11.59
	Navy	7,163	$ 499	10.24
	USMC	366	$ 102	1.41
	Total	356,879	$ 4,127	10.13

Development of the Economic Benefit of ERS Metric

Sub-Plan	**D: Economic Retention:** Quantifies the cost savings of retaining ERS.
External or Internal	**Internal:** Computed by military service and DLA materiel managers.

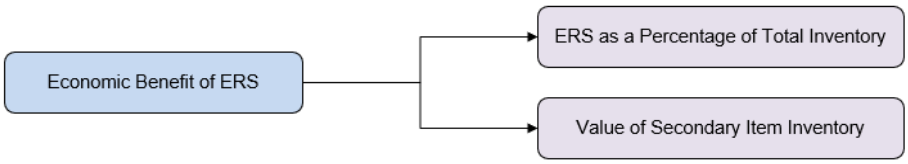
Description of the Economic Benefit of ERS Metric

Definition	The dollar savings for every dollar spent on retaining economic retention stock.
Business Value	The objective of Sub-Plan D is to review and validate component methods to establish ERLs. This metric • validates the economics of retaining ERS, and • can be used to ensure the ERS for a particular item is economical.
Goals and Trend Analysis	**Goal:** Greater than or equal to 1 for all items with ERS; thereby, verifying that it is economical to retain. **Trend:** The trend should be towards reducing the number of items with an ERS ratio less than 1.
Computation	The metric is the ratio of the expected savings over the expected costs where: • The expected savings are equal to the repurchase savings. Expected costs are the sum of the storage costs, the return for disposal of unserviceable ERS, and the repair cost that would be incurred if the item were used; • The expected costs are the sum of the storage costs, the return if disposed, and, for unserviceable ERS, the repair cost that would be incurred if repaired. The annual storage cost is normally 1–2% of the value of the ERS being stored; and • The period of costs is 10 years; storage cost rate (normally 1% to 2%); the current salvage value or return from disposal as a percentage of the value of the stock.

OSD Data Requirements	**Frequency:** Semi-annual submission by the military services and DLA. **Content:** The number of items, the ERS value, and the overall economic benefit for the following categories of items with ERS: 1. Items with a benefit equal to zero (indicating no demand to justify economic retention) 2. Items with a benefit less than 1 (indicating some or all of the ERS is uneconomical) 3. Items with a benefit greater than or equal to 1 4. All items with ERS.
General Display	The counts and values associated with the metric are displayed in a table that shows the item counts, ERS values. Figure 68 shows the general display for the ERS economic benefit metric.

Relationships with Other Metrics

Key Relationships:



ERS as a Percentage of Total Inventory	The principal objective of the economic benefit metric for ERS is to identify instances in which the level of ERS for an item is not economical. The response should be a reduction in ERS for those instances. That, in turn, would reduce the ERS percentage.
Value of Secondary Item Inventory	If the economic benefit metric for ERS causes a reduction in ERS, the value of secondary item inventory will reflect that reduction.

CRS as a Percentage of Total Inventory

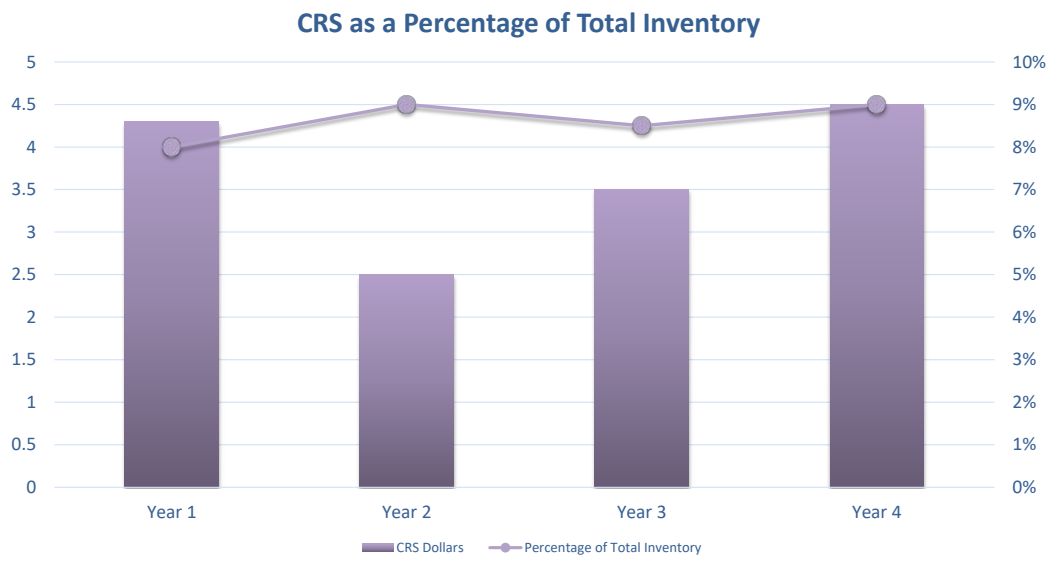
Use of the CRS as A Percentage of Total Inventory Metric

The CRS as a percentage of total inventory metric measures the value of CRS relative to total inventory.

A materiel manager determines the CRS for an individual item, but CRS must conform to one of the approved reasons listed in policy. CRS is not a requirement; that is, it is not a level of stock that is procured or has a budget. Generally, CRS results from declining demand, which causes inventory requirements within the AAO to decline, which, in turn, causes assets previously within the AAO to become ERS or CRS. If demand is increasing, the opposite occurs, and CRS is drawn into ERS or AAO stocks.

The increases or decreases in the CRS metric should reflect changes in customer demand. CRS changes that are contrary to customer demand trends should be investigated. The notional chart in Figure 69 shows how this metric is displayed.

Figure 69. Information Shown in CRS Percentage Graph



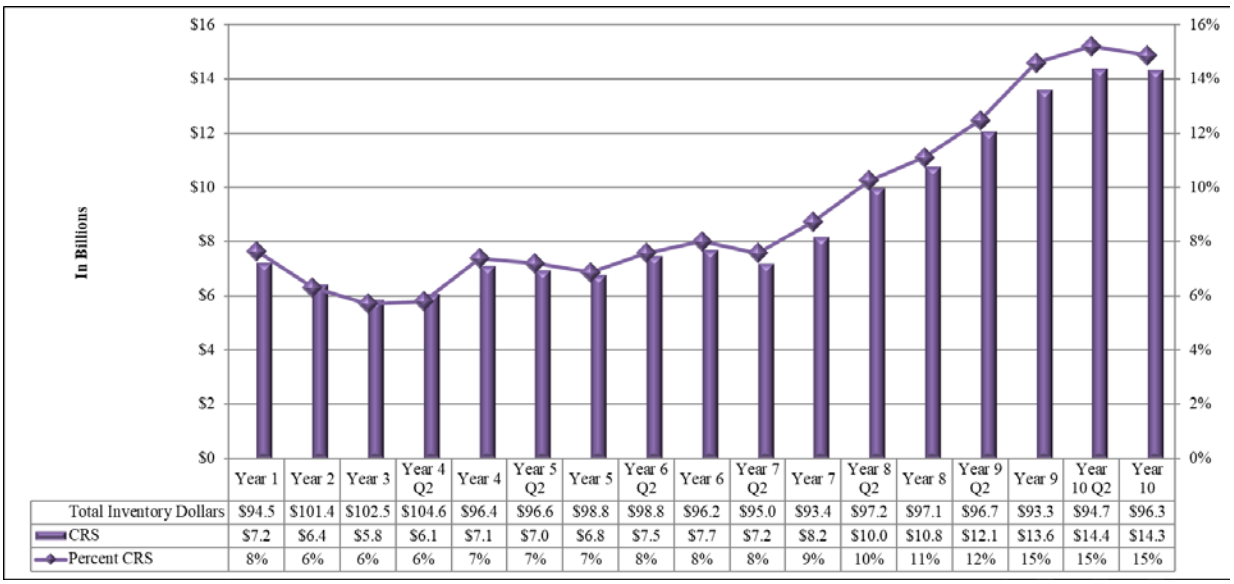
Development of the CRS as a Percentage of Total Inventory Metric

Sub-Plan	**E: Contingency Retention:** This metric sizes what portion of the total inventory on-hand is CRS.
External or Internal	**Internal:** Computed using data collected from military service and DLA materiel managers.

Description of the CRS as a Percentage of Total Inventory Metric

Definition	The percentage of total inventory value that is CRS.
Business Value	The objective of Sub-Plan E is to review and improve the justification for retaining contingency stock. This metric tracks how actions in support of this objective affect the amount of CRS in DoD wholesale supply.
Goals and Trend Analysis	**Goal:** Although there is no goal for this metric, the desired outcome is to ensure that DoD contingency retention is monitored relative to changes in total inventory and inventory requirements. **Trend:** Efforts to rid CRS of stock that is not associated with a contingency should decrease this metric, although the metric may increase because declining demand shifts AAO stocks to CRS.
Computation	The metric is computed as times the dollar value of CRS divided by the dollar value of total inventory.
OSD Data Requirements	**Frequency:** Semi-annual submission by the military services and DLA **Content:** Dollar value of CRS and dollar value of total secondary item inventory.
General Display	The CRS value and percentage over time with breakouts by DoD component. Figure 70 shows the general display for CRS as a percentage of total inventory (in then-year dollars).

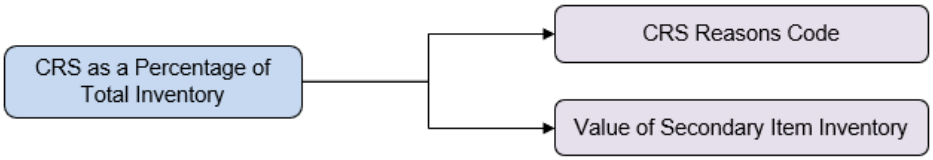
Figure 70. General Display for CRS as a Percentage of Total Inventory



	Year 1	Year 2	Year 3	Year 4 Q2	Year 4	Year 5 Q2	Year 5	Year 6 Q2	Year 6	Year 7 Q2	Year 7	Year 8 Q2	Year 8	Year 9 Q2	Year 9	Year 10 Q2	Year 10
Total Inventory Dollars	$94.5	$101.4	$102.5	$104.6	$96.4	$96.6	$98.8	$98.8	$96.2	$95.0	$93.4	$97.2	$97.1	$96.7	$93.3	$94.7	$96.3
CRS	$7.2	$6.4	$5.8	$6.1	$7.1	$7.0	$6.8	$7.5	$7.7	$7.2	$8.2	$10.0	$10.8	$12.1	$13.6	$14.4	$14.3
Percent CRS	8%	6%	6%	6%	7%	7%	7%	8%	8%	8%	9%	10%	11%	12%	15%	15%	15%

Relationships with Other Metrics

Key Relationships:



CRS Reason Codes	The principal objective of the CRS reason codes is to ensure all CRS is supported by a contingency-related reason. The lack of a reason code may cause CRS to be reduced. That, in turn, would reduce the CRS percentage.
Value of Secondary Item Inventory	The value of secondary item inventory has a direct bearing on the CRS percentage. If the value goes up and CRS stays the same, the percentage will decrease. If the value goes down and CRS stays the same, the percentage will increase. Of course, increases or decreases in CRS may cause the percentage to increase or decrease unless the value of inventory also changes.

CRS Reason Codes

Use of the CRS Reason Codes Metric

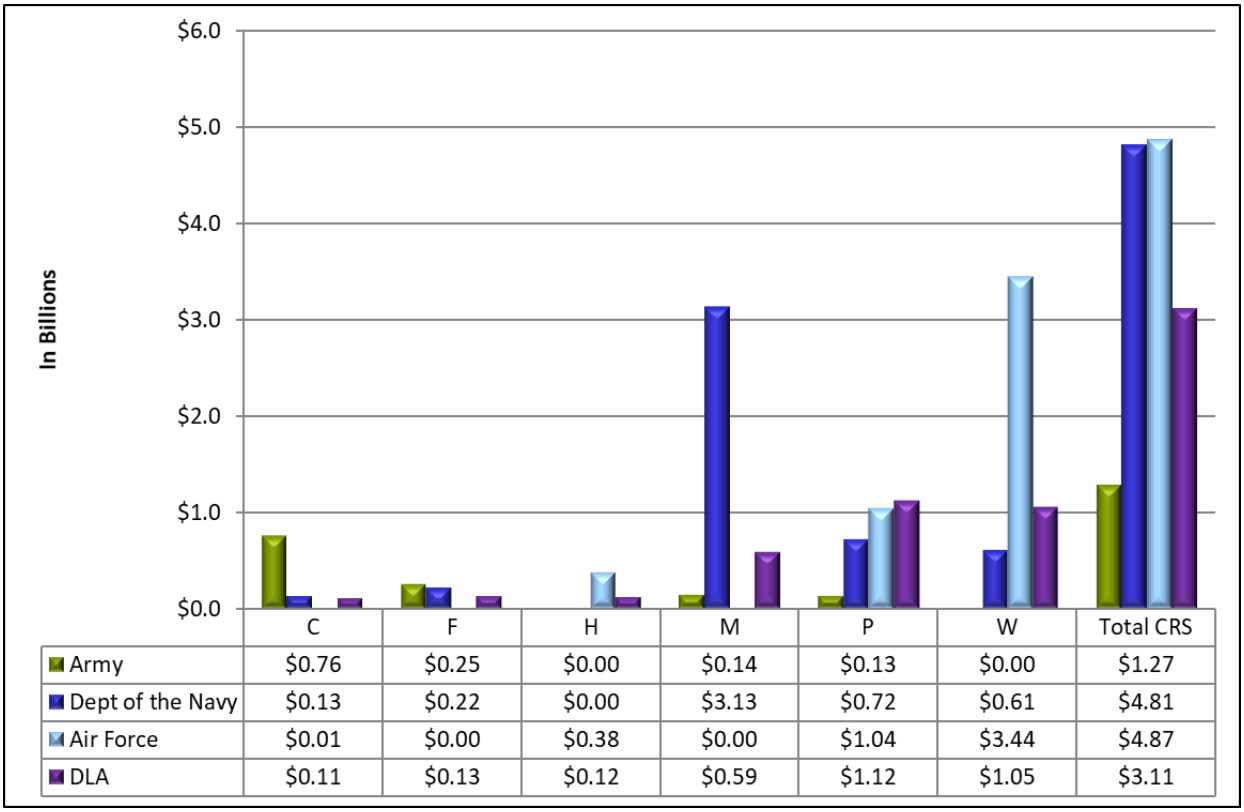
While the amount of CRS retained for an item is determined by its materiel manager, the rationale supporting that determination must be documented and conform to one of the approved CRS reason codes. The CRS reason code metric ensures CRS is managed and reported in accordance with those reason codes.

