



DEFENSE LOGISTICS AGENCY
HEADQUARTERS
8725 JOHN J. KINGMAN ROAD, SUITE 2533
FORT BELVOIR, VIRGINIA 22060-6221

IN REPLY
REFER TO

J-6

JUN 11 2001

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE (COMMAND,
CONTROL, COMMUNICATIONS AND INTELLIGENCE)

THROUGH: ACTING DEPUTY UNDER SECRETARY OF DEFENSE (LOGISTICS AND
MATERIEL READINESS)

SUBJECT: Joint Total Asset Visibility (JTAV) Acquisition Program Baseline (APB) and
Economic Analysis (EA) Submission

The JTAV APB and EA submitted by the JTAV Program Manager are provided as special interest major Information Technology Initiative documents. The APB and EA meet the requirements of DoD 5000.2-R and were staffed through the Program Executive Officer. All of the comments were addressed satisfactorily.

A handwritten signature in black ink that reads "Henry T. Glisson".

HENRY T. GLISSON
Lieutenant General, USA
Director

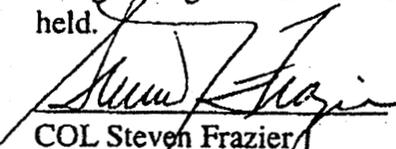
Attachments

1. JTAV APB
2. JTAV EA

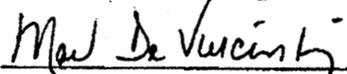
Joint Total Asset Visibility (JTAV) Program Acquisition Program Baseline Agreement

With the objective of enhancing the JTAV Program stability and acquisition discipline, we, the undersigned, approve this baseline document. Our intent is that this rapid prototype program now be managed within the programmatic, schedule, and financial constraints identified. We agree to support the required funding in the Planning, Programming, and Budgeting System (PPBS).

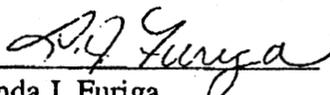
This baseline document is a summary and does not provide detailed program requirements or content. It does, however, contain key performance, schedule, and cost parameters that are the basis for satisfying an identified mission need. As long as the program is being managed within the framework established by this baseline, in-phase reviews will not be held.


COL Steven Frazier
Director, JTAV Program

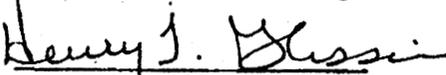
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Mae E. De Vincentis
Program Executive Officer (J-62, Defense Logistics Agency)

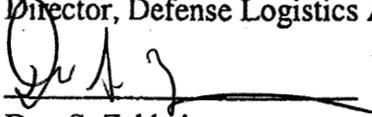
DATE 5-31-01


Linda J. Furiga
Comptroller, Defense Logistics Agency (Executive Agent)

DATE FEB 26 2001


Henry T. Glisson
Lieutenant General, USA
Director, Defense Logistics Agency (Executive Agent)

DATE 6/11/01


Dov S. Zakheim
Under Secretary of Defense (Comptroller)

DATE JUL 26 2001

Linton Wells II
Acting Milestone Decision Authority,
Assistant Secretary of Defense (Command, Control, Communications
& Intelligence)

DATE _____

Joint Total Asset Visibility (JTAV) Program
Acquisition Program Baseline Agreement

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Linda J. Furiga
Comptroller, Defense Logistics Agency (Executive Agent)

DATE _____

Henry T. Glisson
Lieutenant General, USA
Director, Defense Logistics Agency (Executive Agent)

DATE _____

William J. Lynn III
Under Secretary of Defense (Comptroller and Chief Financial Officer)

DATE _____

Arthur L Money
Milestone Decision Authority,
Assistant Secretary of Defense (Command, Control, Communications
& Intelligence)

DATE _____

JOINT TOTAL ASSET VISIBILITY

Acquisition Program Baseline

REFERENCE: JTAV Operational Requirements Document (ORD) (8 Dec 00)

OBJECTIVES: This is an initial APB that establishes the key cost, schedule, and performance requirements, and evaluation criteria, that form the basis for satisfying the mission requirements for Joint Total Asset Visibility in compliance with applicable laws, policies, and procedures.

BACKGROUND: The goal of JTAV is to provide users with visibility across all Services and DLA of assets in storage, in process, or in transit. The JTAV Program began in late 1994 as an ad-hoc Joint Task Force. In 1995, the US Army was given executive agency to further develop the capability, and the Army established the JTAV Office to meet this requirement. In 1996 a JTAV rapid prototype capability was fielded to the US European Command (EUCOM) in support of operations in Bosnia-Herzegovina. This prototype successfully retrieved queried data from disparate source data systems.

Initially, the program charter and funding were scheduled to end at the end of FY 2000. Development continued on the capability and, between 1997 and 1999, it was fielded to the regional combatant unified commands. Support for the capability has grown over the years as JTAV has proven its value in recent operations and with its ability to provide added functionality to meet customer requirements. The capability is the first logistics capability to make the Integrated Priority List (IPL) of every combatant command. JTAV is also being looked at as a data source for other Joint global information systems. Therefore, it is imperative that sustainment of the capability extend into perpetuity.

From an acquisition program standpoint, the JTAV capability has operated in gray areas. In January 1996, the program was designated an Acquisition Category (ACAT) 1AM program. A year later, in Jan 1997, the Deputy Assistant Secretary of Defense (C3I Acquisition) changed the status of the JTAV Program from ACAT 1AM to a Special Interest Major Information Technology Initiative. This action relieved the JTAV Office of some of the acquisition program reporting requirements, but also established a program that did not have clearly designated traditional milestones or approval authorities. In June 1998, Executive Agency was transferred to DLA. Shortly afterward, a DoD Inspector General Audit of JTAV was begun to review the JTAV program. The results of these actions have brought into question the proper categorization of JTAV and have pointed out that several key acquisition documents required under a formal acquisition program were never prepared. Among them was an APB. This APB, therefore, has been developed along with other measures to review, validate, and restore the acquisition oversight of the JTAV Program.

The sections outlined below capture the cost, performance, and schedule parameters of the JTAV capability as they exist today, not when the program was first started. Cost data include total costs spent to date. Milestones were subjectively selected based on major events in the program history. They are not supported by traditional Milestone Decision Authority (MDA) reviews or documentation. Performance measures are required to reflect the Key Performance Parameters

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(KPP) found in an Operational Requirements Document (ORD) approved by the Joint Staff. The JTAV ORD has been validated through the Joint Requirements Oversight Council (JROC) process and approved by DLA. The signatories to this document understand the developmental peculiarities associated with the JTAV Program and its acquisition process and agree to work in cooperation to develop and sustain the JTAV operational capability while ensuring the program's compliance with regulatory requirements.

JOINT TOTAL ASSET VISIBILITY

Acquisition Program Baseline

SECTION A: PERFORMANCE

The following reflects the Key Performance Parameters (KPP) of the JTAV system as defined in the JTAV ORD dated 8 Dec 00.

(1) **KPP Interoperability Requirement**: Interoperability is a mandatory KPP of all Joint systems. The JTAV interoperability KPP is derived from the top level Information Exchange Requirements (IER) matrix at table B of the JTAV ORD that identifies the standards specified in the threshold and objective values. IERs for each source data system are identified in Table C of the JTAV ORD. Appendix E of the JTAV ORD contains an operational view (OV) and a system view (SV) for each of these systems. JTAV, as a member of the Global Combat Support System (GCSS) Family of Systems (FoS), provides the asset visibility function. JTAV adopted GCSS data/information minimum standards of information accuracy, currency, completeness, relevance, timeliness and format consistent with both threshold and objective states.

(a) Threshold: JTAV will accept or exchange common data elements with 100% of source data systems that are identified as critical in the top level IER matrix at Table B.

(b) Objective: JTAV will accept or exchange common data elements with 100% of all source data systems that are identified in the top level IER matrix at Table B.

(2) **KPP Compliance Requirement**: The JTAV IER matrix conforms to all current DoD regulations and policies. Each page contains a synopsis of applicable Universal Joint Task List (UJTL) items, system description and a determination of data source systems requirements to be included in JTAV as a threshold and/or an Open System Environment (OSE). An OSE is a critical system, which adds value to the asset picture, but is less vital to an Initial Operating Capability (IOC). These systems add refined data or bring small pockets of assets not found in national level Service data repositories. The system shall be compliant with the DISA DII COE, JTA and the GCSS program compliance requirements. DISA certified JTAV DII COE at Level 4 within a Windows NT environment using Power Builder applications software. Level 6 DII COE compliant developed software has been submitted to DISA (DMC Slidell, LA) for certification in a UNIX environment including web-based application software.

(a) Threshold: Certified DII COE at Level 6.

(b) Objective: Certified DII COE at Level 8.

(3) **KPP Security Requirement**: JTAV shall use defense-in-depth techniques to achieve Multi-Level Security (MLS) as specified in the JTAV ORD. JTAV will obtain Certification and Accreditation utilizing the Defense IT Security Certification and Accreditation Process (DITSCAP). All Secret and Below Interoperability (SABI) requirements will be met to allow for JTAV to communicate Sensitive but Unclassified (SBU) data to classified systems. The JTAV system will utilize Defense-in-depth strategies, which provide hardening against cyber attacks,

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by utilizing firewalls, guards, virus scanners, intrusion detection technology. Access control measures include strong identification and authentication, securable operating systems and network monitoring systems. Public Key Infrastructure (PKI) Certificates will be exchanged between JTAV Servers, and data is transmitted utilizing Secure Socket Layer (SSL). All personnel accessing JTAV will undergo background security checks to ensure proper clearance to JTAV data and complete User IA Training and Certification. JTAV will notify all system Administrators by identifying vulnerabilities through the IA Vulnerability Alert (IAVA) process and various Computer Emergency Response Team (CERT) advisories. JTAV will implement PKI Certificates for all JTAV users when available. JTAV will conduct penetration-testing activities and continue to mitigate vulnerabilities.

(a) Threshold: Each JTAV server suite will go through the certification and accreditation process using the DITSCAP and SABI requirements.

(b) Objective: Same as threshold.

JOINT TOTAL ASSET VISIBILITY
Acquisition Program Baseline

SECTION B: SCHEDULE

The following reflects the major milestones in the development of the JTAV capability. Dates are captured from the JTAV Quarterly MAIS Report, prepared and submitted under the requirements of DoD Reg 5000.2-R.

	Development Baseline <u>Objective/Threshold</u>
(U) Milestone 0	Jun 95 ¹
(U) Milestone I	Feb 96 ²
(U) Milestone II	Jun 98 ³
(U) Milestone III	Oct 00 ⁴
(U) IOC	Feb 96 ⁵

Footnotes:

(U) As a rapid prototype development, JTAV is categorized as a Special Interest Major Information System. It has not had traditional milestones or an assigned MDA. These milestones are arbitrarily based on major events in the JTAV evolutionary development.

¹ Milestone 0 is based on the date the JTAV Office was established.

² Milestone I is based on the date initial JTAV capability was deployed to EUCCOM.

³ Milestone II is based on the completion of fielding to the other CINCs and the transfer of Executive Agency to DLA.

⁴ Milestone III is based on the completion of the development effort and the transition to a sustainment phase beginning in FY 01-05.

⁵ IOC is based on the date of fielding of the first version of JTAV-IT to EUCCOM in 1996 and reflects IOC listed in the 8 Dec00 ORD..

JOINT TOTAL ASSET VISIBILITY

Acquisition Program Baseline

SECTION C: COST

Cost data is based on JTAV costs incurred to date, and planned through FY05. Initial funding for JTAV was provided on an incremental basis. In 1996, the JTAV program was POMd for and funded through FY 00. The base year in which JTAV received POM funding was FY 97. Costs in this baseline include baseline costs from FY 97 plus the incremental funding provided in FY 94 through FY 96, which was an additional \$24 million. In 2000, additional funds were POMd to sustain the capability from FY01-FY05. These are included in the program totals.

Life-Cycle Cost.

Approved: \$138.6M in FY 2000 constant dollars
\$127.4M in then-year dollars (FY96)

Current Est: \$138.6M in FY 2000 constant dollars
\$127.4M in then-year dollars (FY96)

Program Cost (through 30 Dec 00)

Approved: \$103.1M in FY 2000 constant dollars
\$ 92.9M in then-year dollars (FY96)

Current Est: \$103.1M in FY 2000 dollars
\$ 92.9M in then-year dollars (FY96)

Average Per Unit Cost (APUC):

JTAV is a web based information capability. It is not being procured in a defined "quantity". An Economic Analysis is currently being developed by the JTAV Office to determine economic Return on Investment. It is being based on the number of hits and/or users on the system, and an associated cost avoidance for timesavings as well as procurement savings. An initial draft of the EA shows that irregardless of any other downstream savings in offset procurements, transportation costs avoided, or increased readiness; the \$8- 10 million FY 01-05 annual JTAV sustainment costs will be recouped if JTAV can save just 1500 users 15 hours of work per month.