The six reason codes are as follows:

1. CRS code C: Reclamation and cannibalization.
2. CRS code F: Potential security assistance; foreign military sales reserve.
3. CRS code H: Humanitarian assistance and disaster relief, includes civil emergencies.
4. CRS code M: Military operational necessity.
5. CRS code P: Item procurement and re-procurement constrained, includes diminishing manufacturing source, life-of-type (LOT) buy, non-procurable stock, unforecastable demand, performance-based logistics items.
6. CRS code W: Weapon system exclusion includes weapon system modification programs, service life extension programs, and Weapon System Designator Code items.

Figure 71 shows how this metric is displayed.

Figure 71. Information Shown in CRS Reason Code Graph



	C	F	H	M	P	W	Total CRS
Army	$0.76	$0.25	$0.00	$0.14	$0.13	$0.00	$1.27
Dept of the Navy	$0.13	$0.22	$0.00	$3.13	$0.72	$0.61	$4.81
Air Force	$0.01	$0.00	$0.38	$0.00	$1.04	$3.44	$4.87
DLA	$0.11	$0.13	$0.12	$0.59	$1.12	$1.05	$3.11

Development of the CRS Reason Codes Metric

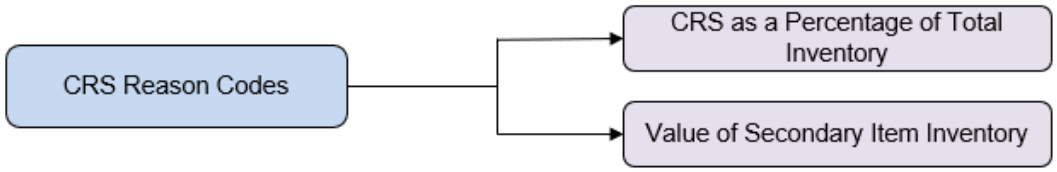
Sub-Plan	**E: Contingency Retention:** Quantifies the CRS investment by the reasons used to justify its retention.
External or Internal	**Internal:** Computed by military service and DLA materiel managers.

Description of the CRS Reason Codes Metric

Definition	The breakdown of CRS by authorized CRS reason codes.
Business Value	The objective of Sub-Plan E is to review and improve the justification for retaining contingency stock. This metric supports that objective by requiring components to categorize their CRS by the reason codes authorized in policy.
Goals and Trend Analysis	**Goal:** 100% of CRS is justified by an authorized reason code. **Trend:** If 100% of CRS items are not justified, the trend is a number of items with unjustified CRS.
Computation	The dollar values of CRS are summed by CRS reason code.
OSD Data Requirements	**Frequency:** Semi-annual submission by military services and DLA. **Content:** The dollar value of CRS by these reason codes.
General Display	The dollar value of CRS by reason code and DoD component. Figure 71 shows the general display for CRS reason codes.

Relationships with Other Metrics

Key Relationships:



CRS as a Percentage of Total Inventory	The principal objective of the CRS reason codes is to ensure all CRS is supported by a valid contingency retention reason. The lack of a valid retention decision that is supported by a reason code may cause CRS to be reduced. That, in turn, would reduce the CRS percentage.
Value of Secondary Item Inventory	If the CRS decreases due to a lack of valid retention decisions, the value of secondary item inventory will reflect that reduction.

Secondary Item Storage Costs–Distribution Depot

Use of the Secondary Item Storage Costs–Distribution Depot Metric

The secondary item storage costs–distribution depot metric tracks the costs of storing inventory within the DoD distribution depots and the cost of secondary item inventories managed by the military services and DLA.

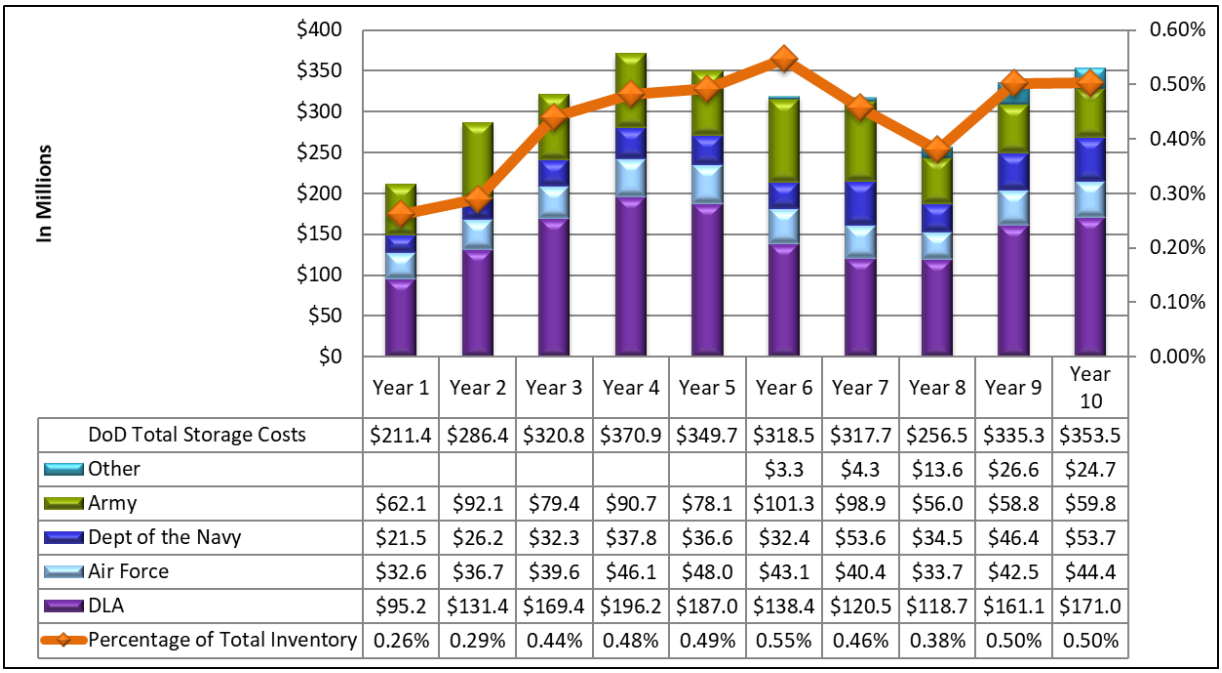
The costs of storage (along with the costs of receiving and issuing stocks) are charged to the military services and DLA to finance the DoD distribution depot mission. Storage costs plus obsolescence costs, cost of capital, and the cost of storage losses constitute DoD's holding costs for inventory.

When combined with the acquisition value of inventory stored in a distribution depot, secondary storage costs equate to the cost to store a dollar of inventory. That cost is used in decisions that set inventory levels. Increasing costs can reduce the amount of inventory purchased and ERS.

Undervalued storage costs may threaten the financial position of distribution depots. Overvalued costs may artificially reduce inventories, resulting in less cost-effective levels.

Figure 72 shows how this metric is displayed.

Figure 72. Information Shown in Storage Costs Graph



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
DoD Total Storage Costs	$211.4	$286.4	$320.8	$370.9	$349.7	$318.5	$317.7	$256.5	$335.3	$353.5
Other						$3.3	$4.3	$13.6	$26.6	$24.7
Army	$62.1	$92.1	$79.4	$90.7	$78.1	$101.3	$98.9	$56.0	$58.8	$59.8
Dept of the Navy	$21.5	$26.2	$32.3	$37.8	$36.6	$32.4	$53.6	$34.5	$46.4	$53.7
Air Force	$32.6	$36.7	$39.6	$46.1	$48.0	$43.1	$40.4	$33.7	$42.5	$44.4
DLA	$95.2	$131.4	$169.4	$196.2	$187.0	$138.4	$120.5	$118.7	$161.1	$171.0
Percentage of Total Inventory	0.26%	0.29%	0.44%	0.48%	0.49%	0.55%	0.46%	0.38%	0.50%	0.50%

Development of the Secondary Item Storage Costs—Distribution Depot Metric

Sub-Plan	**F: Storage and Direct Vendor Delivery:** Quantifies the annual storage costs that are incurred by the DoD distribution depots and charged to DoD component materiel managers.
External or Internal	**Internal:** Computed by DLA distribution managers.

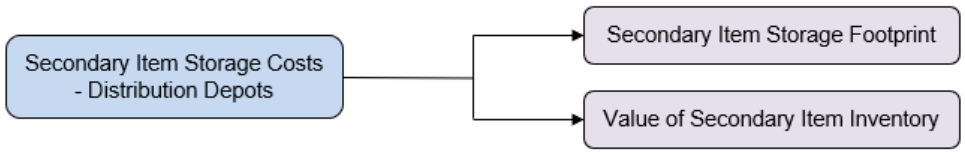
Description of the Secondary Item Storage Costs–Distribution Depot Metric

Definition	The costs charged to the military services and DLA for their secondary item inventory stored in DoD distribution depots.
Business Value	The objective of Sub-Plan F is to reduce storage space and associated storage costs wherever practicable. This metric tracks the costs of storing component inventories at DoD distribution depots.
Goals and Trend Analysis	**Goal:** Although no quantitative goal exists, the desired outcome is to lower storage costs through improved efficiency, if possible.

	Trend: As inventory goes down, storage costs should decrease, and vice versa.
Computation	DLA computes component storage costs as the sum of open, covered, and specialized storage costs, which are based on occupied cubic feet.
OSD Data Requirements	**Frequency:** Annually. **Content:** Total storage costs for individual military services and DLA.
General Display	Component storage costs are displayed over time. Figure 72 shows the general display for secondary item storage costs (for distribution depots).

Relationships with Other Metrics

Key Relationships:



Secondary Item Storage Footprint	Dividing secondary item storage costs for distribution depots by the secondary item storage footprint yields the cost of storage per cubic foot.
Value of Secondary Item Inventory	Dividing secondary item storage costs for distribution depots by the value of the secondary item inventory stored in distribution depots yields the storage cost as a percentage of inventory value.

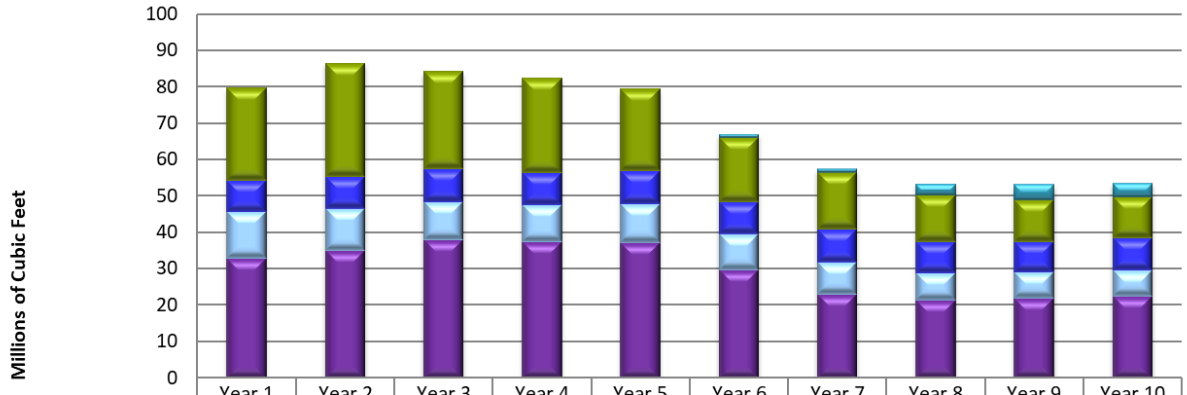
Secondary Item Storage Footprint

Use of the Secondary Item Storage Footprint Metric

The secondary item storage footprint metric tracks the storage footprint within the DoD distribution depots for secondary item inventories managed by the military services and DLA. It represents another way of measuring inventory growth (and decline), but it is not influenced by inflation.

When storage costs, are divided by the secondary item storage footprint metric the quotient is the cost per cubic foot of storage. Figure 73 shows how this metric is displayed.

Figure 73. Information Shown on Storage Footprint Graph



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
DoD Total	79.6	86.4	84.1	82.3	79.4	66.9	57.4	53.3	53.1	53.5
Other						1.0	1.0	3.1	4.2	3.7
Army	25.3	31.2	26.6	25.9	22.5	17.7	15.7	12.8	11.5	11.3
Dept of the Navy	8.7	8.7	9.1	8.8	9.1	8.8	9.0	8.6	8.4	8.9
Air Force	12.9	11.6	10.5	10.3	10.6	9.8	8.8	7.5	7.2	7.0
DLA	32.7	34.9	37.9	37.3	37.2	29.7	22.9	21.3	21.8	22.5

Development of the Secondary Item Storage Footprint Metric

Sub-Plan	**F: Storage and Direct Vendor Delivery:** Quantifies the DoD distribution depot storage footprint that is the basis for the storage costs charged to the DoD component materiel managers.
External or Internal	**Internal:** Computed by DLA distribution managers.

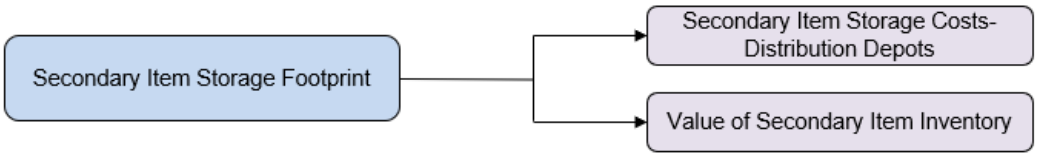
Description of the Secondary Item Storage Footprint Metric

Definition	The military services and DLA storage footprints for their secondary item inventory stored in DoD distribution depots given in cubic feet.
Business Value	The objective of Sub-Plan F is to reduce storage space and associated storage costs where practicable. This metric tracks the storage footprint of component inventories at DoD distribution depots.
Goals and Trend Analysis	**Goal:** Although no quantitative goal exists at this time, the desired outcome is to optimize the storage footprint relative to storage requirements to reduce storage costs. **Trend:** As inventory goes down, the storage footprint should decrease, and vice versa.
Computation	DLA calculates the storage footprint for each Component in terms of millions of cubic feet.
OSD Data Requirements	**Frequency:** Annually. **Content:** Total storage footprint for individual military services and DLA.

General Display	Component storage footprints are displayed over time. Figure 73 shows the general display for secondary item storage footprint.

Relationships with Other Metrics

Key Relationships:



Secondary Item Storage Costs – Distribution Depots	Dividing secondary item storage costs for distribution depots by the secondary item storage footprint yields the cost per cubic foot of storage.
Value of Secondary Item Inventory	The value of secondary item inventory is one way of measuring inventory growth or decline. However, the actual growth or decline may be a result of price changes. Matching changes in the value with changes in the storage footprint provides a more comprehensive picture of growth or decline.

Value of Inventory with 0–10+ Years of No Demand

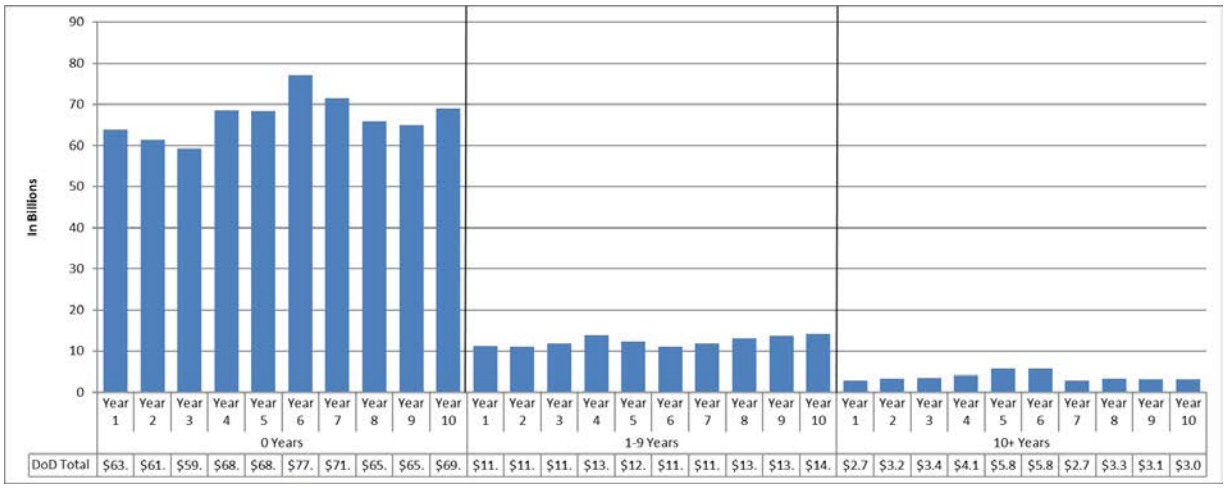
Use of the Value of Inventory with 0–10+ Years of No Demand Metric

This metric tracks the amount of secondary item inventory that is invested in items with years of no demand. It also shows the investment in inventory for items that were demanded within the last year.

Because inventory is generally held for sale or issue, the majority of inventory should have demands within a few years (a low number of years of no demand). If an item has had no demand in 10+ years, its stockage should be researched and be part of the metric that segments no-demand item inventory.

Figure 74 shows how this metric is displayed. Most inventory has had demand within 1 year (i.e., zero years of no demand).

Figure 74. Information Shown on 0–10+ Years with No Demand Graph



No Demand Items (0-10+ years)

Development of the Value of Inventory with 0–10+ Years of No Demand Metric

Sub-Plan	**G: Items with No Demand:** Quantifies the dollar amount of secondary inventory for an item that has had demand in the last year or • no demand in 0 years, • no demand in 1-9 years, • no demand in 10+ years.
External or Internal	**Internal:** Computed by the military service and DLA materiel managers.

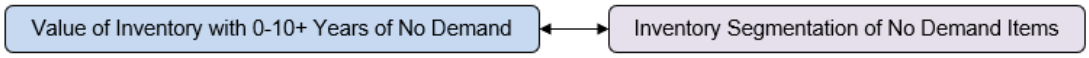
Description of the Value of Inventory with 0–10+ Years of No Demand Metric

Definition	Distribution of inventory dollars based on number of years of no demand for items with inventory.
Business Value	The objective of Sub-Plan G is to ensure items without demand in 5 or more years are not held in inventory unless there is justification. This metric shows how the inventory is distributed by years of no demand, and what portion relates to items without demand in 5 or more years.
Goals and Trend Analysis	**Goal:** Although there is no quantitative goal for this metric, the desired outcome is to reduce the inventory held for no-demand items. **Trend:** As inventory for items with years of no demand is reduced, the distribution should shift toward items with only a few years of no demand.

Computation	Items are divided by the years since their last demand. Zero indicates demand in last year, 10 or more indicates the item hasn't had demand in 10 or more years.
OSD Data Requirements	**Frequency:** Annually. **Content:** Three dollar values represent the three categories of years of no demand (0, 1-9, and 10+).
General Display	The annual distribution of inventory dollars by years of no demand is displayed. Figure 74 shows the general display for inventory dollars with 0–10+ years of no demand.

Relationships with Other Metrics

Key Relationships:



Inventory Segmentation of No Demand Items	While inventory value with 0–10+ years of no demand tells us how total inventory is distributed by years of no demand, inventory segmentation of no-demand items focuses on 5-9 years and 10+ years and how those categories are segmented into AAO, ERS, CRS, and PRS.

PRS Disposition

Use of the PRS Disposition Metric

This metric quantifies the review and disposition of potential reutilization stock. By definition, PRS is excess to AAO requirements and retention levels; however, before inventory is sent to disposal, it must be reviewed to ensure it is correctly identified as excess. The results of those reviews will either categorize the inventory as either AAO or retention stock or confirm that it is excess and should go to DLA Disposition Services.

Timely reviews are necessary to keep the level of potential excess down and not waste storage costs. Just as important, the reviews need to be conducted to ensure no inventory mistakenly identified as excess is sent to disposal.

When combined with the metric on the dollar value of PRS, this metric can be used to measure the PRS review effort. If the dollar value of PRS reviewed is small compared to the level of PRS, the level of effort should be increased.

Figure 75 shows the dollar value of PRS Disposition each year.

Figure 75. Information Shown in PRS Disposition Chart

September (Millions of Dollars)

	Custody Transferred to DRMS	DEMIL Issues Need Resolved	Restratified	Held for PICA	Open Disposals	On Army Inventory Reduction Plan	Delayed	Uneconomical	Incomplete	No Response	Data Issues	Returned to PICA
Army	312.29	497.70	1,217.30	0.35	432.10	955.80						
Navy	811.14		4,586.00	101.20					80.20			
Air Force	579.00	2.00	1,630.70		16.70						16.70	60.90
Marines	37.30		5.30									
DLA	77.27		187.60				18.20	0.80	0.90	268.90		
DOD	1,817.00	499.70	5,996.20	101.50	448.70	955.80	18.20	0.80	81.00	268.90	16.70	60.90

Development the of PRS Disposition Metric

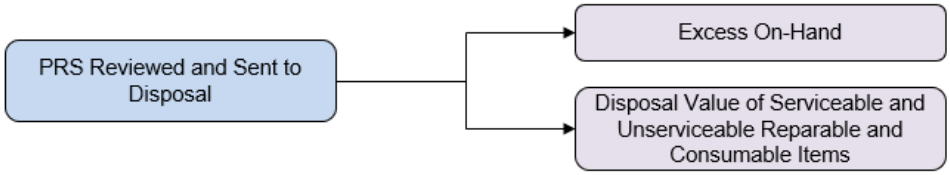
Sub-Plan	**H: Disposition of PRS:** Quantifies the dollar value of PRS that was reviewed and the dollar value of reviewed PRS that was sent to disposal.
External or Internal	**Internal:** Computed by military service and DLA materiel managers.

Description the of PRS Disposition Metric

Definition	The total dollar value of PRS that is reviewed for disposal compared to the total dollar value of PRS reviewed and sent to disposal.
Business Value	The objective of Sub-Plan H is to provide for the timely and effective review of PRS to ensure efficient disposal of excesses. This metric supports that objective by measuring the portion of PRS that is reviewed and sent to disposal.
Goals and Trend Analysis	**Goal:** Although there is no quantitative goal for this metric, the desired outcome is for faster retention and disposal decisions and actions. **Trend:** As improvements are made to the process of identifying and reviewing PRS (e.g., reductions in data errors), the percentage of PRS sent to disposal should increase.
Computation	The Components compute the required dollar value based on their records of reviews and the resulting disposition decisions. PRS is not discounted to disposal value.
OSD Data Requirements	**Frequency:** Annually. **Content:** The annual dollar value of PRS reviewed and custody transferred to DLA for disposition.
General Display	The dollar value of PRS reviewed and transferred to disposal is displayed by year. Figure 75 shows the general display for PRS reviewed and sent to disposal.

Relationships with Other Metrics

Key Relationships:



Excess On-Hand	Using excess on-hand dollars, the percentages of PRS reviewed and PRS reviewed and sent to disposal can be computed, as well as the turns for PRS.
Disposal Value of Serviceable and Unserviceable Reparable and Consumable Items	The portion of inventory sent to disposal that is not PRS reviewed can be determined by comparing the disposal value and the PRS value reviewed and sent to disposal. The portion of disposal value that is not associated with PRS review includes condemnations and retail excesses, ERS, and CRS sent directly to disposal.

Disposal Dollars for Reparable and Consumable Items

Use of the Disposal Dollars for Reparable and Consumable Items Metric

Serviceable and unserviceable reparable items and consumable items are disposed if they are excess to AAO requirements and retention levels. Serviceable reparable items can also be sent to disposal if the item is obsolete and has been replaced with another item, or if the item supported a weapon system that has been phased out. Unserviceable reparable items are disposed if they are condemned or if they are excess to AAO requirements and retention levels.