This figure does not include the development costs through FY00, nor does it capture the savings in time and offset procurements achieved thus far by current JTAV users, which would offset the development dollars. However, JTAV currently averages over 2500 active users annually.

JTAV's total program cost will have been recouped if, over the past five years, JTAV has saved each of 1500 users 6 hours of work per week.

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These estimates are not meant to be definitive, but simply to show that the invested program costs can be recovered, at the least, by creating reasonable time savings over current methods for an attainable user population.

Joint Total Asset Visibility (JTAV) Office

Economic Analysis of the Joint Total Asset Visibility (JTAV) Program FY 94 through FY 05

13 March 2001

Prepared by:

JTAV Program Office
6301 Little River Turnpike, Suite 210
Alexandria, VA 22312-5051

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Executive Summary

Period of Analysis

This economic analysis (EA) covers the period from September 1994, when the Defense Total Asset Visibility (DTAV) Task Force convened, through September 30, 2005, when the current approved funding for the Joint Total Asset Visibility (JTAV) program, created as a result of the DTAV Task Force effort, expires.

Objective

This Economic Analysis derived the following two interrelated objectives for evaluating the JTAV program:

1. What is the most cost effective management approach to meet continuing DoD requirements for Total Asset Visibility (TAV) from FY01 through FY05?
2. What are the most beneficial areas for investment to sustain the JTAV capability from FY01-FY05?

Key Assumptions

- ◆ Growth rates for new users will be 10 - 25% annually over the five-year sustainment period.
- ◆ The average user on a CINC staff is a senior enlisted or mid-career officer. For this analysis, personnel costs were used based on an E7 and O4, both with 14 years experience, as well as an average of the two salaries. An additional 25% to 50% factor was added onto these salaries to account for benefits paid by DoD.
- ◆ The JTAV capability is assumed to save users 50% of the time it takes to gather the same information through other methods.
- ◆ The development tasks scheduled for completion with FY00 funds are completed.

Alternatives

The two objectives mentioned above of this analysis are interrelated but separate issues. Therefore, separate but interrelated alternatives (No. 1 and No. 2) were considered. These were considered in a decision tree sequence, with the first two alternatives evaluating objective #1 above. Then, given that a decision is made on question #1, alternatives No. 3 and No. 4 provide an evaluation to meet objective #2. Alternatives No. 1 and No. 2 address the management for sustaining the JTAV capability.

Alternative No. 1 (Status Quo - JTAV Function Continues to be Centrally Managed and Sustained)

The JTAV capability and infrastructure that will have been built when FY00 funding is exhausted will be sustained and maintained through a centralized type of management. The JTAV Program will be led and managed by a central organization.

Alternative No. 2: (Decentralize JTAV Sustainment Support)

With the end of JTAV development, the capability is turned over to the respective regional Commanders-in Chief (CINCs) for management. The JTAV management function will be decentralized and constituencies will individually take on the responsibility for sustaining the JTAV infrastructure and capability within their respective areas of responsibility. The JTAV sustainment responsibility will shift to Components and the user community.

From the above alternatives will come a recommendation on how the JTAV capability should be managed. Objective #2 above evaluated what the sustainment dollars should be spent on. A significant portion of the approved funding would be spent on personnel, technical, and maintenance costs to operate and maintain the JTAV capability, which were considered non-discretionary. A small portion of the funding was approved for tasks identified by the JTAV Office that this report considered “discretionary.” From this review, two alternatives (No. 3 and No. 4) were selected for evaluation.

Alternative No. 3: (Data Access Modernization)

Under this option, investment of discretionary sustainment funds would primarily focus in technology solutions for modernizing data access mechanisms for existing systems accessed by JTAV. This would include using new technologies and methodologies to reconfigure current access mechanisms to reduce data latency. In some cases, access would be rerouted past intermediate systems directly to source systems.

Alternative No. 4: (Maintain JTAV Capability)

Under this alternative, discretionary funds would be used to continue to maintain the JTAV capability in its current configuration and support customers and training. This includes maintaining JTAV functionality with the FY00 JTAV baseline DoD source data, continue training for JTAV users, continue JTAV support to the Combatant CINCs and provide integrated, joint sources data for DoD applications such as, GCSS COP CSE, JLACTION, etc. This alternative does not provide for development of new functionality in the JTAV capability but merely maintains the current capability.

Costs/Benefits

For objective #1, the costs of centralized sustainment under alternative No. 1 were compared to an estimated cost for sustainment under alternative No. 2. Under alternative No.2, costs were double those of centralized sustainment.

Appendix E presents a range of cost savings, based on various assumptions and growth rates. The total **potential** savings, expressed in terms of manpower costs and adjusted for NPV, ranges from \$64.9 to \$177.4 million over the five year sustainment period. This represents a **potential ROI** for the \$43.8 million (\$40.2 million NPV) sustainment budget of **between 1.61 and 4.41**. However, user statistics show that only about 20% of registered account holders use the system regularly. This reduces the real manpower savings by 80%, to between \$13.0 and \$35.5 million, which results in a **real ROI**, if nothing changes, of **only .32 to .88**. This real versus potential ROI for manpower costs was the basis for evaluating alternatives No. 3 and No. 4.

This ROI **does not include** the cost avoidance savings to DoD of having JTAV as a source data system for other systems, programs, and decision support tools that need asset information. Those cost avoidance savings, based on JTAV’s access to over 80% of DoD logistics systems through a single interface, are between \$15 and \$45 million **per program**. With seven programs already identified as wanting to use JTAV, potential cost avoidance savings of \$105 to \$315 million and an **additional ROI of 2.6 to 7.8** are already being realized.

These costs are highly subjective, and manpower savings do not necessarily represent true savings unless force structure or staff sizes are reduced. Therefore, additional analysis was done to compare the benefits of each course of action against program and DoD objectives as shown below.

In addition to costs, alternatives No. 1 and No. 2 were compared against the JTAV program and capability objectives. The benefits were measured against how well the alternatives meet the DoD TAV objectives. The following charts summarize that comparison.

Charter Requirement	Central Office	Decentralized Office
Ensure the required level of TAV capability is provided to the CINCs (Commanders-in-Chief), including subordinate Joint Task Force (JTF) Commanders, the Services, and DoD activities.	Yes, to all CINCs	Yes, to their regional AOR and subordinates
Ensure that JTAV policies, processes, plans, programs, and procedures are fully synchronized, integrated, and institutionalized.	Yes	Possibly, but with more complexity
Facilitate, in conjunction with the other functional communities, the appropriate application of logistics-related C4 systems and related enabling technologies to	Yes	Possibly, but with more complexity

provide JTAV capabilities and process improvements. The goal is to maximize effectiveness and also achieve related cost savings.		
Execute the DTAV Implementation Plan.	Yes	No
Refine and clarify user requirements and the JTAV operating concept.	Yes	Yes, for their own users
Implement JTAV operational and systems architectures.	Yes	Partially, for their AO
Ensure that the planning and execution of JTAV fully supports DoD's Logistics Strategic Plan.	Yes	No
Determine the scope of and requirements for Joint TAV at the wholesale, retail, and tactical levels of logistics.	Yes	Partially, retail and tactical for their AO
Perform the central role as the functional integrator. It will serve as the proponent for JTAV and will lead and manage the Joint TAV effort DoD-Wide.	Yes	No
Identify JTAV priorities and establish development schedules.	Yes	Yes, but for each CINC
Explore and exploit technology to provide a JTAV capability DoD-Wide.	Yes	No, not DOD wide
Coordinate JTAV initiatives and funding requirements.	Yes	Partially, will do so for their JTAV piece

The alternatives were also compared against how well they support the JTAV capability objectives:

JTAV Capability Requirements	Central Office	Decentralized Office
Be fully deployable and capable of supporting the CINCs, and JTF Commanders by being interoperable with the Services and Agencies legacy and future systems.	Yes	Yes, but only for the regional CINC. May not remain interoperable among CINCs
Operate the same in both peace and war.	Yes	Yes
Be simple and easy to use.	Yes	Maybe, depends on what changes the CINCs make
Use existing data elements and databases.	Yes	Yes
Support the wholesale logistics item manager's need for DoD wide visibility of Service and Agency assets.	No (but plans to)	No (CINCs not likely to get into wholesale business voluntarily)
Be compliant with the GCSS CRD, the Defense Information Infrastructure Common Operating Environment (DII COE), and the DoD Joint Technical	Yes	Perhaps. Risk is that CINCs will use different standards

Architecture.		
Be timely and accurate.	Yes	Yes, for their AO
Reduce cost and improve efficiency.	Yes	No
Support garrison, deployed, and non-deploying organizations.	Yes	Yes, for their AO
Place no additional burden on operating forces.	Yes	No. Will probably tax CINC logistics and IT staffs

For alternatives No. 3 and No. 4, a different approach was used, since measuring the benefit value of information used to make better decisions is an elusive metric, for JTAV as well as other DoD information systems programs. For objective #2, this analysis looked at only one, discrete parameter to establish a quantifiable baseline: the expected value of hours saved by JTAV users. A JTAV user may be a supply clerk or a staff officer. This analysis made no attempt to quantify the downstream benefits to DoD of the actions taken as a result of the information obtained, but stresses that they could be significant. These include reduced inventory holding costs, reduced transportation costs, offset procurements, reduced training costs, and lives saved or suffering reduced by faster logistics responsiveness.

To evaluate the technological aspects of alternative No. 3, we relied on an evaluation of the JTAV operational and systems architectures done by the Gartner Group, a leading technology consulting company. They expressed concerns about the maturity and capability of the solutions needed to implement this alternative.

A comparison of alternatives No. 3 (data modernization) and No. 4 (maintain JTAV capability) was done against JTAV capability objectives.

JTAV Capability Requirements	Data Modernization	Maintain JTAV Capability
Be fully deployable and capable of supporting the CINCs, and JTF Commanders by being interoperable with the Services and Agencies legacy and future systems.	Yes, but more complex interfaces	Yes
Operate the same in both peace and war.	Yes	Yes
Be simple and easy to use.	Yes, but more complex to maintain	Yes
Use existing data elements and databases.	No. Databases would require reconfiguration and software modifications	Yes
Support the wholesale logistics item manager's need for DoD wide visibility of Service and Agency assets.	No	No

Be compliant with the GCSS CRD, the Defense Information Infrastructure Common Operating Environment (DII COE), and the DoD Joint Technical Architecture.	Maybe. Mediation products are not tested and may conflict.	Yes
Be timely and accurate.	Yes, data is near real time and same as source.	Maybe. Data latency is still encountered. Data is only as accurate as last provided update.
Reduce cost and improve efficiency.	Yes, will attract more users	Yes, will attract more users
Support garrison, deployed, and non-deploying organizations.	Yes	Yes
Place no additional burden on operating forces.	Yes	Yes

Recommendations

Program Management

This analysis clearly favors Alternative No. 1 and maintaining a centralized management of the JTAV capability. Costs for alternative No. 2 were estimated to be double those for centralized sustainment under alternative No. 1. Centralized management is not only cost efficient, but the qualitative benefits to DoD strongly favor maintaining the gains made by the JTAV Office over the past five years. In addition to CINC user cost savings, JTAV provides cost avoidance to DoD as a source data system by providing access through a single interface to over 80% of DoD’s logistics systems. This benefit saves DoD \$15 to \$45 million per program/system, for every system that uses JTAV as a source data system rather than attempting to access the data again through the data proponents. The most logical and cost effective recommendation is to keep the current JTAV Office “team” in place, subject to sustainment funding limits. However, centralized management under any DoD agency capable of performing the program management and sustainment functions is preferred to decentralized sustainment.

Capability Sustainment

While both alternatives meet DoD requirements, alternative No. 4 is recommended. The limited flexibility of the sustainment budget and the Gartner Group’s recommendations make alternative No. 3 a risky alternative with limited benefits. The potential ROI of between 1.6 and 4.41 and the actual ROI of only .32 to .88 show that JTAV’s value is severely reduced by the low numbers of actual users. With only 20% of JTAV account holders actually using the system, alternative No. 4 recommends methods to maintain support and training for JTAV users, continue to meet the JTAV users needs and maintain access to JTAV FY00 source data providers. In addition to manpower savings, asset visibility through JTAV can provide significant but intangible savings when managers can proactively reduce costs through redistribution, offset procurements, and better inventory management. Also, as previously mentioned, there is a cost avoidance savings of \$15 to \$45 million per program for other DoD programs that use JTAV as a source data system. GCSS COP CSE, JL ACTD, ALP and ICIS currently access integrated, joint logistics data from JTAV. Without JTAV, each of these systems

Unclassified

would need to develop and maintain independently their own data feeds from the 25 different source data systems that JTAV accesses.