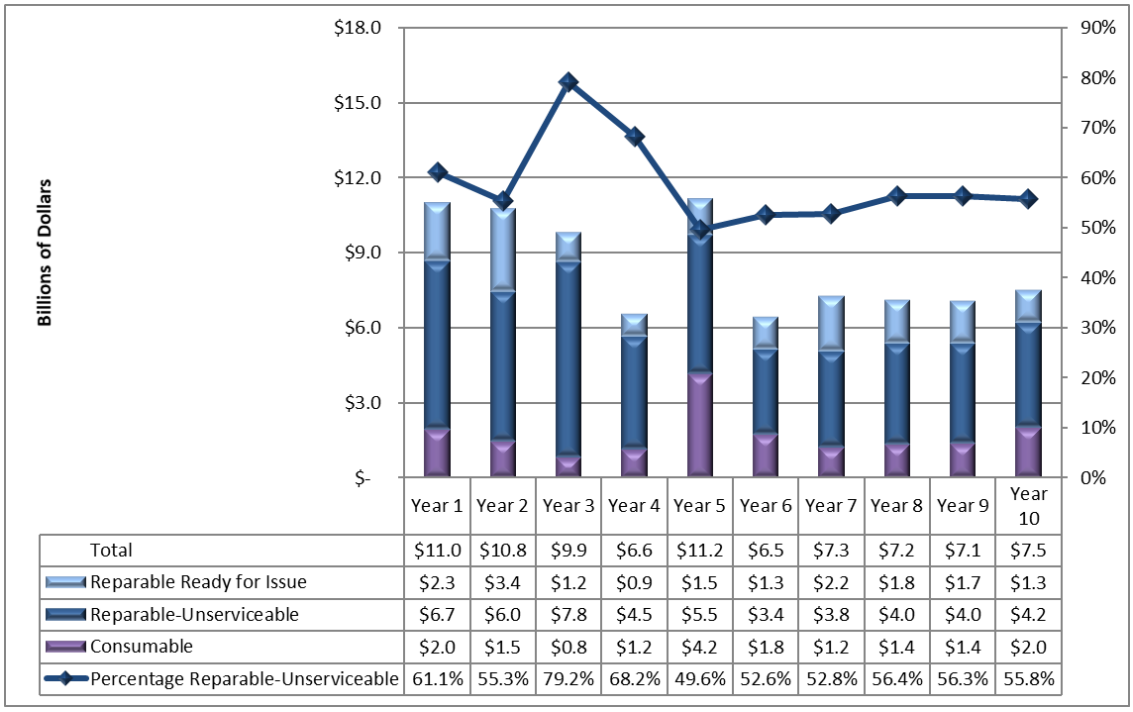
Although items are generally identified as PRS and then sent to DLA Disposition Services for disposal, AAO stocks and retention stocks can be sent to disposal if an AAO requirement or retention limit is reduced.

This metric captures all disposals, regardless of the reason. It can be used to determine if

- the level of the Department's investment in inventory is related to the level of inventory that is being disposed,
- consumable inventory purchases are resulting in a high level of stock that is never used, or
- more unserviceable reparable stocks are disposed than serviceable reparable stocks.

Figure 76 shows how this metric is displayed.

Figure 76. Information Shown in the Disposal Value Graph



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total	$11.0	$10.8	$9.9	$6.6	$11.2	$6.5	$7.3	$7.2	$7.1	$7.5
Reparable Ready for Issue	$2.3	$3.4	$1.2	$0.9	$1.5	$1.3	$2.2	$1.8	$1.7	$1.3
Reparable-Unserviceable	$6.7	$6.0	$7.8	$4.5	$5.5	$3.4	$3.8	$4.0	$4.0	$4.2
Consumable	$2.0	$1.5	$0.8	$1.2	$4.2	$1.8	$1.2	$1.4	$1.4	$2.0
Percentage Reparable-Unserviceable	61.1%	55.3%	79.2%	68.2%	49.6%	52.6%	52.8%	56.4%	56.3%	55.8%

Development of the Disposal Value of Serviceable and Unserviceable Reparable and Consumable Items Metric

Sub-Plan	**H: Disposition of PRS:** Quantifies the dollar values of different types and conditions of items sent to disposal.
External or Internal	**Internal:** Computed by military service and DLA materiel managers.

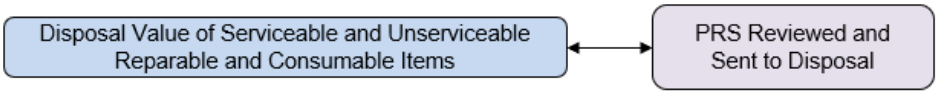
Description of the Disposal Value of Serviceable and Unserviceable Reparable and Consumable Items Metric

Definition	Inventory value sent to disposal that are • serviceable reparable assets, • unserviceable or condemned reparable assets (indicating at least one use), or • consumable assets.
Business Value	The objective of Sub-Plan H is to provide for the timely and effective review of PRS to ensure efficient disposal of excesses. This metric provides insight into what is being sent to DLA Disposition Services for disposal.
Goals and Trend Analysis	**Goal:** There are no quantitative goals for this metric. **Trend:** Current values are combined with historical values to identify any anomalies or trends.
Computation	The components compute the three required dollar values based on their records of reviews and disposal actions.

OSD Data Requirements	**Frequency:** Annually. **Content:** Consumable item, serviceable reparable item, unserviceable or condemned reparable item inventories that are sent to disposal.
General Display	The dollar values of the three categories of inventory sent to disposal are displayed by year, along with the percentage of unserviceable reparable item inventory sent to disposal. Figure 76 shows the general display for disposal value for serviceable and unserviceable reparable and consumable items.

Relationships with Other Metrics

Key Relationships:



PRS Reviewed and Sent to Disposal	The portion of inventory sent to disposal that is not PRS reviewed can be determined by comparing the disposal value and the value for PRS reviewed and sent to disposal. The portion of disposal value that is not associated with PRS review includes condemnations and retail excesses, ERS, and CRS sent directly to disposal.

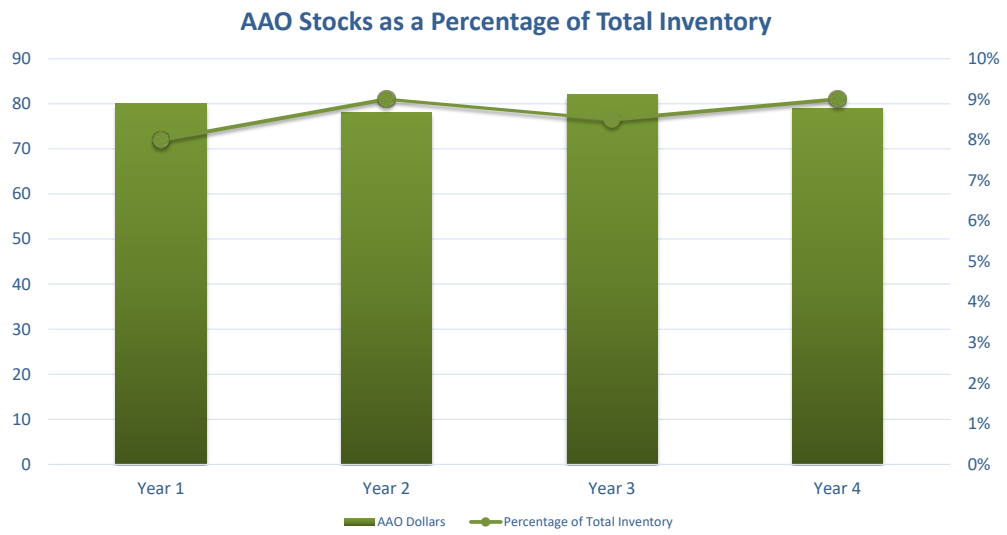
AAO Stocks as a Percentage of Total Inventory

Use of the AAO Stocks as a Percentage of Total Inventory Metric

The AAO stocks as a percentage of total inventory metric measures the value of AAO stock relative to total inventory. The requirements within the AAO are both demand- and non-demand-based. To the extent that demand-based requirements influence the overall AAO, increases and decreases in customer demand should be reflected in increases and decreases in AAO stock.

The notional chart in Figure 77 shows how this metric is displayed.

Figure 77. Information Shown in AAO Percentage Graph



Development of the AAO Stocks as a Percentage of Total Inventory Metric

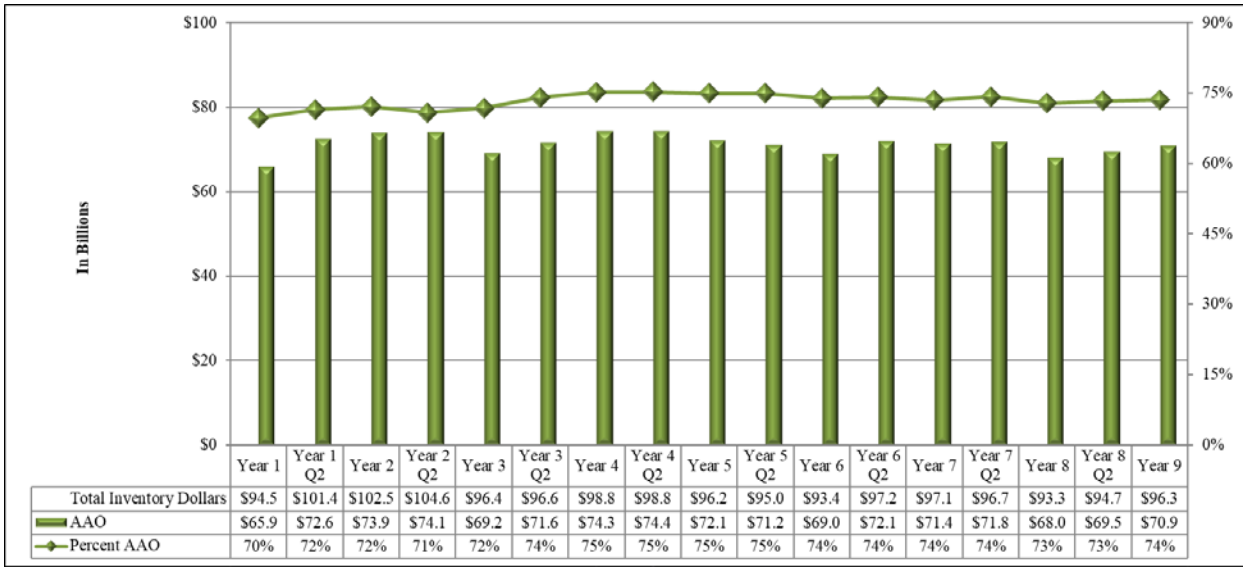
Sub-Plan	**I: Other Inventory Improvement Actions:** Sizes the portion of the total inventory on-hand that is within the AAO.
External or Internal	**Internal:** Computed using data collected from military service and DLA materiel managers.

Description of the AAO Stocks as a Percentage of Total Inventory Metric

Definition	The percentage of total inventory dollars that are within the AAO.
Business Value	The objective of Sub-Plan I is to make improvements to inventory management not specifically stated in Section 328 of the 2010 National Defense Authorization Act. Efforts to improve demand forecasting and requirements setting for non-forecastable items are two examples of improvements. The effect of such improvement efforts on the DoD inventory investment should be captured in this metric.
Goals and Trend Analysis	**Goal:** There is no goal for this metric. **Trend:** Efforts to right-size AAO requirements to effectively meet customer wartime and peacetime requirements should affect this metric, along with changes in customer demand.
Computation	Computed as dollar value of AAO stocks divided by the dollar value of total inventory.
OSD Data Requirements	**Frequency:** Semi-annual submission by military services and DLA. **Content:** Dollar value of AAO stocks and dollar value of total secondary item inventory.

General Display	The AAO percentage over time, with breakouts by DoD component. Figure 78 depicts the general display for AAO stocks as a percentage of total inventory.

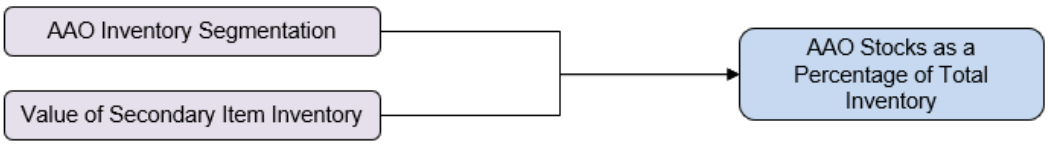
Figure 78. General Display for AAO Stocks as a Percentage of Inventory



	Year 1	Year 1 Q2	Year 2	Year 2 Q2	Year 3	Year 3 Q2	Year 4	Year 4 Q2	Year 5	Year 5 Q2	Year 6	Year 6 Q2	Year 7	Year 7 Q2	Year 8	Year 8 Q2	Year 9
Total Inventory Dollars	$94.5	$101.4	$102.5	$104.6	$96.4	$96.6	$98.8	$98.8	$96.2	$95.0	$93.4	$97.2	$97.1	$96.7	$93.3	$94.7	$96.3
AAO	$65.9	$72.6	$73.9	$74.1	$69.2	$71.6	$74.3	$74.4	$72.1	$71.2	$69.0	$72.1	$71.4	$71.8	$68.0	$69.5	$70.9
Percent AAO	70%	72%	72%	71%	72%	74%	75%	75%	75%	75%	74%	74%	74%	74%	73%	73%	74%

Relationships with Other Metrics

Key Relationships:



AAO Inventory Segmentation	The principal objective of the AAO inventory segmentation is to break AAO stocks out according to the requirements they support. While the percentage metric sizes AAO stocks, the segmentation metric drills down to the content of the AAO for items or groups of items.
Value of Secondary Item Inventory	The value of secondary item inventory has a direct bearing on the AAO percentage. If the value of secondary item inventory goes up and AAO stock stays the same, the percentage will get smaller. If the value goes down and AAO stock stays the same, the percentage will get larger. Of course, increases or decreases in the AAO stock may cause the percentage to increase or decrease, unless the value of inventory also changes.