Economic Analysis

Joint Total Asset Visibility (JTAV) From FY1994 through FY2005:

Note: DoD Instruction 7041.3, Economic Analysis for Decisionmaking, Nov 95, paragraph E3.2.4, states the “the results of the economic analysis, including all calculations and sources of data, must be documented down to the most basic inputs to provide an auditable and stand-alone document.” In order to provide a complete picture of the JTAV Office and the JTAV capability, this report contains significant amounts of historical data relative to the JTAV program and its performance to date. Readers familiar with the JTAV program and these elements may wish to scan or skip certain sections of this document for brevity.

1.0 Period of Analysis

This economic analysis (EA) covers the period from September 1994, when the Defense Total Asset Visibility (DTAV) Task Force convened, through September 30, 2005, when the current approved funding for the Joint Total Asset Visibility (JTAV) program, created as a result of the DTAV Task Force effort, expires.

This EA establishes the baseline for JTAV at the end of the JTAV development cycle and entering into its sustainment phase from FY01 through FY05. Although JTAV entered into sustainment on 1 Oct 00, FY00 funds have been previously committed to contractual development efforts whose period of performance carries over into FY01. When these funds are consumed by the contractor’s activities, JTAV development will be complete.

1.1 Why An EA Now?

The JTAV program is classified as a “Special Interest Major Information Technology Initiative” acquisition program.¹ This classification established tailored acquisition management controls allowed by regulation, but did not require the JTAV Office to prepare traditional acquisition program documents such as an Economic Analysis (EA), Operational Requirements Document (ORD), or an Acquisition Program Baseline (APB). A Department of Defense (DoD) Inspector General (IG) audit, however, questioned the classification of the JTAV program and its relief from more formalized acquisition management. The DoD IG recommended that JTAV restore acquisition management and prepare the necessary acquisition documents, including an Economic Analysis. Coincidentally, in 1998, Executive Agency was transferred from the US Army to the Defense Logistics Agency (DLA), which wanted more formalized controls over the program as well. To meet the recommendations of the IG, in July 1999 DLA directed the JTAV Office to prepare these documents. In addition, an acquisition Integrated Process Team (IPT) has been formed to restore acquisition discipline to the JTAV project. This IPT has also requested the preparation of this EA. Priority of effort went to developing and staffing an ORD and APB, followed by this EA.

¹ Memorandum, Deputy Under Secretary of Defense (Logistics), 27 Jan 1997, SUBJECT: Joint Total Asset Visibility.

1.2 Why Wasn't an EA Done Before Now?

As part of the traditional DoD acquisition process, Economic Analyses are to be done prior to investing in the program or initiative. Why wasn't one done before five years and \$90 million was invested in the JTAV program? The answer lies in JTAV's development evolution.

In the aftermath of the Gulf War, on April 30, 1992, the Assistant Secretary of Defense (Production and Logistics) approved the Department of Defense Total Asset Visibility Plan to: "improve some long standing deficiencies in how the DoD logistics system collects, reports and acts upon asset information." In September 1994, the Deputy Under Secretary of Defense for Logistics (DUSD(L)) formed a TAV Joint Task Force to develop a clear, comprehensive plan for implementing and integrating a TAV capability throughout DoD. Total Asset Visibility (TAV) is the capability to provide timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, and supplies, including the ability to provide timely and accurate status on requisitions. It also includes the capability to act upon that information to improve the overall performance of the Department of Defense's (DoD's) logistics practices. The task force developed the Defense Total Asset Visibility (DTAV) Implementation Plan, published in 1995. The DUSD(L) established and chartered the Defense Total Asset Visibility (now Joint Total Asset Visibility) Office in June 1995 to implement the DTAV plan as well as develop and field a rapid prototype portion of the TAV requirement aimed at satisfying the needs of geographic Commanders in Chief (CINC) or Joint Task Force (JTF) commanders and their staffs. This prototype is the JTAV capability.

From the beginning, the JTAV Office and JTAV capability have followed an ad-hoc, non-traditional acquisition process. JTAV was initially classified as an Acquisition Category (ACAT) 1AM program, but did not meet the established criteria for such a designation. In order to maintain acquisition control but still allow maximum JTAV development, in Jan 1997, the Assistant Secretary of Defense for Command, Control, Communication, and Information (ASDC3I), changed JTAV's designation to a "Special Interest Major Information Technology Initiative." Although still officially classified as a "Special Interest Major Information Technology Initiative," the DoD IG recommended that the JTAV program prepare this more formal acquisition documentation.

2.0 Objective

The objective of any economic analysis is to "demonstrate a projected return on the investment that is clearly equal to or better than alternative uses of available public resources. Return may include: improved mission performance in accordance with measures developed pursuant to the Government Performance and Results Act; reduced cost; increased quality, speed, or flexibility; and increased customer and employee satisfaction. Return should be adjusted for such risk factors as the project's technical complexity, the agency's management capacity, the likelihood of cost overruns, and the consequences of under- or non-performance."² This Economic Analysis derived the following two interrelated objectives for evaluating the JTAV program:

² Analytical Perspectives, Budget of the United States Government, Fiscal Year 2001, p. 162

1. What is the most cost effective management approach to meet continuing DoD requirements for Total Asset Visibility (TAV) from FY01 through FY05?
2. What are the most beneficial areas for investment to sustain the JTAV capability from FY01-FY05?

To meet these objectives, the following tasks for this EA were identified:

- A. Discuss how the JTAV Office and the JTAV capability meet the DTAV objectives they were assigned.
- B. Discuss the costs and benefits derived from the investment in the JTAV Office and the JTAV capability, and
- C. Review alternatives and make recommendations regarding the continued management of the functions assigned to the JTAV Office and the sustainment of the JTAV capability from FY01 through FY05.

3.0 Assumptions/Background

3.1 Assumptions:

- ◆ Information from the US European Command (EUCOM) showed that in November 1996, they had 105 JTAV account holders.³ By April 2000, that number had grown to over 930, a nearly exponential growth rate of 221% annually. Growth rates for all JTAV sites for the 3-month period from Feb-Apr 2000 showed a quarterly growth rate (defined as new user accounts) of 12.4%, or nearly 50% annually.⁴ Realizing that there is a theoretical maximum saturation point for users, and that JTAV has been fielded for several years, these explosive growth rates are still possible but not realistic. This analysis assumed the new accounts will be issued to give access to the JTAV capability at annual growth rates of 10% to 25%, and modeled this data at 10%, 15% and 25% increments to provide a low, mid, and high range.
- ◆ It is assumed that the average CINC/JTF staff member is either a senior enlisted or mid career officer. For this analysis, we have chosen to model personnel costs based on the annual FY 2000 compensation of both an E-7 and an O-4, both with 14 years experience; and an average of the two salaries. This provides a low, average, and high salary estimate.
- ◆ The GAO reports that total cost of military personnel is greater than the sum of their direct compensation. Direct compensation, including pay, housing allowance, and subsistence, only

³ Information Paper, DALO-JTAV, 7 Nov 1996, Subject: Joint Total Asset Visibility (JTAV) Capability

⁴ JTAV Statistics compiled by Karen Gunderson of CSC, Inc.

accounted for 63% of the total cost. The remaining 37% includes retirement, social security, medical and other benefits paid for by the government.⁵ To model these costs, the military compensation figures of the E7 and O4 mentioned above were increased by factors of 25%, 37%, and 50% to provide a low, average, and high benefits estimate.

- ◆ It is assumed that the CINC/JTF staffs that are potential JTAV users have the following work profile:
 - 8 hours a day
 - Five days week
 - 48 weeks per year for a total of 1920 man-hours per year. (Assumes two weeks vacation and two workweeks of Federal holidays per year).
- ◆ Sustainment funding from FY01 through FY05 will be provided in the amounts approved by DLA: \$10.0, \$9.0, \$9.0, \$8.0, and \$7.8 million respectively from FY01-05.
- ◆ The regional CINCs that host the JTAV capability can obtain funding to support JTAV functions. This analysis does not assume the CINCs will fund JTAV at current levels.
- ◆ The CINCs are assumed to be able to procure the same technical and support services currently provided by the JTAV Office. Some, if not all, of the program support functions currently performed by the JTAV Office would still have to be performed in the sustainment period. These functions include program management, configuration management, data management, testing, security management, systems administration, and training.
- ◆ The nature and scope of the JTAV capability that will have been completed with the expenditure of FY00 funds determines the types of costs that will be incurred in succeeding periods. A major assumption is that the development projects to complete the JTAV capability using FY00 funding will be completed. Specifically, it is assumed that the JTAV Office will complete the following tasks by the end of FY00:
 - Completion of security work: Replacement of non-compliant guards at CINC systems, including acquisition of the necessary approvals and construction of data filters.
 - Database re-design: Critical work to access JTAV data in a “drill-down” manner, building of stored procedures to provide asset visibility information to applications requiring such information, accessing data at its source, technical data modeling, and providing information in relational and object oriented manner to JTAV users.

⁵ GAO Report GAO/NSIAD-96-183, “Defense Budget: Trends in Active Military Personnel Compensation Accounts for 1990-1997,” July 1996, p.2.

- ❑ Provision of JTAV data to applications: Facilitate new contracts with the completion of stored procedures.
- ❑ Objective architecture development: Completion of work on the objective architecture designed to reduce the volume of data passing across communication links in response to queries.
- ❑ Software upgrades: Upgrade of systems software to permit efficient and state of the art operations at the end of FY00.
- ◆ Personnel costs represent only a small, discrete performance measure: the cost of time saved for a user to perform an assigned task. The benefit of this can be either in cost savings from reduced personnel requirements (same bang, less bucks) or increasing the effectiveness of an established number of personnel (more bang, same bucks).
- ◆ As of April 2000, JTAV had just over 3000 registered account holders.⁶ Of these, just under 500 are accounts for the classified servers. It is assumed that if a user has a classified account that they also have an unclassified account. It is also assumed that those dual account users will only use one account at a time. Therefore, to eliminate the bias of applying timesaving to dual account holders, the baseline number of accounts used for growth projections excluded the classified accounts and was rounded to a baseline of 2500 users for FY01.
- ◆ Not all JTAV account holders will use the system in a given period of time. A small sample of data from February through March 2000 shows that about 20% of registered users actually logged in and made queries.⁷ This report assumes the 20% is typical usage.
- ◆ The JTAV capability is assumed to save users 50% of the time it takes to gather the same information through other methods.

3.2 Constraints

In order to meet timeline goals established for this EA, some assumptions and generalizations were necessary and precluded further analysis in some areas that would produce more exact statistics. However, the margin of error for these generalizations was done on the conservative side, not the best case. Furthermore, trends in similar processes such as Activity Based Costing reveal that parameter variations, which are "reasonable estimates," are often diluted in the analytical process to the point of insignificance when compared to highly precise data, indicating that precision is not always necessary.

⁶ JTAV Statistics compiled by Karen Gunderson of CSC, Inc.

⁷ Ibid.

Cost estimates and sustainment tasks were developed by the JTAV Office for funding purposes and were used in this Economic Analysis for consistency. Funding has already been approved for FY01 through FY05 at \$10.0, \$9.0, \$9.0, \$8.0, and \$7.8 million respectively, for a total sustainment budget of \$43.8 million (\$40.2 million net present value). This report relied on cost data, historical data, and sustainment task estimates provided by the JTAV Office.

3.3 Sunk Costs and Realized Benefits: JTAV Background

DOD Instruction 7041.3 para E.3.4.2.1.2 states that sunk costs and realized benefits are not included in the comparison of alternatives. Sunk costs and realized benefits should be discussed in the assumptions for the analysis.

The JTAV Office and the JTAV capability have been funded and operational for the past five years. In JTAV Office funding charts, program funding is shown as starting in 1994 with the initial \$3.4 million used to fund the TAV JTF. Funding was increased over the years to a high of \$21.5 million in FY97. The costs associated with the program from FY 94 to FY 00 have been \$13 million annually, and total program costs through FY00 exceed \$90 million. FY00 funds were committed to development contracts in FY00, even though the period of performance extends into FY01. Therefore, the sunk costs associated with the program are those from FY 94 to FY 00.⁸

This section will discuss the relevant history of the JTAV Office and the JTAV capability, and realized benefits.

3.3.1 Understanding the TAV Requirement

In order to properly evaluate the objectives of the JTAV program, one must consider how the JTAV program objectives support DoD requirements. Therefore it is necessary to provide some explanation of the overall DoD TAV initiative requirements.

Total Asset Visibility (TAV) is defined as the capability to provide timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, and supplies. It also includes the capability to act upon that information to improve overall performance of DoD logistics practices. TAV includes the ability to provide timely and accurate status on requisitions.⁹

The TAV requirement is eloquently summarized in the November 1997 Defense Reform Initiative Report of then Secretary of Defense William Cohen:

“Just-in-time logistics is revolutionizing the private sector and can do the same for DoD. The Department has made a commitment to provide total visibility into its equipment, supplies, and spare parts, all the way from the warehouse in the United States to the foxhole in a distant theater. Utilizing

⁸ Cost data provided by Mr. Doug Buckley, JTAV Office

⁹ Defense Total Asset Visibility Implementation Plan, Nov 1995, p. iii.

modern inventory and transportation-monitoring equipment and techniques, we plan to have in place a system that will track every piece of equipment, every supply shipment, and spare parts requisition on a continuous basis. Electronically linking logistics data from the Services and various DoD components, the system will provide full, remote visibility of supplies in-storage, in process, and in-transit. Forward-deployed logisticians need no longer place duplicate orders for equipment, or stockpile needless supplies fearing a lack of critical supplies at the key moment. The result will be fewer duplicate requisitions, bottlenecks, and unnecessary purchases. Prototyped in Bosnia, this new system of total asset visibility will permit greater efficiency in scheduling transportation, smaller inventories of supplies and spare parts, and greater confidence by warfighters that critical supplies and spare parts will be in-theater on time. In wartime it will also enable the right supplies to get to the right troops more quickly and enable supplies en route to one theater to be redirected to a second theater, if needed. This program has been fielded to EUCOM, CENTCOM and ACOM and is scheduled to become fully operational in 2000.”¹⁰

The Department’s need for TAV, which has long been recognized, is based on two key factors: military readiness and the cost of providing logistics support to operating forces. An asset visibility capability can help to improve readiness by identifying the location of critical resources resulting in the efficient use of resources; can improve a commander’s ability to assess courses of action during planning and monitor execution of operations; and assists in identifying redundant or unnecessary procurement actions and excessive inventories. If a deficiency of asset visibility exists, scarce resources are diverted from other requirements. The reduction of military spending and military force structure over the past several years, combined with increasing numbers of operational missions to support worldwide, requires DoD to devise ways to perform more missions with less resources. DoD has numerous programs underway to increase the ability of individuals within DoD to accomplish their jobs more efficiently and more rapidly, thereby increasing the number of tasks an individual can perform during the workday. In the case of DoD logisticians, JTAV is one capability chartered to enable logisticians to perform their jobs more efficiently and rapidly.

3.3.2 Objectives of the JTAV Office

To meet the DoD TAV requirement, the DTAV (now JTAV) Office was established and chartered to:¹¹

1. Ensure the required level of TAV capability is provided to the CINCs (Commanders-in-Chief), including subordinate Joint Task Force (JTF) Commanders, the Services, and DoD activities.
2. Execute the DTAV Implementation Plan.
3. Perform the central role as the functional integrator. It will serve as the proponent for JTAV and will lead and manage the Joint TAV effort DoD-Wide.

¹⁰ Defense Reform Initiative Report, Nov 1997, p.10-11.

¹¹ JTAV Charter, from the JTAV homepage (<http://www.acq.osd.mil/log/jtav/charter.htm>).

4. Ensure that JTAV policies, processes, plans, programs, and procedures are fully synchronized, integrated, and institutionalized.
5. Ensure that the planning and execution of JTAV fully supports DoD's Logistics Strategic Plan.
6. Determine the scope of and requirements for Joint TAV at the wholesale, retail, and tactical levels of logistics.
7. Facilitate, in conjunction with the other functional communities, the appropriate application of logistics-related C4 systems and related enabling technologies to provide JTAV capabilities and process improvements. The goal is to maximize effectiveness and also achieve related cost savings.
8. Refine and clarify user requirements and the JTAV operating concept.
9. Implement JTAV operational and systems architectures.
10. Coordinate JTAV initiatives and funding requirements.
11. Identify JTAV priorities and establish development schedules.
12. Explore and exploit technology to provide a JTAV capability DoD-Wide.

3.3.3 Objectives of the JTAV Capability

Various DoD instructions and guidance placed management controls on the JTAV Office for development of the JTAV capability. As a result, in addition to the objectives for the JTAV Office, the following additional objectives were laid out for the JTAV capability. It must:¹²

- (a) Be fully deployable and capable of supporting the CINC's and JTF Commanders.
- (b) Be interoperable with legacy and future systems of the Services and Agencies.
- (c) Hardware and applications will operate the same in peace, Military Operations Other than War (MOOTW), and war. Staffing will be ramped up to sustain higher levels of system availability to support expected increased system demand. Bandwidth requirements will increase as well. Restrictions on use, while not anticipated, could be exercised as required. Refer to paragraph 5 below regarding bandwidth issues.
- (d) Be user friendly. Enterprise changes will be implemented as field operators and planners provide feedback and incorporate CINC specific lessons learned.

¹² Operational Requirements Document for the Joint Total Asset Visibility Capability (Draft), 8 Dec 2000, p.21.

- (e) Use existing data elements and databases.
- (f) Support DoD wide joint visibility needs of Service and Agency assets.
- (g) Be compliant with the DII COE, and JTA.
- (h) Supports GCSS CRD requirements.
- (i) Be timely and accurate.
- (j) Reduce cost and improve efficiency.
- (k) Support garrison, deployed, and non-deploying organizations.
- (l) Place no additional burden on operating forces.

3.3.4 The Initial JTAV Mission

The DoD TAV initiative encompasses several key requirements in four areas: requisition tracking, visibility of assets in-storage or in process, visibility of assets in-transit, and logistics management within a theater of operations. Initially, JTAV was designed to support the fourth area: in-theater logistics management. Other programs were developed or planned to accomplish the other three areas. The Logistics Information Processing System (LIPS), developed by the Defense Automatic Addressing System Center (DAASC), provides visibility over the status of requisitions. The various systems of each inventory control point (ICP) will provide visibility of assets that are in-storage or in process, with the latter defined as assets being procured or repaired. The Global Transportation Network (GTN) provides in-transit visibility.¹³ In addition, each service has undertaken an asset visibility initiative to provide better visibility within their respective service.

Thus, while JTAV is a major contributor to the goal of DoD-wide Total Asset Visibility, it is only one of several large programs within DoD supporting asset visibility. In 1998, the General Accounting Office (GAO) found that total funding requirements, while not finalized, for all TAV initiatives in DOD exceeds \$600 million.¹⁴ The JTAV portion of this, including both sunk costs from FY95 to FY00 and projected sustainment costs from FY01-05, is approximately 23% of the total.

3.3.5 JTAV Requirements Growth

In 1995, the same year as the JTAV Office was chartered, DoD abandoned a key portion of the wholesale in-storage and in-process capability. A family of nine standard systems being developed under the Corporate Information Management (CIM) program collectively called the Material

¹³ Defense Total Asset Visibility Implementation Plan, November 1995, p.2-1 to 2-4.

¹⁴ GAO Report T-NSIAD/AIMD-98-122, Defense Management: Challenges Facing DOD in Implementing Defense Reform Initiatives, Mar 98, p. 12.

Management Standard System (MMSS) was supposed to be fielded at 17 inventory control points (ICP) to provide standardized wholesale item management and visibility functions and eliminate hundreds of legacy systems. Started in 1989, this approach was fundamentally changed in 1995 to allow the Defense Logistics Agency (DLA) and the services to choose what applications they wanted and use middleware to access the legacy systems' data. Furthermore, the systems would be fielded at selected ICPs, not all of them. Of the nine systems envisioned, only the Stock Control System was eventually fielded and then only to the Air Force and Marine Corps with limited functional capability. The system was to have been fielded over 8 years, at a total cost of \$5.3 billion. Instead, over \$700 million was wasted on the project.¹⁵

Following the change in MMSS strategy, another GAO report recommended that DoD must provide managers with the tools, critical to managing inventory efficiently, that it had planned to provide through the Defense Base Operating Fund (DBOF) and CIM initiatives. It found that JTAV and ITV strategies will rely on CIM for success and that until CIM migration systems are fully implemented, these dependent strategies may experience considerable difficulty achieving their goals and objectives.¹⁶ The abandonment of the MMSS system increased JTAV requirements significantly. It meant that the JTAV Office would now have to identify and access the systems MMSS was supposed to replace. It also resulted in expanding the requirements for the JTAV capability to take on a wholesale asset visibility role.

Another DoD program, the Joint Ammunition Management Standard System (JAMSS) has experienced significant schedule slippage. Again, DoD turned to the JTAV Office for help with ammunition visibility. Working with the ammunition community, the JTAV Office developed the National Level Ammunition Capability (NLAC), the first joint ammunition asset visibility capability, which became operational in 1998. NLAC is not meant to replace JAMSS, but rather to meet the DoD requirement until JAMSS matures, at which time it will become the first module of JAMSS.

A similar expanded requirement is being developed for the personnel community. Known as Joint Personnel Asset Visibility (JPAV), this prototype capability is the final development effort for JTAV using FY00 funds.

The JTAV program received numerous requests for additional capabilities, many of which it was able to accommodate, as funds permitted, under the flexibility offered by its status as a rapid prototype "special interest" acquisition program. These included support to Kosovo and Bosnia, the Defense Information Systems Agency's (DISA) Common Operating Picture (COP), several decision support tools, and several military exercises.

3.3.6 The JTAV Capability: In-Theater vs. Global JTAV

¹⁵ GAO Report GAO/AIMD-96-109, Defense IRM: Critical Risks Facing New Materiel Management Strategy, Sept 1996.

¹⁶ GAO Report GAO/NSIAD-97-28, Logistics Planning: Opportunities for Enhancing DOD Logistics Strategic Plan, Dec 96.

The JTAV capability began in 1995 to support the asset visibility requirements of logistics elements of CINC and Joint Task Force commanders and staff. There are numerous automated systems in the various services and government agencies that track, manage, order, and account for materiel and personnel assets. There are also initiatives within the services to develop a TAV capability to provide a single integrated picture of service specific logistics data. None of these systems, however, provides an integrated, joint picture of materiel and personnel required by today's joint environment. These systems remain stove-piped either by commodity or service. The JTAV capability was chartered to bring these resources into a joint capability. The initial JTAV capability designed for CINCs and JTF commanders is known as JTAV In Theater (JTAV-IT) and consists of a capability distributed to each regional CINC that provides logistics information tailored to the requirements of that CINC.

Similar to an advanced search engine, JTAV allows commanders and logistics personnel at every level to access logistics data from dozens of Service, Agency, and commercial systems through a single, web-based interface. The JTAV capability enables users to focus on answers and make time sensitive decisions, rather than accessing, probing, amassing, and organizing data from a host of legacy systems applications. JTAV provides a mission critical function to the warfighter and decision-maker. JTAV is designed to be adaptable in a wide variety of operational environments. A user may interface JTAV through any PC with Internet access. That access can be accomplished in a wide variety of communications media on the Unclassified but sensitive Internet Protocol Router Network (NIPRNET). JTAV also provides a duplicate capability on the Secret Internet Protocol Router Network (SIPRNET).

After the abandonment of the MMSS system, the requirements for visibility of wholesale in-process and in-storage assets was picked up, in part, by JTAV, which developed a "Global JTAV" vision. Global JTAV would ensure the required level of JTAV capability is provided to DOD's sustaining base organizations, operational units, defense agencies, and their commercial counterparts. If fully deployed, Global JTAV would track in-storage, in process, and in-transit assets and provide regional consolidation to improve DoD's capabilities. Several Global JTAV redistribution initiatives were tested, including the interservice visibility of consumables, reparable, and maintenance activities.¹⁷ JTAV now was focusing on supporting the asset visibility needs of two very distinct customer populations, both inside and outside a theater. "JTAV customers" or "JTAV users" include supply activities down to the direct supply support activity that interfaces with the consuming customer; transportation operational activities; maintenance support activities at all levels; inventory managers; logistics and personnel planners and staffs at the DoD, Military Service, and Defense Agency Headquarters; Service logistics commands; logistics and personnel staffs of CINCs, JTFs, and their Service components; and the Joint Planning and Execution Community (JPEC) involved with deployment planning, execution, employment, and redeployment. Reduced funding levels through FY00, however, limited JTAV development to the in-theater module, and Global JTAV remains an unfunded future requirement.

3.3.7 Program Milestones

¹⁷ Joint Total Asset Visibility Strategic Plan, January 1999, p.2-3.

The JTAV capability was designed to be a rapid prototype and built incrementally. Each year since 1995 has included significant milestones for the program:

1995: The JTAV Office was established in June 1995. Development began on the prototype capability and staffing of the office was begun.

1996: In Feb, the first JTAV-IT prototype was deployed to the US European Command (EUCOM), only seven months after the JTAV Office was established. JTAV was deployed to the US Central Command (CENTCOM) in November 96.

1997: JTAV-IT was deployed to the US Atlantic Command (ACOM) [now the US Joint Forces Command (JFCOM)]. A web-based version of JTAV was deployed.