AAO Inventory Segmentation

Use of the AAO Inventory Segmentation Metric

The AAO stock for an individual item is the sum of the assets against the requirements that are applicable to that item. Some components consider AAO to be synonymous to the budget horizon; that is, when assets are applied against the requirements within the AAO, the results are the current deficits that need to be included when preparing their WCF budget. (Note that stock levels above AAO are not part of their budgets.)

The applicability of each AAO requirement is as follows:

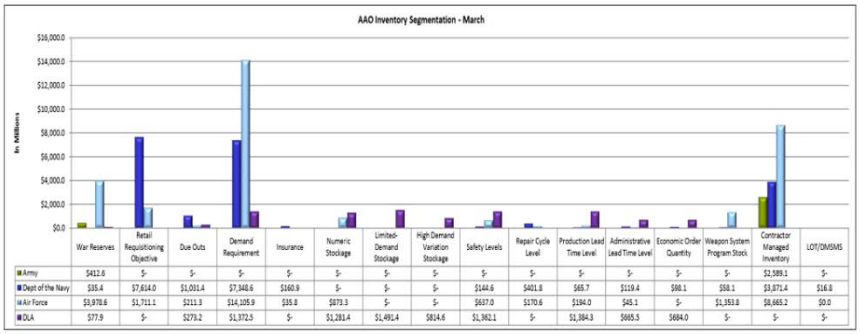
- War reserves only apply to items that require additional stock to transition from peacetime to wartime operating levels and to support initial theater opening.
- Only items stocked at retail supply activities should have retail requisitioning objectives.
- Only items with backorders should have stock due-outs.
- The requirement for a non-forecastable item falls into one of four requirements:
    - Insurance stockage (stockage of a minimum replacement unit to guard against unpredictable, but catastrophic demand)
    - Numeric stockage (stockage of up to two minimum replacement units for items with insufficient demand to use a forecasting model)
    - Limited demand stockage (max./min. stockage for items with intermittent demand that does not provide the basis for a creditable forecast from a statistical model)
    - High demand variation stockage (max/min stockage for items with demand that is too variable to provide the basis for a creditable forecast from a statistical model).
- A forecastable item has the following requirements:
    - Safety level
    - Repair cycle level (for reparable items only, forecasted demand over the item's repair cycle time)
    - PLT level (forecasted demand over the item's PLT)
    - ALT level (forecasted demand over the item's ALT)
    - Procurement cycle or economic order quantity (amount or quantity to be routinely procured).
- Although the provisioning of stocks in support of a weapon system are captured in the above requirements, any weapon system support stock not captured in provisioning requirements should be reported as weapon system program stock.
- Items whose inventory is owned by the government but are managed by a contractor should be reported as contractor-managed inventory.
- LOT buy quantities fall within the AAO, but only apply to on-order stock.

The breakout of AAO stocks provides a full profile of inventory that is held for wartime and peacetime requirements. It also segments AAO stocks into those stocks associated with

forecastable items and those stocks associated with non-forecastable items. For forecastable items, forecast accuracy and bias provide some measure of the probable use of their segments.

Figure 79 shows how this metric is displayed.

Figure 79. Information Shown in AAO Segmentation Graph



	War Reserves	Retail Requisitioning Objective	Due Outs	Demand Requirement	Insurance	Numeric Stockage	Limited-Demand Stockage	High Demand Variation Stockage	Safety Levels	Repair Cycle Level	Production Lead Time Level	Administrative Lead Time Level	Economic Order Quantity	Weapon System Program Stock	Contractor Managed Inventory	LOT/DMSMS
Army	$412.6	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-	$2,589.1	$-
Dept of the Navy	$35.4	$7,614.0	$1,001.4	$7,348.6	$160.9	$-	$-	$-	$144.6	$401.8	$65.7	$119.4	$88.1	$58.1	$3,871.4	$16.8
Air Force	$3,978.6	$1,711.1	$211.3	$14,105.9	$35.8	$873.3	$-	$-	$637.0	$170.6	$194.0	$45.1	$-	$1,353.8	$8,665.2	$0.0
DLA	$77.9	$-	$273.2	$1,372.5	$-	$1,281.4	$1,491.4	$814.6	$1,362.1	$-	$1,384.3	$665.5	$684.0	$-	$-	$-

Development of the AAO Inventory Segmentation Metric

Sub-Plan	**I: Other Inventory Improvement Actions:** Quantifies the inventory investment in each of the authorized AAO levels.
External or Internal	**Internal:** Computed by military service and DLA materiel managers.

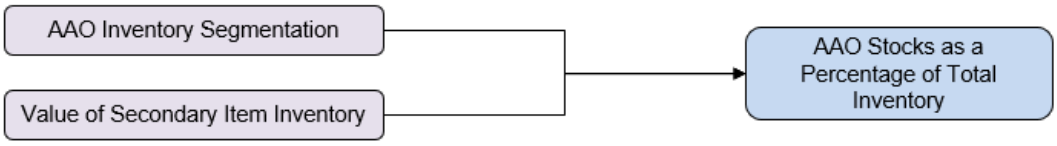
Description of the AAO Inventory Segmentation Metric

Definition	The breakdown of AAO stocks by authorized requirements.
Business Value	The objective of Sub-Plan I is to make other improvements to inventory management not specifically stated in Section 328 of the 2010 National Defense Authorization Act. Efforts to improve demand forecasting and improve requirements setting for non-forecastable items are two examples of those improvements. The effect of such improvement efforts on specific AAO requirements should be captured in this metric.
Goals and Trend Analysis	**Goal:** 100% of stock portrayed as AAO stock accurately assigned to an authorized AAO requirement. **Trend:** Requirements based on demand forecasts should trend in the same direction as demand is trending.
Computation	The dollar values of AAO stocks are summed by authorized requirements.

OSD Data Requirements	**Frequency:** Semi-annual submission by the military services and DLA. **Content:** The dollar value of AAO stocks by these requirements: • War reserves • Retail requisitioning objective • Stock due out • Demand • Insurance stockage • Numeric stockage • Limited demand stockage • High demand variation stockage • Safety level • Repair cycle level • PLT level • ALT level • Procurement cycle/economic order quantity • Weapon system program stock • Contractor-managed stock level.
General Display	The dollar value of AAO stock by requirement and DoD component. Figure 79 shows the general display for AAO inventory segmentation.

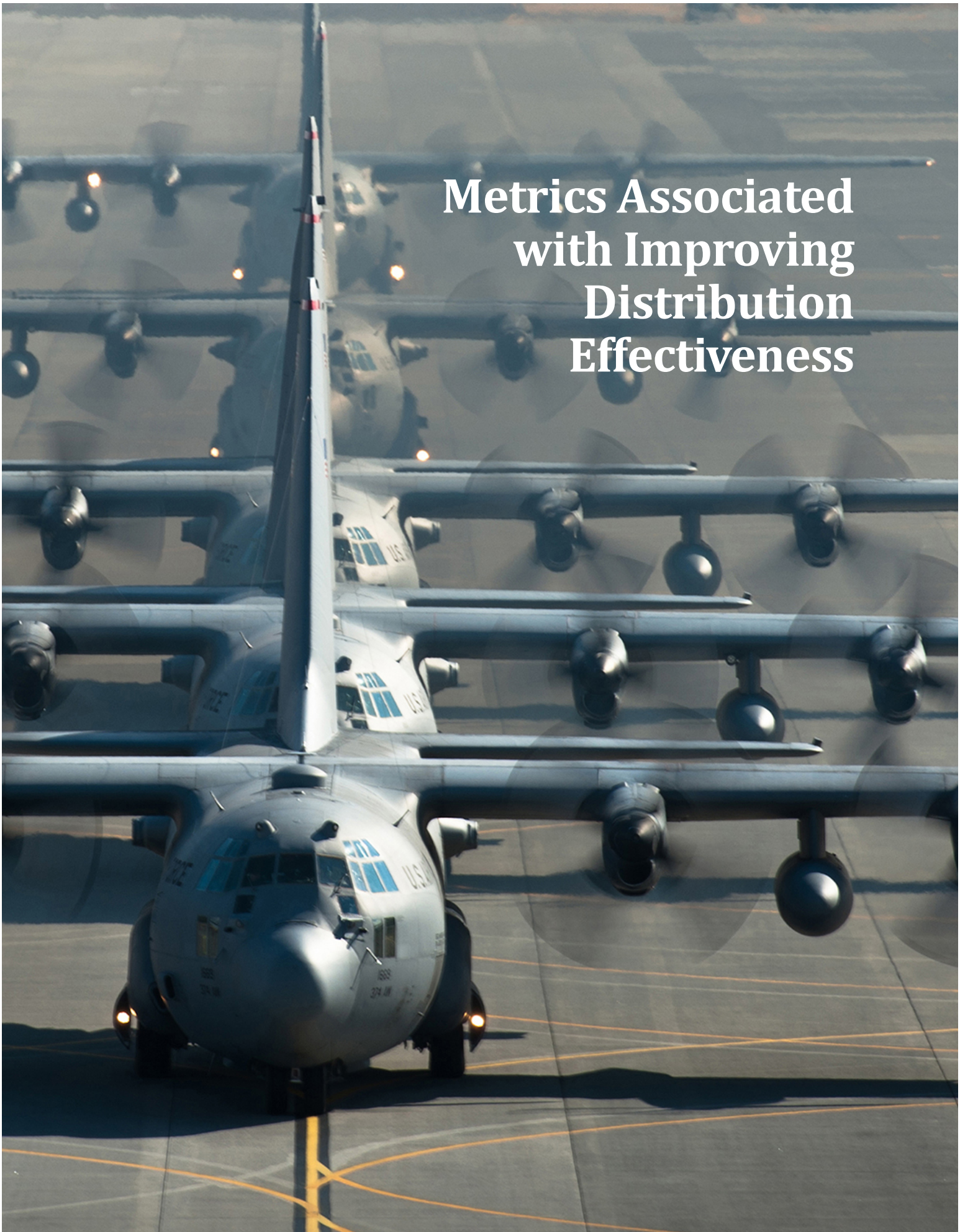
Relationships with Other Metrics

Key Relationships:



Demand Forecast Accuracy and Bias	Knowing demand forecast accuracy and bias provides a quantitative means for judging the accuracy of AAO levels associated with forecastable items.
Procurement Lead Time Variance	Knowing procurement lead time variances for production and ALTs provides a quantitative means for judging the accuracy of AAO lead time requirements levels.

Metrics Associated with Improving Distribution Effectiveness



Metrics Associated with Improving Distribution Effectiveness

This section of the DoD Supply Chain Metrics Guide contains detailed information on distribution management functional metrics. That information includes the comprehensive description of each metric and instructions on how the metric is measured and how it should be used. Charts showing measurements over time are included to help interpret the performance of each metric. Several of the distribution metrics resemble established enterprise metrics or inventory management metrics. While similar, these metrics are not identical because they are centered on DLA-managed items, which account for the bulk of materiel shipments within the DoD supply chain.

As noted earlier, the success of inventory management improvement efforts cannot be determined by a single metric. The same is true in measuring the success of distribution management improvement efforts.

A comprehensive assessment of DoD distribution management performance requires a review of all of the enterprise level metrics and the distribution management functional metrics in this Guide and their interrelationships. In some cases, performance cannot be determined by looking at the metric itself; it must be assessed in concert with the performance of other related metrics. In such cases, the related metrics are provided for review in conjunction with the targeted metric.

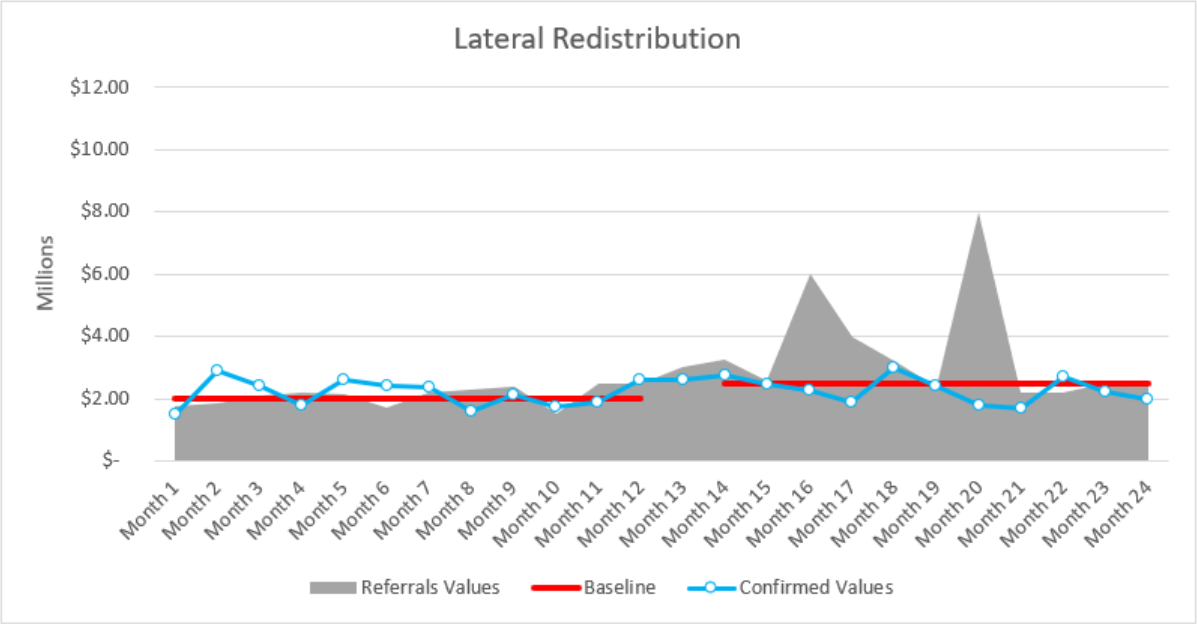
Lateral Redistribution

Use of the Lateral Redistribution Metric

The lateral redistribution metric is a measure of the dollar value of backorders filled by lateral redistribution. As such, it is a measure of success for the DLA ISV initiative.

Figure 80 shows how the monthly and annual dollar value of backorders filled through ISV are displayed. Because lateral redistribution is a function of the available amount of retail stock surplus to requirements, it can increase if surplus stocks increase, or it can decline if those surplus stocks decline.

Figure 80. Information Shown in Lateral Redistribution Graph



Development of the Lateral Redistribution Metric

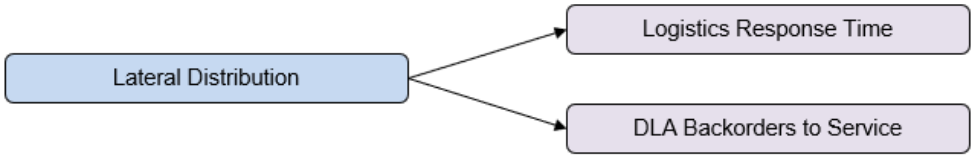
Attribute	**Cost and Responsiveness:** Effective use of retail stock surplus to requirements can decrease DLA inventory costs, while providing more responsiveness support to customers.
External or Internal	**Internal:** The value of ISV-filled backorders is captured by DLA.

Description of the Lateral Redistribution Metric

Definition	The dollar value of service-owned excess materiel redistributed to DLA to fill materiel requests or requisitions and prevent backorders.
Business Value	Lateral redistribution offers a cost-effective reutilization of DLA-managed but service-owned excess consumable inventories to reduce backorders.
Goals and Objective	The ongoing goal of ISV is to reduce backorders by cost-effectively reutilizing and redistributing service-owned consumable excess materiel to fill DLA material requests or requisitions.
Computation	Data is pulled from the DLA Total Asset Visibility system.
OSD Data Requirements	**Frequency:** Monthly. **Content:** Compiled by DLA.
General Display	Dollars reported by month and year. Figure 80 shows the general display for lateral redistribution.

Relationships with Other Metrics

Key Relationships:



Logistics Response Time	Lateral redistribution fills outstanding backorders and, consequently, reduces the LRT for those backorders.
DLA Backorders to Services	Lateral redistribution reduces the number of outstanding backorders.

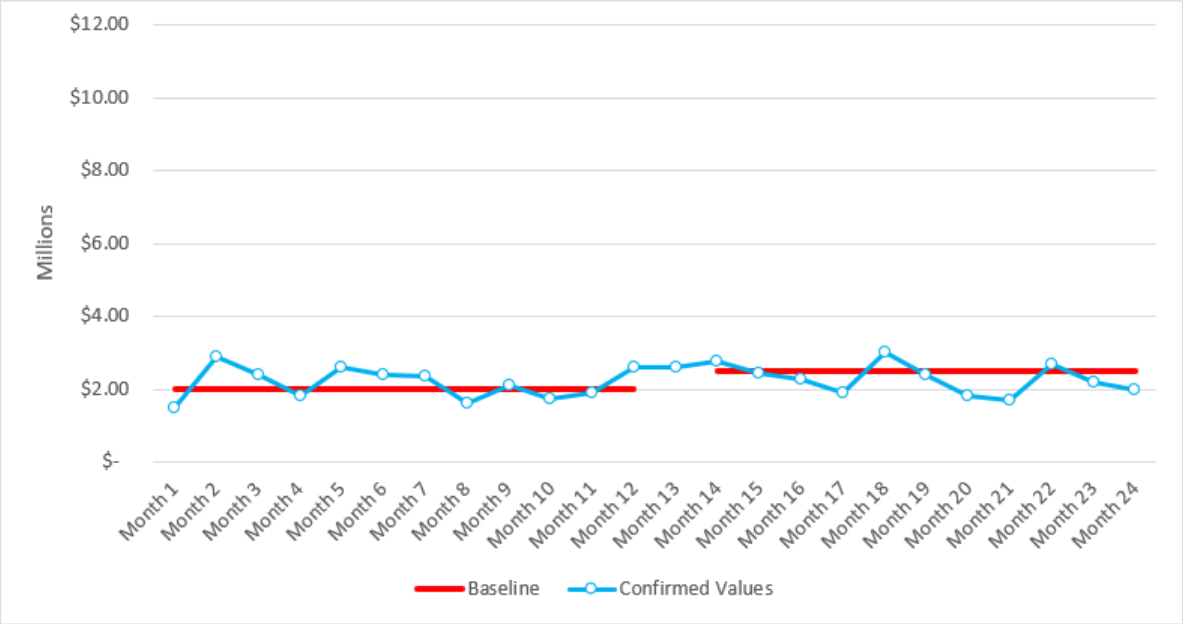
Procurement Offset

Use of the Procurement Offset Metric

The procurement offset metric is another ISV measure of success. It measures the dollar value of retail excesses that are used to offset wholesale procurements.

Figure 81 shows how the metric is displayed. The chart shows how offsets increased when the Air Force joined the ISV program. Because procurement offsets are a function of the available amount of retail stock surplus to requirements, it can increase if those surplus stocks increase or it can decline if those surplus stocks decline.

Figure 81. Information Shown in Procurement Offset Graph



Development of the Procurement Offset Metric

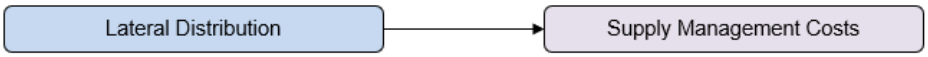
Attribute	**Cost and Responsiveness:** Effective use of retail stocks surplus to requirements can decrease DLA procurement costs.
External or Internal	**Internal:** The value of ISV-sourced procurement offsets is captured by DLA.

Description of the Procurement Offset Metric

Definition	The dollar value of assets that have been procured by DLA from one of the military services to fill a planned buy (in lieu of a contract with a vendor).
Business Value	Procurement offsets provide a cost-effective re-utilization of service-owned material to fill DLA planned buys and prevent new contracts.
Goals and Objective	An ongoing goal of ISV is to offset DLA procurements and prevent new contracts, while reducing service-owned excess.
Computation	Data is pulled from the DLA Total Asset Visibility system.
OSD Data Requirements	**Frequency:** Monthly. **Content:** Compiled by DLA.
General Display	Dollars reported by month and year. Figure 81 shows the general display for procurement offset.

Relationships with Other Metrics

Key Relationships:



Supply Management Costs	Because procurement offsets reduce the amount of stock procured, they reduce materiel obligation costs. Because procurement offsets may reduce the number of procurements, they could also reduce the overhead costs associated with procurement actions.

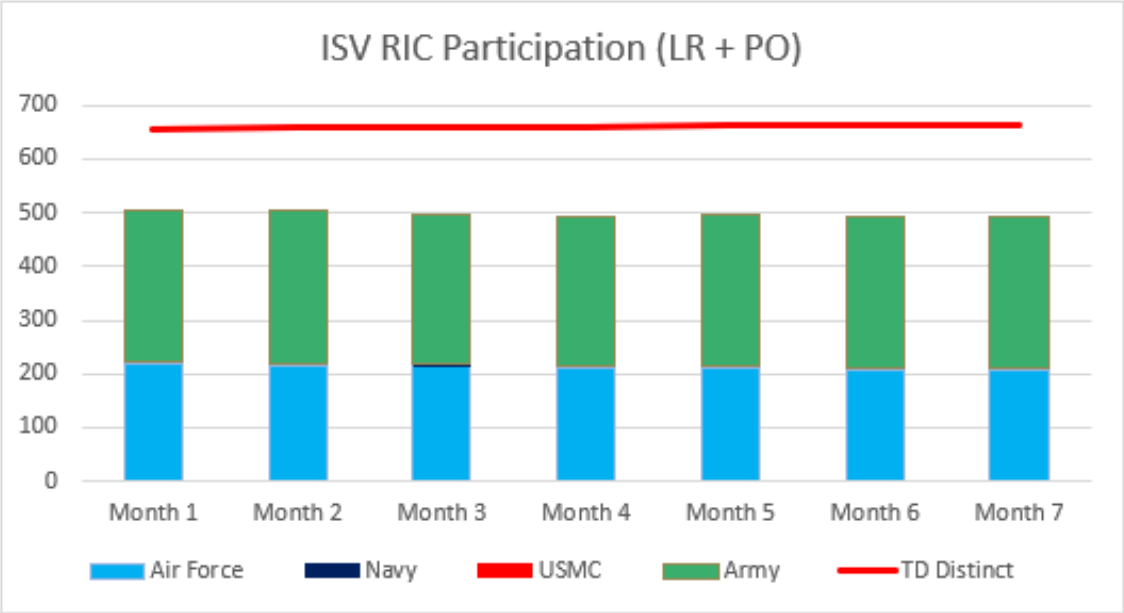
Routing Identifier Code (RIC) Participation

Use of the RIC Participation Metric

RIC participation is a measure of how many retail activities (identified by their RIC) participate in the ISV program.

Figure 82 shows how the metric is displayed.

Figure 82. Information Shown in RIC Participation Graph



Development of the RIC Participation Metric

Attribute	**Cost and Responsiveness:** Effective use of retail stocks surplus to requirements can decrease DLA procurement costs and improve its responsiveness.
External or Internal	**Internal:** The number of participating retail activities is captured by DLA.

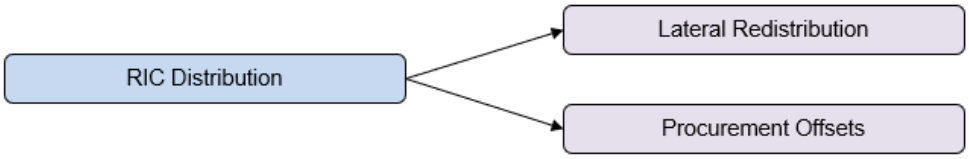
Description of the RIC Participation Metric

Definition	A total count of distinct RICs the military services have indicated are eligible to participate in ISV and respond to requests, either through lateral redistribution or procurement offset, according to business rules set forth by each service.
Business Value	Focusing on the number of retail activities participating in ISV will help maximize the number of RICs and enable efficient reutilization of service-owned, DLA-managed materiel to fill backorders and offset procurements.
Goals and Objective	An objective of ISV is active involvement by the military services and participation by all eligible RICs.
Computation	Data is pulled from the DLA Total Asset Visibility system.

OSD Data Requirements	**Frequency:** Monthly. **Content:** Compiled by DLA.
General Display	Number reported by month and military service. Figure 82shows the general display for RIC participation.

Relationships with Other Metrics

Key Relationships:



Lateral Redistribution	Lateral redistribution is a function of the number of retail activities participating in the ISV program. The higher that number, the greater the possibility that more retail surplus stock will be available for lateral redistribution.
Procurement Offset	Procurement offset are a function of the number of retail activities participating in the ISV program. The higher that number, the greater the possibility that more retail surplus stock will be available for procurement offsets.

Appendix A. Criteria 2 and 3 for Selection of Enterprise Metrics

Criterion 2. Metrics and Supply Processes

Metric	4140 Policy Process	Specific Procedures and Organizational Elements	Rationale
Demand forecast accuracy and bias	Planning	Demand planning done by ICPs and suppliers	Forecasts are the basis for most materiel management decisions. Measuring and improving the accuracy of those forecasts support good materiel management and better allocation of resources.
Procurement lead time	Make / Maintain	ICP supply planning and measurement of resupply times	Timely delivery of procured materiel according to plan is essential to filling customer demand. Measuring and reducing the time to delivery are key to good materiel management and meeting customers need dates, while considering supply chain (management) costs.
Procurement lead time variance	Make / Maintain	ICP supply planning and measurement of variability in resupply times	Timely delivery of procured materiel according to plan is essential to filling customer demand. Measuring and reducing the time to delivery materiel are key to good materiel management and meeting customers need dates while considering supply chain (management) costs.
Unserviceable DLR return times and over-aged due-ins	Return	ICP supply planning and the customer return process	Timely return of materiel in need of return is essential to scheduling and inducting repairs needed to fill demand. Measuring and controlling the time to return unserviceable items supports good materiel management.
Customer wait time	Delivery	Order fulfillment by retail supply activities supporting weapon system maintainers.	The time to provide replacements for items that have failed is the basis for supporting weapon system readiness. Measuring and controlling that time is key to sustaining weapon system readiness.
Perfect order fulfillment	Delivery	Order fulfillment by DoD suppliers to retail supply activities	Timely, accurate, and quality delivery of order materiel are essential to retail supply activities filling warfighter demand. Tracking if deliveries are on-time, in the right quantities, and in the right condition is important.
Fill rate	Delivery	Order fulfillment by DoD suppliers to retail supply activities	An immediate issue means that the DoD supplier was able to fill the customer's requisition with on-hand inventory. Fill rate measures the percentage of time that happens for stocked items.
Tiered inventory turn	Planning & Financial	Financial assessment of level setting by DoD suppliers	It is standard commercial practice to measure the number of times that inventory turns. Suppliers use this metric to determine if they are stocking items that sell. By focusing on demand-based, serviceable inventories, DoD suppliers can also judge if they are stocking the right quantities of the right items. Only forecastable items have demand-based, serviceable inventories.