1998: JTAV was fielded to the remaining geographic CINCs in 1998. US Pacific Command (PACOM) and US Forces Korea (USFK) were fielded in March; US Southern Command (SOUTHCOM) and US Special Operations Command (SOCOM) were fielded in October. An additional capability, the National Level Ammunition Capability (NLAC) was developed at the request of the ammunition community to provide a joint ammunition asset capability. The first prototype of this capability was fielded in August 1998. Executive Agency was transferred to DLA in June 98.

1999: In January, phase II of the NLAC capability was fielded. Beta testing of the objective architecture, which uses data mediation and middleware to directly access systems rather than storing copied databases, began in January as well. Significant effort was also spent making JTAV year 2000 (Y2K) compatible.

2000: JTAV received Y2K certification. A System Security Analysis was conducted by the National Security Agency to test and establish a security profile for the Data Synchronization Guard (DSG), which permitted one-way transfer of data from unclassified to classified systems. The DSG is under consideration for use by several DoD and Service systems, but JTAV is the only organization to get NSA testing and approval of it. JTAV also completed the first phase of Public Key Infrastructure (PKI) integration. In response to the DoD IG, the JTAV ORD, APB, and EA were prepared, and an Acquisition IPT was formed to monitor the JTAV program. JPAV prototype was demonstrated to the J1 community, with very positive results. JTAV supported exercises Foal Eagle 99 and the Joint Logistics Warfighting Initiative (JLWI).

3.3.8 Realized Benefits

By many measures, JTAV has been and continues to be a successful program. Appendix B lists significant activities achieved against the program objectives to date. Other examples that JTAV provides benefits to DoD include:

- ◆ There has never been a logistics capability or system listed on any CINC Integrated Priority List (IPL). JTAV now appears not just on one but also on every CINC IPL.¹⁸
- ◆ After action reports from operations in Bosnia-Herzegovina and Kosovo hardly mention logistics, other than to hail Kosovo logistics as a model of efficiency. This is in contrast to those of Desert Shield/Storm, which emphasized the lack of asset visibility. JTAV and other asset visibility initiatives were deployed in support of these later operations and brought asset visibility to the warfighters.
- ◆ The JTAV capability provides a single user the ability to retrieve data from dozens of Service information systems. An In Process Review (IPR) briefing slide from 1997 showed that JTAV accessed fourteen systems with requirements for access to a total of fifty-eight systems as part of the “objective” architecture.¹⁹ At the end of FY00, it is expected that JTAV will have access to 57 of those 58 systems listed in 1997; but with new requirements, added since 1997, for access to at least forty-seven additional systems.²⁰
- ◆ JTAV is now also a data feeder system to six other DoD systems and decision support tools.²¹
- ◆ JTAV is available on a daily basis to thousands of users worldwide to locate assets, check on the status of requisitions, and gather logistics data for planning purposes. Appendix C lists experiences submitted by JTAV users about their experiences with JTAV.
- ◆ Applications to provide the ammunition and personnel communities with their first joint ammunition and personnel visibility capabilities respectively have been separately developed. The ammunition capability is operational. The personnel module is under development. Development and support of both applications, however, has been curtailed or stopped due to budget cuts.

3.4 Reports/Audits/Findings

Numerous reports and audits by the General Accounting Office, DoD Inspector General, and others have reported problems with DoD’s inventory management, logistics, and financial management. This EA examined seventeen such reports with application to asset visibility. Extracts of pertinent passages are summarized in Appendix D.

3.5 What is Sustainment?

The exhaustion of contracts using FY00 funds marks the end of the development period for the JTAV capability. DoD has funded an additional five-year period for the program from

¹⁸ JTAV ORD, 8 Dec 00, p.11.

¹⁹ Briefing Chart, JTAV Major Automatic Information System IPR to the Chief Information Officer, dated 4/9/97

²⁰ JTAV ORD, Dec 8, 2000, Appendix D

²¹ JTAV ORD, Dec 8, 2000, Appendix D

FY 01-05 at a reduced level to “sustain” the capability. A key element of analyzing the alternatives in this EA hinge on what is meant by sustainment as opposed to development.

The concept for sustainment is that the JTAV capability FY00 completed with FY00 funds will be maintained over the next five years, but that no additional functionality will be added. Sustainment of a complex information system in a rapidly changing technical environment will be a challenge.

Using a draft Work Breakdown Structure for Sustainment,²² JTAV briefings, and other sources, sustainment is summarized as those tasks that will:

- ◆ Keep the JTAV capability hardware operational.
- ◆ Keep the JTAV capability updated with current technologies and software releases.
- ◆ Maintain the databases and procedures used to access data.
- ◆ Maintain current agreements for data sharing and implement any pending agreements that are approved during sustainment period.
- ◆ Maintain security controls, technologies, and procedures.
- ◆ Continue to provide user training.

The current JTAV operational architecture relies on accessing and storing extracts and copies of source systems databases on the JTAV servers. These extracts and copies are updated at the same rate the source systems are, but there is an inherent latency in the data. This architecture is often referred to as the “store forward” or “pre-positioned data” approach. One technology solution pursued by the JTAV Office as part of its objective architecture was a database redesign effort that used mediator software and stored procedures to directly access the source systems, run the query, and return the results in near real time. It also provided a more robust “drill down” capability. This data access modernization effort required significant technical work to reconfigure the JTAV databases, data models, and software modifications. This process was successfully implemented on JTAV’s interface with the Global Transportation Network (GTN), and provides JTAV users the same information in near real time that they would get if logged on to GTN.

4.0 Alternatives Considered

The objectives of this report are to evaluate:

²² Detailed Work Breakdown Structure for JTAV Sustainment FY 2001-FY2005 (Draft), 29 Sep 99, prepared for the JTAV Office by Data Networks Corporation. Contract # GS-35F-4380D, Delivery order # Sp4700-98-F-0550 (Mod 05) Task Number 6

1. What is the most cost effective management approach to meet continuing DoD requirements for Total Asset Visibility (TAV) from FY01 through FY05?
2. What are the most beneficial areas for investment to sustain the JTAV capability from FY01- FY05?

These two questions are interrelated but separate issues. Therefore, separate but interrelated alternatives were considered. These were considered in a decision tree sequence, with the first two alternatives (No. 1 and No. 2) evaluating objective #1. Then, given that a decision is made on question #1, alternatives No. 3 and No. 4 provide an evaluation to meet objective #2. Alternatives No. 1 and No. 2 address the management for sustaining the JTAV capability:

4.1 Alternative No. 1 (Status Quo - JTAV Function Continues to be Centrally Managed and Sustained)

The JTAV capability and infrastructure that will have been built as of the end of FY00 will be sustained and maintained through a centralized type of management, regardless of whether the JTAV Office is disbanded at the end of FY00.

4.2 Alternative No. 2 (Decentralize JTAV Sustainment Support)

With the end of JTAV development, one apparent alternative would be turning over the capability to the respective CINCs for management. The JTAV management function will be decentralized and constituencies will individually take on the responsibility for sustaining the JTAV infrastructure and capability within their respective areas of responsibility.

From these alternatives will come a recommendation on who should sustain the JTAV capability. Objective #2 evaluated what the sustainment dollars should be spent on. A significant portion of the approved funding would be spent on personnel, technical, and maintenance costs to operate and maintain the JTAV capability, which were considered non-discretionary. A small portion of the funding was approved for tasks identified by the JTAV Office that this report considered “discretionary.” From this review two alternatives were selected for evaluation:

4.3 Alternative No. 3 (Data Access Modernization)

Under this option, investment of sustainment funds would primarily focus in technology solutions for modernizing data access mechanisms for existing systems accessed by JTAV. This would include using new technologies and methodologies to reconfigure current access mechanisms to reduce data latency. In some cases, access would be rerouted past intermediate systems directly to source systems.

4.4 Alternative No. 4 (Maintain JTAV Capability)

Under this alternative, sustainment funds would be used to continue to maintain the JTAV capability in its current configuration and support customers and training. This includes maintaining JTAV functionality with the FY00 JTAV baseline, continue training for JTAV users, continue JTAV support to the Combatant CINCs and provide integrated, joint sources data for DoD applications such as, GCSS COP CSE, JLACTION, etc. This alternative does not provide for development of new functionality in the JTAV capability but merely maintains the current capability.

5.0 Costs and Benefits

5.1 Costs

The JTAV program has cost DoD, on average, \$13 million per year. Beginning with FY01, the approved funding for the sustainment period will average \$8.75 million annually, a 33% reduction.

5.2 Costs for Program Management Alternatives No. 1 and No. 2

A study of FY00 contracts for the eight organizations, including JTAV, under the DLA e-Business Office used Activity Based Costing methods to assign costs to the twenty-five activities being performed. From that study, the following cost assignments applicable to these alternatives were derived:

<u>Activity</u>	<u>Percentage of Each Dollar Spent</u>	
Program Support Functions	30.88	
Develop EB/EC applications	15.84	
System/Network Support Functions	14.42	
Develop/Execute Testing Services	8.92	
Provide Configuration Management	6.28	
Provide Call Center/Help Desk Services	4.55	
Provide Data Access/Exchange Services		3.43
Implement Data Security	3.32	
Equipment Procurement/Maintenance	1.45	
Develop/Execute Training Services	1.41	
Remaining 15 activities	9.50	
Total	100.00	

These costs broke down into three basic areas: Program Office Operations, centralized JTAV capability support, and CINC on-site support. In general, approximately one third of the budget will go toward operating the JTAV Office, one third will be used for centralized software maintenance, testing, security, and configuration management, and one-third will be used to support the deployed CINC servers and on-site personnel who run the help desks, manage the databases and user accounts, and train personnel. This equates to approximately \$2.88 million annually for each of these three areas during the sustainment period, based on current funding.

5.2.1 Alternative No. 1

The operational concept behind this type of cost structure is one wherein the entire program sustainment function is managed and orchestrated by a single management organization. The support personnel distribution at CINC sites will be basically the same as at the end of FY00. Capital expenditures will be limited to basic equipment repair, software upgrades and license fees. All amount shown in the following tables are in Thousand US Dollars.

Cost Categories	FY2001	FY2002	FY2003	FY2004	FY2005
Program Office Operations	\$3,333	\$3,000	\$3,000	\$2,667	\$2,600
JTAV to CENTCOM (Sustainment)	\$667	\$600	\$600	\$533	\$520
JTAV to EUCOM (Sustainment)	\$667	\$600	\$600	\$533	\$520
JTAV to JFCOM (Sustainment)	\$667	\$600	\$600	\$533	\$520
JTAV to PACOM (Sustainment)	\$667	\$600	\$600	\$533	\$520
JTAV to KOREA (Sustainment)	\$667	\$600	\$600	\$533	\$520
JTAV Program Central Sustainment	\$3,332	\$3,000	\$3,000	\$2,667	\$2,600
TOTAL	\$10,000	\$9,000	\$9,000	\$8,000	\$7,800

5.2.2 Alternative No. 2

The decentralized nature of the sustainment function under this alternative puts the cost burden entirely on the CINCs' organizations. This eliminates the Program Office costs. However, since each CINC will now be responsible for the capability sustainment activities currently performed centrally. The reduced JTAV budget during the sustainment period eliminates any redundancy in personnel skills and represents bare bones staffing to maintain the capability. Therefore, each CINC would have to support a similar staffing level consisting of personnel to perform essential functions such as management, configuration management, security management, testing, training, systems administration, programming, etc. This is in addition to the help desk and support personnel already on-site in each CINC, which will have to continue to be supported as well. The costs for these activities, currently one-third of the JTAV budget, are assigned to each CINC as shown below. All amounts shown in the following tables are in Thousand US Dollars.

Cost Categories	FY2001	FY2002	FY2003	FY2004	FY2005
Program Office Operations	\$0	\$0	\$0	\$0	\$0
JTAV Program Planning	\$0	\$0	\$0	\$0	\$0
JTAV to CENTCOM (Sustainment)	\$4,000	\$3,600	\$3,600	\$3,200	\$3,120
JTAV to EUCOM (Sustainment)	\$4,000	\$3,600	\$3,600	\$3,200	\$3,120
JTAV to JFCOM (Sustainment)	\$4,000	\$3,600	\$3,600	\$3,200	\$3,120
JTAV to PACOM (Sustainment)	\$4,000	\$3,600	\$3,600	\$3,200	\$3,120
JTAV to KOREA (Sustainment)	\$4,000	\$3,600	\$3,600	\$3,200	\$3,120
JTAV Program Central Sustainment	\$0	\$0	\$0	\$0	\$0
TOTAL	\$20,000	\$18,000	\$18,000	\$16,000	\$15,600

5.3 Costs for Capability Sustainment Alternatives No. 3 and No. 4

The costs for these two alternatives use the budgeted amounts for JTAV sustainment as resource constraints. The JTAV budget has between \$2.3 and \$3.0 million annually allocated towards capability sustainment. This includes tasks such as software maintenance, obtaining data feeds, data access modernization, security planning, configuration management, testing, and documentation of these activities, as well as maintenance and operation of the separate test servers used during development.