Metric	4140 Policy Process	Specific Procedures and Organizational Elements	Rationale
Excess on-hand inventory	Planning & Financial	Requirements determination and disposal reviews by DoD suppliers	On-hand inventory stratified as serviceable and unserviceable excess indicates how well DoD suppliers are managing their inventories. A low percentage of excess inventory and prompt disposal reviews are signs of good management.
Due-in long supply	Planning, Sourcing & Financial	Contracting by DoD suppliers and contract termination actions	On-order inventory stratified as long supply indicates that the DoD suppliers are buying inventory that will not be needed in the short-term when delivered. A low percentage of on-order excess and prompt contract termination actions are signs of good management.
Denial rates	Delivery & Asset Visibility	Warehouse issuing of stock for delivery	Good warehouse management and stock control translates to issues of stored materiel without delay; whereas warehouse denials result in delays. Maintaining low denial rates is key to good warehouse management.
Non-mission capable rates	Planning	Level setting for weapon system items by DoD suppliers	A key indicator of how well the DoD supply chain supports operating forces is the readiness rates of weapons systems. Lack of success is measured by the percentage of time systems are not able to perform their mission due to materiel shortages.
NMCS/ CASREP/MICAP backorders	Sourcing	Backorder expediting by DoD suppliers	Materiel shortages cannot only down a weapon system but extended time on backorder will extend the time the weapon system is not able to perform. Expediting the satisfaction of NMCS/ CASREP/MICAP backorders reduces that time.
Value of inventory	Planning & Financial	Level setting, retention limits, and disposal reviews by DoD suppliers	DoD materiel managers invest in inventory to provide a rapid response to customer materiel orders. Knowing the size of that investment and how it segmented and the reasons for stockage of materiel helps to improve overall inventory management.
Log cost baseline	Planning & Financial	Sizing logistics costs to the customer	Each year, DoD units are given operating and maintenance funding to pay for their logistics needs. Tracking the annual costs of the three major logistics functions—maintenance, supply, and transportation—is part of monitoring those costs.
Supply management costs	All	All WCF costs associated with acquiring materiel and managing.	To know if the DoD supply chain is cost effective, the total cost of the chain must be collected. Many of the sub-costs for processes performed by individual organizations are captured, aggregated, and paid for in the surcharges (or cost recovery rates) that those organizations charge to their customers. Managing supply chain costs assists in maintaining customers' (war fighters) buying power.

Criterion 3. Desired Behaviors and Metrics

Supply Chain Objective	Desired Behavior	Metric – How It Supports Desired Behavior
Forecasting demand	Work toward more accurate forecasts to drive fewer excesses and better supply support.	**Forecast accuracy:** Provides a baseline for improvement and focuses management attention on more accurate forecasts.
Acquiring materiel	Work toward shorter supply chain cycle times to reduce inventory and provide a more agile supply system.	**Procurement lead time variance, Repair Cycle Time, and unserviceable return time:** Provide baselines for improving cycle times for three major sources of resupply and focus management attention on reducing those times.
Managing materiel	Work toward right-sizing and improving the productivity of DoD inventories, while maintaining high levels of customer satisfaction.	**CWT and LRT:** Measure how fast the DoD supply chain responds to its customers at both the retail and wholesale levels and focuses management attention on timely customer support. **POF:** Measures how well wholesale suppliers respond to their customers and focuses management attention on timeliness and quality. **Fill rate:** Measures customer satisfaction for wholesale inventories and serves as a gauge for efforts to improve inventory productivity. **Tiered inventory turn:** Provides a sizing of inventory relative to customer demand and serves as a measure of success in reducing inventory levels. **Excess on-hand inventory and due-in potential future excess:** Measures potential excesses in on-hand and on-order inventories. **Denial rates:** An indicator of the effectiveness of distribution depots in supporting customer satisfaction with inventory they store.
Sustaining readiness	Work to ensure the DoD supply chain continuously supports the needs of operating forces.	**NMC rates:** An indicator of how well the DoD supply chain is accomplishing its primary mission of supporting the operating forces. **NMC backorders:** Measures the responsiveness of the DoD supply chain in satisfying shortfalls in materiel needed to sustain operations.
Controlling costs	Work to reduce materiel, operating, and management costs, while not adversely affecting performance.	**Value of inventory:** Measures the DoD investment in inventory. **Log cost baseline:** An indicator of how much the warfighter is paying for the three primary functions of logistics—maintenance, supply, and transportation. **Supply management costs:** A measure of how much it costs the Department to manage its inventory.

Appendix B. Enterprise Metrics Data Submission Requirements

Metric	Data Source	Frequency	Content
Customer wait time (O level)	Military services (aggregate monthly times computed by OSD)	• Monthly • Quarterly	• Individual records for each order placed by field-level weapon system maintainers • For services with annual performance goals, year-to-date performance against their goal
Demand forecast accuracy and bias	Military services and DLA	Semi-annually	• The accuracy and bias of annual demand forecasts, including the numerator and denominator for the accuracy and bias calculations • The accuracy distribution of items and dollar demand with a segmentation that allow for DoD roll-up
Denial rates	DLA	Quarterly	• Denial rates by issuing service and DLA
Excess on-hand	Military services and DLA	Semi-annually	• Dollar value of PRS • Percentage of total value of inventory that is excess
Inventory segmentation of no demand items	Military services and DLA	Semi-annually	• Dollar value of inventory segments (AAO, ERS, CRS, and PRS) for items that have 5-9 years of no demand, and 10+ years of no demand
Log cost baseline	DoD budget	Annually	• Financial exhibits for O&M costs and data on manpower costs
Logistics response time	LMARS (aggregate monthly times computed by OSD)	Monthly	• Individual records for each requisition placed on wholesale sources of supply
NMC rates	Military services	Quarterly	• For aggregate weapon system groups and key weapon systems in the Quarterly Readiness Report to Congress, mission capable rates. Besides NMCM and NMCS rates, submissions should include applicable FMC, PMC, and MC rates. For Navy ships, equivalent rates are percentage of time with C3 and C4 CASREPs
NMCS backorders	Military services and DLA (DoD	Monthly	• On-hand backorders for requisitions that are coded to reflect a NMCS or ship CASREP condition divided

Metric	Data Source	Frequency	Content
	totals computed by OSD)		between those backorders that are 0 to 30 days old and those greater than 30 days old
Procurement lead time variances	Military services and DLA (DoD totals computed by OSD)	Semi-annually	• The number of items awarded contracts in a quarter and the difference between the actual ALT and the ALT in the file at the time the procurement request was generated • The distribution of items based on ALT differences in 30-day intervals, from −300 days to 300+ days • The number of items whose procurements were delivered in a quarter and the difference the actual PLT and the PLT in the file at the time the procurement was awarded • The distribution of items based on PLT differences in 30-day intervals, from −300 days to 300+ days
Procurement lead times	Military services and DLA (DoD totals computed by OSD)	Semi-annually	• For items awarded contracts in a quarter, the average ALT • For items whose procurements were delivered in a quarter, the average PLT
Supply management costs	Military services and DLA	Annually	• The actual materiel obligations and supply management and support costs for a year in the form of a financial Fund 1 exhibit
Supply management cost changes	Military services and DLA	Annually	• The actual materiel obligations and supply management and support costs for a year in the form of a financial Fund 1 exhibit
TDD compliance	USTRANSCOM	Monthly	• The percentage of global, CONUS, and COCOM shipments that meet TDD standards • The number of global, CONUS, and COCOM shipments
Due-in long supply	Military services and DLA	Semi-annually	• Dollar value of total on-order stocks that are on contract • Dollar value of on-contract stocks that are above the AAO • Dollar value of on-contract stocks that are potential retention (i.e., ERS and CRS) • Dollar value of on-contract stocks that are potential reutilization (i.e., PRS) • Percentage of total on-order stocks that are above the AAO • Percentage of total on-order stocks that stratify to retention

Metric	Data Source	Frequency	Content
Unserviceable DLR over-aged due-ins	Military services	Quarterly	• The number and dollar value of unserviceable DLR over-aged due-ins at the end of a quarter, broken out by CONUS and OCONUS origins
Unserviceable DLR return time	Military services	Quarterly	• The median return time and number and dollar value of unserviceable DLR returns in a quarter, broken out by CONUS and OCONUS origins
Value of secondary item inventory	Military services and DLA (DoD totals computed by OSD)	Semi-annually	• The dollar values of inventory segments reported for the SSIR and modified to exclude fuels and SSIR in-transit stocks and revalue anticipated condemnations and PRS to full value
Wholesale perfect order fulfillment	LMARS (percentages for on-time, correct quantity, sufficient quality, and proper documentation computed by OSD)	Monthly	• Individual records for each requisition placed on wholesale sources of supply with their MRA coding indicating a discrepancy or no discrepancy
Wholesale supply availability	Military services and DLA (availability percentages computed by OSD)	Monthly	• The number of demands placed on a military service or DLA • The number of demands placed on a military service or DLA that were backordered • The number of on-hand backorders at the end of the month • The number of on-hand backorders at the end of the month that are 180 days or older

Appendix C. Logistics Tools

Tool	Data Source	Data Period	Description
Customer Wait Time	Military Service CWT data file submissions	Monthly, April 2004 to present	• Used to conduct over time analysis of CWT averages, percentiles, and requisition counts. • Tool includes a variety of dimensions and filters, including customer area, item type, fill type, commodity group, source of supply, source of fill, supply chain, urgency, and demand chain.
Logistics Response Time	LMARS SDDB	Monthly, January 2004 to present	• Used to conduct analysis over time of LRT averages, percentiles, and requisition counts. • Enables drill down to response times by pipeline segments. • Tool includes a variety of dimensions and filters, including class of supply, commodity group, customer area, customer headquarters, fill type, priority, discrepancy code, source of supply, supply chain, and transportation mode.
Logistics Reassignment	Federal Logistics Information System	Monthly, February 2015 to present	• Logistics Reassignment refers to the transfer of materiel management responsibilities from one materiel manager to another for the purposes of elimination of multi management of items. • This tool includes data on the number of items by Item Management Code (IMC) that are transferred from being Service managed to being DLA managed. • Data is summarized by total, total less design unstable items, and design unstable items.
Supply System Inventory Report (SSIR)	Military Service SSIR submissions	Annually, 1999 to present	• Provides summary statistics on the status of DoD supply system inventories. • The report summarizes, by dollar value, inventories by DoD Component, retention categories, funding source, and national inventory control points. • Users may compare information by Component, by wholesale versus retail, and consumable versus reparable.

Tool	Data Source	Data Period	Description
Inventory Stratification	Military Service Inventory Stratification submission	Bi-Annually, March 2012 to present Annually, September 2002 to present	• Shows the application of assets against requirements by either dollar value or quantity. • Tool includes a variety of dimensions and filters, including inventory segment, item type, source of supply, and supply chain.
DoD Logistics Snapshot	Various DoD and DLA reports and data sets	Annually, FY16 close	• Summary quad chart that captures a variety of DoD summary logistics data: annual budget, operational resources, assets, and logistics operating locations. • Users may click on the summary data to see details and sources of the data.

Appendix D. Enterprise Metrics Data Quality Validations

Quality checks for assessing whether the Material Distribution Improvement enterprise metrics meet data quality standards are included in the table below. Finished Product Logistics Cost (FPLC) data quality validation checks are to be determined.