5.3.1 Alternative No. 3

Alternative No. 3 would use sustainment funds toward achieving the data modernization effort begun in FY00. The focus would be on modernizing the current interfaces with existing data sources, providing users with a capability to reach back and see the same data from the source system at all times. This reduces the latency gap between JTAV's stored data and the source system, as well as provides a more robust drill down capability. Near real time access and drill down capability are two components of many CINC requirements.

5.3.2 Alternative No. 4

Alternative No. 4 would use previously approved sustainment funds toward maintaining the current JTAV capability. Under this alternative, funds would be used to maintain the JTAV capability and focus on customer support.

5.4 Benefits

Under the Information Technology Management Reform Act (ITMRA), DoD is required to design and implement a process for selecting information technology investments using criteria such as risk-adjusted Return on Investment (ROI) and specific criteria for comparing and prioritizing alternative information system projects. Like many other DoD information systems that allow users to make more informed decisions, JTAV has had a very difficult time quantifying the value of the information it provides. The lack of predictable quantifiable benefits to meet ITMRA standards was a major constraint in this study. The Gartner Group, a leading information technology consulting firm, in their review of the JTAV system and objective architectures, shared this opinion. They noted that the JTAV users should define performance metrics for the system, but that with varied users, estimating economic values would be difficult.²³ JTAV is a capability that supports many processes, not a process in and of itself. This makes quantifying the benefits of JTAV difficult. Much of JTAV's benefits are as an intangible service. Intangible goods/services require a different kind of cost/benefit analysis than other goods.

²³ Gartner Group, Department of Defense- Joint Total Asset Visibility Program Office Independent Review of the JTAV Operational and Systems Architecture Executive Report, Jan 2000, p.10.

Congress recognizes this fact in the United States Budget. It defines investment spending as “*spending that yields long-term benefits. Its purpose may be to improve the efficiency of internal Federal agency operations or to increase the Nation's overall stock of capital for economic growth. The spending can be for physical capital, which yields a stream of services over a period of years, or for research and development or education and training, which are intangible but also increase income in the future or provide other long-term benefits.*”²⁴

The US Budget definition mentions education as an investment with intangible but long-term benefits. JTAV servers allow users to gather information from the Service and Agency systems JTAV has access to. This report cannot fully quantify JTAV’s benefit to the total asset visibility agenda of the DoD, because JTAV may save time, save money, or save lives based on how JTAV data is used. The JTAV submitted budgets for approval and decided on system-wide allocations of those funds. The JTAV capability doesn’t replace the need for service systems, but rather brings their information together in one place to allow the user to gain knowledge, and then to apply that knowledge to solve problems and perform tasks.

JTAV-IT has been fielded and supports the CINCs and JTF warfighters. JTAV benefits these users by allowing them to make more informed decisions and perform their operational missions. These benefits are not easily quantifiable. For example, what is the economic value of providing the capability to quickly locate 103,500 human remains pouches that could be, and were, provided to Turkey after a devastating earthquake²⁵ or the value of locating and tracking the movement of Humanitarian Rations moving toward Kosovo refugee camps in direct support of humanitarian relief efforts? The JCS J4 requested that capability and the JTAV functional team took immediate steps to gain access to the database to create the requested visibility for JTAV users. These are two instances in which JTAV provided a significant intangible political, social, and military benefit that would be difficult to quantify rationally. Appendix C contains additional comments submitted by users in the field of how JTAV has benefited them.

Beyond the individual users of JTAV, there is immense intangible cost avoidance savings generated by JTAV as a data source for other systems. Through JTAV, a user or a system, can gain access to information accessed from over thirty DoD information systems. Furthermore, many of these systems, such as the Army Total Asset Visibility (ATAV) system, are themselves aggregate data providers from many additional subordinate systems. In all, a single interface to JTAV can provide access to approximately 80% of DoD asset management systems. JTAV’s data aggregation capability provides significant cost avoidance savings to other systems that need asset information. The Global Combat Support System (GCSS) has included JTAV as one of its family of systems as the asset visibility module. JTAV also provides or has been identified to provide asset visibility information to the DLA Integrated Data Environment (IDE), the Joint Logistics Advanced Concept Technology Demonstration (JLACTD) decision support tools, Integrated Consumable Item Support (ICIS), COP Combat Support Enabled, the Joint Personnel Status Report (JPERSTAT), the Joint Ammunition Management

²⁴ Analytical Perspectives of the Budget of the United States Government, Fiscal Year 2001, p 143.

²⁵ DDAV, 8/24/99, source DISUM

Standard System (JAMSS), and others. Each of these programs plans to leverage their systems off the data available in JTAV. Based on information from DLA, a single interface to a single computer system can cost between \$500,000 and \$1,500,000. Therefore, to access the 30+ systems that JTAV does would cost each program between \$15 and \$45 million. Using JTAV, these programs can access the same data at a fraction of the cost of having each of these systems individually identify, negotiate for, and gain access to the systems already accessed by JTAV. The cost avoidance savings to DoD by using JTAV as a data source depends on the system, the type and complexity of data needed, and the number of systems that eventually use JTAV as a source system. Without JTAV, each of these systems would need to develop and maintain independently their own data feeds from the 25 different source data systems that JTAV accesses.

Asset visibility can result in other tangible savings. The Army Assistant Deputy Chief of Staff for Logistics estimated that better asset visibility could have saved DoD \$2 billion during Operations Desert Shield/Desert Storm.²⁶ Research for this report found seventeen GAO reports and two DoD IG reports that provided applicable findings related to DoD inventory management and procurement, asset visibility, and DoD logistics in general. A synopsis of these reports and their findings are included in Appendix D. Many of these reports listed quantifiable cost benefits and savings estimates for changing DoD business processes, facilitated by JTAV and other TAV initiatives. The GAO reports estimate DoD can save hundreds of millions of dollars in offset procurements and inventory holding costs through better asset management. Most of these reports, however, focus on actions at the wholesale/IMM level. This is where Global JTAV could provide great benefits. However, Global JTAV does not yet exist, and is not scheduled to be completed when development funding ends. Therefore, these benefits will not be realized, and were not considered further for this analysis.

5.4.1 Program Management Alternatives

Benefits of a program management alternative must look at both cost effectiveness and, if costs are equal, what the program objectives are and how well the management decision meets those objectives. These are largely intangible benefits. For these reasons, no Benefit-to-Cost Ratio (BCR) was established for these alternatives.

The program objectives for JTAV are:²⁷

- ◆ Ensure the required level of TAV capability is provided to the CINCs (Commanders-in-Chief), including subordinate Joint Task Force (JTF) Commanders, the Services, and DoD activities.
- ◆ Execute the Defense Total Asset Visibility (DTAV) Implementation Plan.
- ◆ Perform the central role as the functional integrator. It will serve as the proponent for JTAV and will lead and manage the Joint TAV effort DoD-Wide.

²⁶ GAO/NSIAD-99-40, Defense Inventory: DOD Could Improve Total Asset Visibility Initiative With Results Act Framework, Apr 99, p.1.

²⁷ JTAV Charter, from the JTAV website.

- ◆ Ensure that JTAV policies, processes, plans, programs, and procedures are fully synchronized, integrated, and institutionalized.
- ◆ Ensure that the planning and execution of JTAV fully supports DoD's Logistics Strategic Plan.
- ◆ Determine the scope of and requirements for Joint TAV at the wholesale, retail, and tactical levels of logistics.
- ◆ Facilitate, in conjunction with the other functional communities, the appropriate application of logistics-related C4 systems and related enabling technologies to provide JTAV capabilities and process improvements. The goal is to maximize effectiveness and also achieve related cost savings.
- ◆ Refine and clarify user requirements and the JTAV operating concept.
- ◆ Implement JTAV operational and systems architectures.
- ◆ Coordinate JTAV initiatives and funding requirements.
- ◆ Identify JTAV priorities and establish development schedules.
- ◆ Explore and exploit technology to provide a JTAV capability DoD-Wide.

Additionally, the program must support the objectives for the JTAV capability, which are:²⁸

- (a) Be fully deployable and capable of supporting the CINC's and JTF Commanders.
- (b) Be interoperable with legacy and future systems of the Services and Agencies.
- (c) Hardware and applications will operate the same in peace, MOOTW and war. Staffing will be ramped up to sustain higher levels of system availability to support expected increased system demand. Bandwidth requirements will increase as well. Restrictions on use, while not anticipated, could be exercised as required. Refer to paragraph 5 below regarding bandwidth issues.
- (d) Be user friendly. Enterprise changes will be implemented as field operators and planners provide feedback and incorporate CINC specific lessons learned.
- (e) Use existing data elements and databases.
- (f) Support DoD wide joint visibility needs of Service and Agency assets.
- (g) Be compliant with the DII, COE, and JTA.
- (h) Supports GCSS CRD requirements.

²⁸ JTAV ORD, 8 Dec 00, p.20.

- (i) Be timely and accurate.
- (j) Reduce cost and improve efficiency.
- (k) Support garrison, deployed, and non-deploying organizations.
- (l) Place no additional burden on operating forces.

5.4.1.1 Alternative No. 1 (Central Sustainment)

This alternative maintains centralized program management as well as centralized capability sustainment. By default, it is assumed the centralized manager would be in the Washington, DC area and would be the current JTAV Office or an equivalent DoD level organization. Sustainment and maintenance of the JTAV capability would be centrally funded through the management office. The proven benefits of centralized management listed in Appendix D are expected to continue under centralized sustainment.

In its review of the JTAV objective and systems architectures, the Gartner Group pointed to three positive aspects of these architectures:²⁹

- ◆ Data access mechanisms.
- ◆ Understanding of joint data as an asset.
- ◆ Centralized concept decentralized execution.

The benefits of centralized management are:

- ◆ Cost efficiencies.
- ◆ One JTAV POC.
- ◆ Meets all program and capability objectives.
- ◆ Centralized configuration management, security accreditation, software engineering and other sustainment functions ensures each CINC is kept at the same level of interoperability and technology.
- ◆ Large, concentrated pool of technical and management talent in DC area to manage sustainment functions.
- ◆ Meets Gartner Group recommendations: “Successful TAV implementation will require DoD components to control costs, meet scheduled milestones, demonstrate interim successes, and ensure the final product satisfies customer requirements. Cost, schedule, and performance are the primary focus of a Program Management Office, which must be established to ensure that these program functions are accomplished.”³⁰
- ◆ Supports Gartner Group program champion recommendation: “Must have program champion (general officer). The effort required to perform systems management is an enormous effort that

²⁹ Gartner Group Executive Report, Jan 00, p.21.

³⁰ Gartner Group, p. 34

needs a funding line and program champion. The effort to coordinate access control to sources in the objective systems architecture is also an enormous effort requiring a funding line and a program champion.”³¹

- ◆ Supports Gartner Group Critical Success Factors: “TAV...is not only the integration of databases, open architectures, DoD technical standards AISs, and communications networks, but also the integration of functional business processes that has historically operated separately. The JTAV Office must ensure the highest degree of integration throughout the process.”³²
- ◆ Supports Gartner Group recommendation for logistics processes: “even if JTAV continues to be a passive provider of asset visibility data, it is still part of the logistics process. As such, JTAV needs to view itself as a part of the whole DoD enterprise and collect the necessary requirements to ensure that it is operating well within the rest of the enterprise. The goal is to implement a uniform and consistent approach to requirements determination, collection, and validation across the entire JTAV community.”³³
- ◆ After action reports from Bosnia and Kosovo barely mention logistics issues. Asset visibility was greatly improved over Desert Storm for each of those operations. JTAV and other TAV systems are working. Centralized management is meeting objectives.
- ◆ Data is made available to all Services, Agencies, Joint Chiefs of Staff (JCS), DUSD(L) staffs, and also consenting and/or sanctioned coalition forces.
- ◆ The Services and DoD Agencies have a single interface using an agreed upon procedure.
- ◆ Use of JTAV would significantly reduce redundant efforts to develop and maintain numerous interfaces to different systems for the same data. Potential cost avoidance savings for this aspect of using JTAV as a source system are over \$200 million.

5.4.1.2 Alternative No. 2 (Decentralized to CINCs)

With the end of development, this alternative would give the apparent benefit of closing the JTAV Office and saving program overhead costs and allowing the CINCs a more self-directed approach to asset visibility. This significantly under estimates the true potential costs of decentralizing. As shown in section 5.2.2, this alternative will cost an additional \$43.8 million, DOUBLE the current centralized costs to maintain the JTAV capability. There are closing costs for the JTAV office as well.

There are few, if any, tangible benefits for this alternative. Any realized benefits are expected to apply specifically to the CINC organization that performed the sustainment actions. The benefits are therefore localized. Even if the cost to the CINCs is the same as that now under central management, there are numerous opportunities for progress to be lost under this alternative.

Special attention was given to the high risks that go with Alternative No. 2. A decentralized type of JTAV sustainment management will almost surely result in a loss, not a sustainment, of standardization in terms of systems design. The goal of a single, global view will disappear as CINCs focus attention to their individual asset visibility concerns. The risk of the JTAV capability totally disappearing is a real

³¹ Ibid, p.23

³² Ibid, p.33

³³ Ibid, p.13

possibility under Alternative No.2. According to a 1997 GAO Report: “Cultural barriers and parochialism limit opportunities for change.”³⁴ This was seen in the lessons learned from the MMSS system, where cultural barriers and competing requirements first led to de-standardization and eventually the abandoning of the program, at a cost of \$700 million, with little or no results.

This alternative does not meet several of the program and capability objectives. At the program level, the CINCs are not structured to perform the following:

- ◆ Execute the DTAV Implementation Plan.
- ◆ Perform the central role as the functional integrator. It will serve as the proponent for JTAV and will lead and manage the Joint TAV effort DoD-Wide.
- ◆ Ensure that JTAV policies, processes, plans, programs, and procedures are fully synchronized, integrated, and institutionalized.
- ◆ Ensure that the planning and execution of JTAV fully supports DoD’s Logistics Strategic Plan.
- ◆ Determine the scope of and requirements for Joint TAV at the wholesale, retail, and tactical levels of logistics.
- ◆ Facilitate, in conjunction with the other functional communities, the appropriate application of logistics-related C4 systems and related enabling technologies to provide JTAV capabilities and process improvements. The goal is to maximize effectiveness and also achieve related cost savings.
- ◆ Explore and exploit technology to provide a JTAV capability DoD-Wide.

Furthermore, the CINCs would only be able to meet the following objectives on a localized basis in their Areas of Operation.

- ◆ Ensure the required level of TAV capability is provided to the CINCs (Commanders-in-Chief), including subordinate Joint Task Force (JTF) Commanders, the Services, and DoD activities.
- ◆ Determine the scope of and requirements for Joint TAV at the wholesale, retail, and tactical levels of logistics.
- ◆ Refine and clarify user requirements and the JTAV operating concept.
- ◆ Implement JTAV operational and systems architectures.
- ◆ Coordinate JTAV initiatives and funding requirements.
- ◆ Identify JTAV priorities and establish development schedules.

Finally, decentralization at the CINCs carries the risk of losing standardization and common functionality, and the task of managing one of the most complex networks in DoD. The following capability objectives would be at risk under decentralization:

1. Be simple and easy to use.
2. Support the Wholesale logistics item manager’s need for DoD wide visibility of Service and Agency assets.

³⁴ GAO/T-NSIAD/AIMD-97-143, DoD High Risk Areas: Eliminating Underlying Causes Will Avoid Billions of Dollars in Waste, May 97, p.3

3. Be timely and accurate.
4. Reduce cost and improve efficiency.
5. Place no additional burden on operating forces.

The CINC's would also have a difficult time managing the data modernization effort of alternative No. 3, if that proved to be the most efficient use of funds. That effort requires extensive data manipulation and software engineering, which would be difficult for five different CINC's to manage efficiently.

5.4.2 Capability Sustainment

This analysis looked at one, discrete parameter to establish a quantifiable baseline: the expected value of hours saved by JTAV users. A JTAV user may be a supply clerk or a staff officer. This analysis made no attempt to quantify the downstream benefits to DoD of the actions taken as a result of the information obtained, but stresses that they could be significant. For example, if a clerk finds a needed part and gets a deadlined aircraft back in the air two weeks earlier, there are significant benefits generated. Crews are affected, the missions that would have been done by someone else or rescheduled can now be done. Operational capability may be restored. Lives may be saved. This analysis does not attempt to quantify these intangible benefits, but estimates only the clerk's time saved over calling or driving around to see who might have the part he needed.

The tangible benefits of these two alternatives are difficult to quantify. With a calculated cost of approximately \$38 per man hour,³⁵ developing a capability that will save user's time over other methods will save DoD money, allowing that user to perform more tasks in a given time period.

These two alternatives, however, address two constituents in the JTAV community. There are those potential users that don't use JTAV because the data is not real time or can't drill down to the level of detail needed. Likewise, there are potential users who don't use JTAV because it doesn't have visibility over the data they need, regardless of how near real time it is. Investment in either alternative, therefore, is predicted to bring in additional users to the JTAV capability.

For these two alternatives, tangible cost savings have been calculated based on timesavings. The analysis assumed the average person using JTAV on a CINC or JTF staff would be a senior enlisted or mid career officer and uses E-7 and O-4 as representative. Pay and allowances were based on these two grades, both with 14 years experience, as well as an average of the two. These base salaries were then adjusted by factors of 25%, 37%, and 50% to cover costs to DoD such as retirement and medical benefits. These costs vary, so a range between 25 and 50% was chosen.

The following table from Appendix F summarizes the savings.

Table One: Hourly Military Costs that JTAV CAN Potentially Eliminate

Rank	O-4	E-7	Avg.
Low Cost (25%)	\$44.04	\$25.70	\$34.81

³⁵ See Appendix F for detailed calculations.

Unclassified

Avg. Cost (37%)	\$48.14	\$28.17	\$38.15
High Cost (50%)	\$52.70	\$30.84	\$41.77

For cost estimates, the E7/O4 average salary is used and is shown with the three cost adjustment factors. These costs are annotated as follows:

- Avg/low = Average Salary + Low Cost (+25%) adjustment = \$34.81/hr
- Avg/avg = Average Salary + Avg Cost (+37%) adjustment = \$38.15/hr
- Avg/high = Average Salary + High Cost (+50%) adjustment = \$41.77/hr

Potential savings can be estimated with the help of Table One and the report on JTAV Office Requirements Analysis, Integration and Program Support.³⁶

Table Two: Timesaving (hrs)

Time Savings can be in terms of:	Normal Time Savings	Freq. Per Mo.	Total Time	% JTAV Savings	
Requisitions status	1	6	6	50	3
Determine actual inventory level and stock status	1	10	10	50	5
Prepare military or logistics plans	4	1	4	50	2
Locate people and Shipments	1	10	10	50	5
Total					15

Table Three: JTAV Users and Savings (15 Hours Saved per Month)

	Monthly O-4	Annually O-4	Monthly E-7	Annually E-7	Monthly Avg	Annually Avg
Rank						
Low (25%)	\$60.57	\$7,926.84	\$385.48	\$4,625.72	\$ 522.15	\$6,265.78
Avg (37%)	\$722.05	\$8,664.66	\$422.48	\$5,069.81	\$ 572.27	\$6,867.28
High (50%)	\$790.57	\$9,486.84	\$462.58	\$5,550.94	\$ 626.58	\$7,518.94

The following tables assume the potential savings if everyone used their accounts. They show the savings associated with estimates growth rates in the number of JTAV accountholders of 10%, 15%, and 25% annually. At the present time, however, approximately 20% of the total users, on average, use their JTAV accounts in any given month. This figure includes contractors. The current savings are, therefore, only 20 percent of the predicted savings.

Table Four: Annual Savings (in 000's) Based on 10% Growth in Number of Users

	FY01	FY02	FY03	FY04	FY05	Total FY01-05
Users (10% Growth)	2500	2750	3025	3325	3660	

³⁶ Prepared by: Data Networks Corporation 1840 Michael Faraday Drive, Suite 240 Reston, VA 20190-5338.

Avg/Low	\$15,664	\$17,231	\$18,954	\$20,834	\$22,933	\$95,616
Avg/Avg	\$17,168	\$18,885	\$20,774	\$22,834	\$25,134	\$104,795
Avg/High	\$18,797	\$20,677	\$22,745	\$25,000	\$27,519	\$114,739

Table Five: Annual Savings (in 000's) Based on 15% Growth In Number of Users

	FY01	FY02	FY03	FY04	FY05	Total FY01-05
Users (15% Growth)	2500	2875	3305	3800	4370	
Avg/Low	\$15,664	\$18,014	\$20,708	\$23,810	\$27,381	\$105,578
Avg/Avg	\$17,168	\$19,743	\$22,696	\$26,096	\$30,010	\$115,714
Avg/High	\$18,797	\$21,617	\$24,850	\$28,572	\$32,858	\$126,694

Table Six: Annual Savings (in 000's) Based on 25% Growth In Number of Users

	FY01	FY02	FY03	FY04	FY05	Total FY01-05
Users (25% Growth)	2500	3125	3905	4880	6100	
Avg/Low	\$15,664	\$19,581	\$24,468	\$30,577	\$38,221	\$128,511
Avg/Avg	\$17,168	\$21,460	\$26,817	\$33,512	\$41,890	\$140,848
Avg/High	\$18,797	\$23,497	\$29,361	\$36,692	\$45,866	\$154,213

5.4.2.1 Alternative No. 3 (Data Modernization)

This alternative continues working toward an objective architecture to provide more, near real time information retrieved directly from source systems through several complex data access mechanisms. This applies to access on unclassified systems and classified systems, as well as JTAV’s efforts with the National Security Agency (NSA) and the Defense Information Systems Agency (DISA) to certify a secure technological solution that will transfer data from unclassified to classified systems.

This alternative moves toward the DoD Logistics Strategic Plan requirement of near real time data. As little data as possible is warehoused on the JTAV servers, although more static data may remain stored. This alternative requires reworking existing interfaces.

This alternative is already being done on a limited basis in JTAV. The interface with GTN using the enhanced transportation feature on JTAV allows users to access GTN operational databases and retrieve in-transit data in near real time.

This alternative, however, relies on a technological data mediation solution. The data mediation product being used was evaluated by the Gartner Group and found to be “not mature, unproven, and too risky for the JTAV program. Security is still an issue. No viable solution exists yet to allow classified systems to request data across the firewall and receive an answer back from the unclassified (SBU) side.”³⁷

³⁷ Gartner Group, p.24.

The Gartner Group also noted that “there is no comparable real-world example of this architecture to validate its design, and that the reach back mediation approach, is not practical in the DOD environment.”³⁸ The Gartner Group also had concerns about the communications required to sustain modernized data access. They noted, “The JTAV Office must recognize existing communication limitations and build appropriate architectures to support JTAV.”³⁹ Their recommendations, in summary, were for the JTAV Office to review and enhance its architectures and develop prototype capabilities using these new technologies prior to full scale fielding. This alternative cannot speed up the cycle times of the source systems themselves, only narrow the delay between the system update and when it is available on JTAV. A system that updates daily will still have day old data, regardless of how fast you access it

5.4.2.2 Alternative 4

This alternative focuses on maintaining the JTAV capability and providing customer support. The support includes training, CINC support, and DoD application source data. User statistics show that currently, only about 20% of the JTAV account holders actually use the capability in a given month. This causes a significant gap between the realized savings and the potential savings. Part of this alternative is the recommendation for investment of funds to develop a process for surveying account holders and determining the causes for not using the capability (i.e. not robust enough, data latency, drill down, etc).

6.0 Comparison of Alternatives

6.1 Gaps Unaffected by Alternatives

When the JTAV development period ends, there are some goals and objectives that will not be met, and are unaffected by any alternative: the JTAV capability will remain a theater-centric based capability; the objective of providing Global JTAV worldwide asset visibility information through a single JTAV query is still developmental; and the CINC servers are not linked to provide a fused global picture. Due to budget cuts in FY00, additional development of the personnel module and ammunition capability was eliminated. The ammunition capability is operational. The personnel module is not. JTAV will not have access to several major areas needed, particularly maintenance at all levels, and key assets at the wholesale level. Without wholesale or procurement, end-to-end visibility is not achievable. JTAV currently provides visibility to approximately 75-80% of DOD owned assets. The remaining 20-25% is in personnel, maintenance, procurement, and direct vendor delivery.⁴⁰ The requirement for the integration of JTAV into other applications and vice versa is unfunded. Sustainment tasks will require skilled database, software, network, and operational talent.

6.2 JTAV Management (Alternatives No. 1 and No. 2)

³⁸ Ibid, p. 22-23.

³⁹ Ibid, p. 33.

⁴⁰ Data from briefing to Dr. Hamre, Deputy Secretary of Defense, 8 Jul 99. Presented by COL Frazier.

6.2.1 Comparative Analysis

The benefits were measured against how well the alternative meets the DoD TAV objectives.

Charter Requirement	Centralized Office	Decentralized Office
Ensure the required level of TAV capability is provided to the CINCs (Commanders-in-Chief), including subordinate Joint Task Force (JTF) Commanders, the Services, and DoD activities.	Yes, to all CINCs	Yes, to themselves
Ensure that JTAV policies, processes, plans, programs, and procedures are fully synchronized, integrated, and institutionalized.	Yes	Possibly, but with more complexity
Facilitate, in conjunction with the other functional communities, the appropriate application of logistics-related C4 systems and related enabling technologies to provide JTAV capabilities and process improvements. The goal is to maximize effectiveness and also achieve related cost savings.	Yes	Possibly, but with more complexity.
Execute the DTAV Implementation Plan.	Yes	No
Refine and clarify user requirements and the JTAV operating concept.	Yes	Yes, for their own users
Implement JTAV operational and systems architectures.	Yes	Partially, for their AO
Ensure that the planning and execution of JTAV fully supports DoD's Logistics Strategic Plan.	Yes	No
Determine the scope of and requirements for Joint TAV at the wholesale, retail, and tactical levels of logistics.	Yes	Partially, retail and tactical for their AO
Perform the central role as the functional integrator. It will serve as the proponent for JTAV and will lead and manage the Joint TAV effort DoD-Wide.	Yes	No
Identify JTAV priorities and establish development schedules.	Yes	Yes, but for each CINC
Explore and exploit technology to provide a JTAV capability DoD-Wide.	Yes	No, not DoD wide
Coordinate JTAV initiatives and funding requirements.	Yes	Partially, will do so for their JTAV piece.

Also, how well the JTAV capability objectives will be sustained by that organization.

JTAV Capability Requirements	Central Office	Decentralized Office
Be fully deployable and capable of supporting the CINCs, and JTF Commanders by being interoperable with the Services and Agencies legacy and future systems.	Yes	Yes, but only for the regional CINC. May not remain interoperable among CINCs
Operate the same in both peace and war.	Yes	Yes
Be simple and easy to use.	Yes	Maybe, depends on what changes the CINCs make
Use existing data elements and databases.	Yes	Yes
Support the wholesale logistics item manager's need for DoD wide visibility of Service and Agency assets.	No (but plans to)	No (CINCs not likely to get into wholesale business voluntarily)
Be compliant with the GCSS CRD, the Defense Information Infrastructure Common Operating Environment (DII COE), and the DoD Joint Technical Architecture.	Yes	Maybe. Risk is that CINCs will use different standards.
Be timely and accurate.	Yes	Yes, for their AO
Reduce cost and improve efficiency.	Yes	No
Support garrison, deployed, and non-deploying	Yes	Yes, for their AO

organizations.		
Place no additional burden on operating forces.	Yes	No. Will probably tax CINC logistics and IT staffs.

6.2.2 Discussion of Alternative No. 1

Maintaining centralized control of the JTAV sustainment process is clearly the most cost efficient and preferred solution. Interoperability and standardization are maintained. The capability will maintain the same “look and feel.” The Services and Agencies will deal with one organization that will address their requirements. Activities are done once, instead of five different times. The CINCs remain focused on warfighting, not program management. A centralized management concept will perpetuate the huge gains already made, not only technically, but also in breaking old paradigms and fostering the joint cooperation needed to bring this capability to the CINCs.

6.2.3 Discussion of Alternative No. 2

Alternative two has the advantage of retaining the individuality of the CINCs. It is this advantage that makes alternative two a costly alternative. This analysis estimates that alternative two will cost an additional \$43.8 million during the sustainment period. Decentralizing asset visibility would be a step back to pre-modern business practices instead of a leap forward to the DLA’s goal of modern business solutions. The benefits from a central office are lost. One of those major benefits is the JTAV Office standardized data access process. Instead of a single office, each CINC and military service will have to coordinate and establish agreements with each other. This creates a complex web of interfaces and agreements among the components often briefed by JTAV as “the spaghetti chart.” Further there are two primary audiences for visibility data. There are the war fighters and the wholesale community. It is not clear how the CINCs could deal with the wholesale community. An integrated approach is needed to serve both communities. The CINCs’ priorities are often at odds with the wholesale community’s. There is increased risk that the benefits of asset visibility will be lost under a decentralized environment.

The decentralization alternative is not “clearly equal to or better than alternative uses of available public resources” as stated in the US Budget. It was not possible in light of project objectives and the Federal Government’s insistence on not only performing efficiently, but better than all other options, to recommend a decentralization of total asset visibility. In essence, an asset or service is not efficient unless it does the best possible job at the lowest possible cost. Decentralization will cost twice as much while at the same time jeopardizing nearly half of the program objectives for the JTAV program. Therefore, decentralization cannot meet the criteria for providing the highest overall value to DoD at the lowest possible cost.

6.3 JTAV Capability Sustainment (Alternatives No. 3 and No. 4)

6.3.1 Comparative Analysis

JTAV Capability Requirements	Data Modernization	Maintain JTAV Capability
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Be fully deployable and capable of supporting the CINCs, and JTF Commanders by being interoperable with the Services and Agencies legacy and future systems;	Yes, but more complex interfaces	Yes
Operate the same in both peace and war;	Yes	Yes
Be simple and easy to use;	Yes, but more complex to maintain	Yes
Use existing data elements and databases;	No. Databases would require reconfiguration and software modifications	Yes
Support the wholesale logistics item manager's need for DOD wide visibility of Service and Agency assets;	No	No
Be compliant with the GCSS CRD, the Defense Information Infrastructure Common Operating Environment (DII COE), and the DOD Joint Technical Architecture;	Yes	Yes, the goal of GCSS is interoperability, which requires mediated access to source data. JTAV has limited reach back capability
Be timely and accurate;	Yes, data is near real time and same as source.	Maybe. Data is pulled or pushed, so latency is encountered. Data is only as accurate as last provided update.
Reduce cost and improve efficiency;	Yes, will attract more users	Yes, will attract more users
Support garrison, deployed, and non-deploying organizations, and	Yes	Yes
Place no additional burden on operating forces.	Yes	Yes

6.3.2 Discussion of Alternative No. 3

The limited sustainment budget available and the Gartner Group’s recommendations, make this a risky alternative with limited benefits to a group of users who actually require faster data latency.

Sustainment functions should keep the current stored data access mechanisms up to date with current technology over the sustainment period. The effort required to rework data interfaces and to maintain an added layer of complexity with a risky and unproven product makes this alternative less effective and more likely to have cost overruns than alternative No. 4.

6.3.3 Discussion of Alternative No. 4

This alternative is preferred over alternative No. 3 for several reasons:

- ◆ It has a higher probability of success without cost overruns or schedule slips.
- ◆ Savings are realized when more people use the system because they are trained and have better support. Currently only 20% of account holders use JTAV, and those account

holders represent a small part of the potential user population. This alternative emphasizes training to satisfy new and existing users. Surveys conducted under this alternative could determine the community's need for training.

- ◆ It continues to support DoD applications such as GCSS COP CSE, JLAOTD, etc. JTAV provides a single source for joint logistics data versus each application having to broker access to several logistics systems.

6.4 Benefits Summary

This section presents the qualitative and quantitative Program benefits for each alternative.

6.4.1 Qualitative Benefits

The need for total asset visibility has long been recognized. It has been a key objective of the Department of Defense, and is one of six focus areas and measures of performance in the FY00 Defense Logistics Strategic Plan.⁴¹ The use of TAV as a metric only proves that the Defense Department sees intrinsic value in simply having knowledge about the current condition, status and location of assets. Due to this nature of JTAV, its benefits are known to be obvious but at the same time difficult to quantify. It provides knowledge, which in turn facilitates timely decisions. It is a big challenge to predict exactly how many dollars can be saved with the use of the capability. It is difficult to attach fixed revenue per unit of this "product." Its power can be used to save one life, or a thousand lives depending on the circumstances. The benefits are intangible and definitely not insignificant.

The value of immediate access to information is unique. It is akin to the value of knowledge itself. Over 80% of logistics is based on manipulating information about the product, not the product itself.⁴² The real value of the JTAV capability lies in its ability to provide quick and reliable fused asset information, resulting in immediate recognition of problems and opportunities. The immediate outcome is the creation of a large number of well-informed decision makers who can make timely decisions because of the JTAV capability.

6.4.2 Quantitative Savings and Benefits

Appendix E contains the detailed explanation on how benefits were quantified and computed in this study. Alternatives No. 1 and No. 2 were evaluated based on qualitative criteria. Quantitative savings were computed for evaluating alternatives No. 3 and No. 4. Dollar benefits are expressed in terms of "Expected Values" due to the ad-hoc nature of most benefits that can be derived from the JTAV infrastructure and its capability.

⁴¹ FY2000 DOD Logistics Strategic Plan, Aug 99, from the web (<http://web.deskbook.osd.mil/reflib/MDOD/001DA/001DADDOC.HTM>)

⁴² Comments by Rear Admiral Archer, Deputy Director DLA, Dec 2000

Appendix E presents a range of cost savings, based on various assumptions and growth rates. The total **potential** savings, expressed in terms of manpower costs and adjusted for NPV, ranges from \$64.9 to \$177.4 million over the five year sustainment period. This represents a **potential ROI** for the \$43.8 million (\$40.2 million NPV) sustainment budget of **between 1.61 and 4.41**. However, user statistics show that only about 20% of registered account holders use the system regularly. This reduces the real manpower savings by 80%, to between \$13.0 and \$35.5 million, which results in a **real ROI**, if nothing changes, of **only .32 to .88**.

This ROI **does not include** the cost avoidance savings to DoD of having JTAV as a source data system for other systems, programs, and decision support tools that need asset information. Those cost avoidance savings, based on JTAV's access to over 80% of DoD logistics systems through a single interface, are between \$15 and \$45 million **per program**. With seven programs already identified as wanting to use JTAV, potential cost avoidance savings of \$105 to \$315 million and an **additional ROI of 2.6 to 7.8** are already being realized. .

7.0 Sensitivity and Uncertainty Analysis

7.1 Alternatives No. 1 and No. 2

The analysis of alternatives No. 1 and No. 2 was based on current centrally managed costs and qualitative benefits. It was not possible or practical to get specific costs for each service for each CINC under alternative No. 2. Levels of commitment, availability of skilled personnel, and CINC staff capabilities all impact on the sensitivity of costs associated with alternative No. 2. However, even if all costs are equal, or even less than centralized management, alternative No. 2 still fails to meet several key DoD objectives for asset visibility. In this respect, the alternatives are sensitive only if the objectives for the JTAV program or DoD's overall initiative for Total Asset Visibility change.

7.2 Alternatives No. 3 and No. 4

Tangible cost benefits from offset procurements, lowering inventory costs, transportation cost savings, and other actions are possible and have been achieved using JTAV. However, there is not an efficient or comprehensive method or metric to capture and document such benefits. The GAO found numerous examples of cases where, had asset visibility been better or even used, millions of dollars would have been saved. These tangible benefits, along with the intangible benefits provided by JTAV, are significant, but were not considered in this analysis.

Alternative No. 3 relies on technological solutions and emerging products. This alternative is sensitive to schedule slippage, technology hurdles, and other unforeseen problems that increase the uncertainty of remaining on time and within budget. There is uncertainty as to the numbers of new users this alternative will attract or retain.

Alternative No. 4 relies on maintaining current processes and focusing on supporting training for new and current JTAV users. The uncertainty risk is greatly reduced by the shift away from emerging

technologies. This alternative focuses on a broad population, and benefits would accrue even if a small percentage of that population uses the capability.

Both alternatives are sensitive to the number of JTAV users and to the actual amount of time JTAV saves them. The benefits to DOD increase as more users use the capability. Since both alternatives use the same costs, a quick breakeven analysis was done to find out what constant number of annual hours saved, number of users (based on 15 hr/mo savings) and utilization rates (based on projected growth rates) would offset the annual budget for each year of sustainment. The results are as follows:

Table Seven: Breakeven Analysis

	Budget (\$)		# Of accounts (10% growth)	# Of accounts (15% growth)	# Of accounts (25% growth)
FY01	\$10 million		2500	2500	2500
	Breakeven Hours/yr.	Breakeven Users/mo.	Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates
Avg/Low	287,275	1596	63.8%	63.8%	63.8%
Avg/Avg	262,112	1456	58.2%	58.2%	58.2%
Avg/High	239,396	1330	53.2%	53.2%	53.2%
			# Of accounts	# Of accounts	# Of accounts
FY02	\$9 million		2750	2875	3125
	Breakeven Hours/yr.	Breakeven Users/mo.	Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates
Avg/Low	258,547	1436	52.2%	49.9%	46.0%
Avg/Avg	235,901	1310	47.6%	45.6%	41.9%
Avg/High	215,456	1196	43.5%	41.6%	38.3%
			# Of accounts	# Of accounts	# Of accounts
FY03	\$ 9 million		3025	3305	3905
	Breakeven Hours/yr.	Breakeven Users/mo.	Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates
Avg/Low	258,547	1436	47.5%	43.4%	36.8%
Avg/Avg	235,901	1310	43.3%	39.6%	33.5%
Avg/High	215,456	1196	39.5%	36.2%	30.6%
			# Of accounts	# Of accounts	# Of accounts
FY04	\$8 million		3325	3800	4880
	Breakeven Hours/yr.	Breakeven Users/mo.	Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates
Avg/Low	229,820	1277	38.4%	33.6%	26.2%
Avg/Avg	209,690	1165	35.0%	