Metric	Data	Quality Check Definition and Standard
Customer wait time (O level)	Military services (aggregate monthly times computed by OSD) monthly processing	Relevance • Is time lag of data submission ≤ 20 days? • Is metric accessible in a web-based portal? • Is the validity rate of Customer Area ≥ 95%? • Is the validity rate of Source of Supply ≥ 95%? • Is the validity rate of Supply Chain ≥ 95%? • Is the validity rate of CONUS/OCONUS ≥ 95%? • Is the validity rate of Urgency of Need ≥ 95%? • Is this month's Customer Wait Time 99th percentile within ± 20% of the last 13 months' range? Accuracy • Is the accuracy rate for the Customer Wait Time calculation ≥ 95%? • Is the completeness rate for Order Number ≥ 95%? • Is the completeness rate for Customer Wait Time ≥ 95%? • Is the completeness rate for Order Closing Date ≥ 95%? • Is the completeness rate for CONUS/OCONUS ≥ 95%? • Is the completeness rate for Urgency of Need ≥ 95%? • Is the completeness rate for Source of Fill ≥ 95%? • Is the completeness rate for NSN/NIIN ≥ 95%? • Is the completeness rate for Order Initiation Date ≥ 95%? • Is the completeness rate for Customer Area ≥ 95%? • Is the completeness rate for Source of Supply ≥ 95%? • Is the completeness rate for Supply Chain ≥ 95%? • Is the completeness rate for Platform ≥ 95%? Comparability • Is the rate of unique records = 100%? • Is the collection method documented in a metric guide and followed? • Is metadata available in a web-based portal? • Are quality control activities documented in a metric guide and followed? Interpretability • Is interpretation information documented in a metric guide and followed?
TDD compliance	USTRANSCOM monthly processing	Relevance • Is the metric reported within 1 month of closed records?

Metric	Data	Quality Check Definition and Standard
		• Is metric accessible in a web-based portal? • Is the validity rate of Priority ≥ 97% for the full data population? • Validity: Is the validity rate of Class of Supply ≥ 97% for the full data population? • Is the validity rate of Method ≥ 97% for the full data population? • Is the validity rate of ICP ≥ 97% for the full data population? • Is the validity rate of Depot ≥ 97% for the full data population? • Is the validity rate of CCP ≥ 97% for the full data population? • Is the validity rate of POE ≥ 97% for the full data population? • Is the validity rate of POD ≥ 97% for the full data population? • Is the validity rate of Customer ≥ 97% for the full data population? • What percent of the data subset categories (Measured Population, Extraneous Data, Indeterminate Population, Requires Stakeholder Engagement) has its current month percentage of the total population within ± 1 standard deviation of the 13-month average? Accuracy • Is the accuracy rate for sequence of segments based on mode ≥ 95% for the Measured Population? • Is the completeness rate of required data elements (Priority, Class of Supply, Method, ICP, Depot, CCP, POE, POD and Customer) ≥ 95% for the Measured Population? Comparability • Are parent data sets assessed for duplicates? • Is the collection method documented in a metric guide and followed? • Is metadata available in a web-based portal? • Are quality control activities documented in a metric guide and followed? Interpretability • Is interpretation information documented in a metric guide and followed?
Wholesale perfect order fulfillment minus time	LMARS (correct quantity, sufficient quality, and proper documentation computed by OSD) monthly processing	Relevance • What are the percent of late recorded records? • Is metric accessible in a web-based portal? • Is the validity rate of MRA Discrepancy Code ≥ 97%? Comparability • Is the rate of unique records = 100%? • Is the collection method documented in a metric guide and followed? • Is metadata available in a web-based portal? • Are quality control activities documented in a metric guide and followed? Interpretability

Metric	Data	Quality Check Definition and Standard
		• Is interpretation information documented in a metric guide and followed?

Appendix E. Abbreviations

AAO	approved acquisition objective
ALT	administrative lead time
USD(A&S)	Under Secretary of Defense for Acquisition and Sustainment
AWC	awaiting carcass
C3/C4 CASREPs	C3 and C4 casualty reports
CIMIP	Comprehensive Inventory Management Improvement Plan
COCOM	combatant command
CONUS	continental United States
CRS	contingency retention stock
CWT	customer wait time
CWT_{OM}	customer wait time for organizational maintenance
DAAS	Defense automatic addressing
DILS	due-in long supply system
DLA	Defense Logistics Agency
DLM	Defense Logistics Manual
DLR	depot-level reparable
DoD	Department of Defense
DoDI	DoD instruction
DVD	direct vendor delivery
EMQ	economic movement quantity
ERL	economic retention limit
ERS	economic retention stock
ESB	economic SKU build
FMC	fully mission capable
FY	fiscal year
ICE	Inventory Control Effectiveness
ICP	inventory control point
IPG	issue priority group
ISV	in-storage visibility
LMARS	logistics metrics analysis reporting system
LOT	life-of-type
LRT	logistics response time
MAC	moving average cost
MC	mission capable
MILSTRAP	Military Standard Transaction Reporting and Accountability Procedures
MLDT	mean logistics delay time
MRA	materiel receipt acknowledgement

NMC	not mission capable
NMCM	not mission capable maintenance (NMC-Maintenance)
NMCS	not mission capable supply (NMC-Supply)
NSN	national stock number
OCONUS	outside the contiguous United States
ODASD(Logistics)	Office of the Deputy Assistant Secretary of Defense for Logistics
O&M	operations and maintenance
OSD	Office of the Secretary of Defense
PLT	production lead time
PMC	partially mission capable
POF	perfect order fulfillment
PRS	potential reutilization stock
RIC	routing identifier code
RID	routing identifier
SKU	stock keeping unit
SSIR	Supply System Inventory Report
TDD	time definite delivery
USTRANSCOM	U.S. Transportation Command
WCF	working capital fund

Appendix F. Definitions

administrative lead time	**The time interval between initiation of a purchase request and the date a contract is signed.**
anticipated condemnations	Unserviceable assets that are not expected to be recovered during the repair process. Does not include items currently in supply condition H (condemned).
approved acquisition objective	The quantity of an item authorized for peacetime and wartime requirements to equip and sustain U.S. and allied forces according to current DoD policies and plans. That quantity must be sufficient to support other U.S. government agencies, as applicable.
contingency retention	Quantity of on-hand inventory authorized above the AAO and economic retention for which there is no predictable demand or peacetime requirement but use in specific contingencies justifies retention.
Cost Effectiveness	The price paid for the supply chain resources required to deliver a specific performance outcome. Cost effectiveness is key to right-sizing the DoD inventory investment and controlling supply chain costs. This attribute is an implied constraint on supply chain operations; cost metrics evaluate the DoD investment in the supply chain and assess financial effects on supply chain customers.
customer cost change	Quantifies the changes in overhead and materiel acquisition costs from one year to the next year.
customer wait time	A measurement of the total elapsed time in days between the issuance of a customer order and satisfaction of that order. The following definitions apply to specific customer wait time metrics:
	CWT for organizational maintenance: A measurement of the total elapsed time between submission of a customer order from organizational maintenance and receipt of that order by organizational maintenance.
	CWT for performance budget reporting: The same as customer wait time for organizational maintenance except a military service may elect to limit measurements to orders for items in their budget and management authority.
	CWT for depot maintenance: A measurement of the total elapsed time between submission of a customer order from depot maintenance and receipt of that order by depot maintenance.
demand	An indication of a requirement, a requisition or similar request for an item of supply or an individual item. Demands are categorized as either recurring or non-recurring.
demand forecast error and bias	The difference between actual demand and forecasted demand, stated in a manner that quantifies any bias towards over- or under-forecasting.
depot mapping	Charting customers with their associated materiel demands to primary storage locations for requirement fulfilment

due-in long supply	The dollar value of that portion of secondary item on-contract procurements that stratifies above the AAO.
due-in potential future excess	The dollar value of that portion of secondary item on contract that stratifies as PRS
economic retention	Stock above the approved acquisition objective that is more economical to retain than to dispose of and then potentially repurchase. The economic retention limit is the maximum quantity of on-hand materiel that may be retained in stock, as the applicable retention rules determine.
enterprise level metric	A metric that measures performance across major supply chain functional areas (such as inventory management, distribution management, acquisition management, and maintenance management) and can be used to describe the overall effectiveness of the supply chain.
excess on-hand	The dollar value of secondary item inventory that is categorized as PRS at the end of the measured period, and the percentage of the total inventory dollars that potential reutilization stock constitutes.
functional level metric	A metric that measures performance within a major supply chain functional area.
inventory segmentation of no demand items	Inventory dollars for items with 5 or more years of no demand further segmented in approved acquisition objective (AAO), economic retention stock (ERS), contingency retention stock (CRS), potential reutilization stock (PRS), and anticipated condemnations.
log cost baseline	The costs that DoD customers pay for logistics. It is the total of operations and maintenance costs and military and civilian personnel costs for the logistics activities that are primarily under the purview of the Assistant Secretary of Defense for Logistics and Materiel Readiness—supply, maintenance, and transportation.
logistics response time	A measurement of the total elapsed time (in days) from customer requisition to receipt of materiel ordered from a DoD organic or commercial source of supply. The measurement of logistics response time is from the date in the requisition that a retail supply activity places on a DoD or designated commercial source of supply until the date the requisitioned materiel is received and posted in the requisitioner's materiel management system.
materiel denial rate	The percentage of line items directed for shipment that distribution depots reported as a failure to ship all or part of the quantity originally directed for shipment.
materiel readiness	The ability of the supply chain to support weapon systems when 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 DoD supply chain.
not mission capable rates	The percentage of time a system or equipment is not capable of performing any of its assigned missions because of maintenance

	requirements (not mission capable due to maintenance, NMCM) or a supply shortage (not mission capable due to supply, or NMCS). Mission capable, or MC, indicates a system or equipment is able to perform one of its assigned missions, while full-mission capable, or FMC, indicates a system or equipment is able to perform all of its assigned missions. The difference between full-mission capable and mission capable is partially mission capable, or PMC. Although naval aircraft readiness is evaluated in terms of not mission capable rates, the readiness of Navy ships, submarines, and shipboard systems is evaluated in terms of casualty reports, or CASREPs. Specifically, C3 and C4 CASREPs indicate an NMC condition for Navy ships, submarines and shipboard systems.
not mission capable due to supply backorders	The number of wholesale backorders that are associated with a NMCS condition, grouped for recognition of backorders less than 30 days old and those older than 30 days.
order response time	The percentage of all organizational maintenance orders (i.e., open and completed orders) falling within pre-designated wait time buckets.
perfect order fulfillment	See wholesale perfect order fulfillment.
planning and precision	The ability of the supply chain to accurately anticipate customer requirements and plan, coordinate, and execute accordingly. Planning and precision metrics are key to DoD supply chain management. Their effectiveness affects all the other attributes.
potential reutilization	Stock above the approved acquisition objective and retention stocks identified for potential reuse.
procurement lead time	The sum of the administrative lead time (ALT) and production lead time (PLT). Procurement lead time is the time required for acquisition of secondary items.
procurement lead time variance	The variance or difference between actual lead times and lead times used to build requirements, where the lead times are administrative and production lead time.
production lead time	The interval between letting of a contract or placing an order and receiving the purchased materiel into the supply system.
reliability	The dependability and consistency of the supply chain providers to deliver required materiel support at a time and place specified by the customer. Reliability is key to DoD customer confidence in the DoD supply chain. This attribute focuses on how well the supply chain processes are being executed.
repair cycle time	The repair cycle time metric quantifies the average time to repair materiel from maintainers relative to the planned time to receive materiel. RCT is calculated as the variance or difference between actual repair cycle time and the repair cycle time used in planning.

requirement	This quantity includes the military department– and DLA-forecasted demands for a national stock number (NSN) plus the NSN's pipelines (to support normal supply operations) and levels (to support minor interruptions in the normal supply operations).
responsiveness	The ability of the DoD 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 DoD supply chain fulfills warfighter needs. This attribute is most representative of the customer's perspective of the DoD supply chain.
stock positioning	Decisions on the placement of materiel for storage within the DoD distribution system. Stock positioning decisions are integrated with inventory planning to minimize the total cost to meet customer requirements.
supply management costs	The management costs incurred by working capital funded supply activities. Supply management costs include materiel obligations costs.
time definite delivery	The concept that, within a specified degree of probability, the logistics system can deliver required materiel to the customer within a given period.
time definite delivery compliance	The percentage of time the logistics system can deliver required materiel to the customer within a given period. As a metric, it measures the count and percentage of shipments that meet the time definite delivery standards for a given combatant command and transportation mode. For this metric, backorder time is excluded to focus on transportation and distribution segments
time definite delivery standard	The time to order and receive required materiel from the wholesale echelon of supply. Assignment of a standard is based on the customer's location and the priority the customer places on the order.
tiered inventory turns	The number of times that inventory cycles or turns over in a year. A tiered approach looks at specific layers of inventory and their turn cycles.
unserviceable DLR return time	Unserviceable depot-level reparable return (DLR) time is the sum of base-processing time and in-transit time for an unserviceable return. It begins when an organizational- or intermediate-level maintenance activity turns into supply an unserviceable DLR that it cannot repair; it ends when the receipt of the unserviceable asset by a distribution depot or maintenance contractor is recorded by the materiel manager.
value of secondary item inventory	The dollar value of DoD secondary item inventory by inventory segment.
wholesale perfect order fulfillment	The percentage of demands placed on the wholesale echelon of supply that are delivered (1) on time with the (2) correct item and quantity, in the (3) right condition, and (4) proper documentation. A perfect order has no discrepancies or failures in all four conditions of

	a perfect order. A failure of any one condition is a total failure for that order.
wholesale supply availability	The percentage of demands placed on the wholesale echelon of supply that are not backordered, excluding future material obligations. Supply availability is synonymous with supply materiel availability and material availability.

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA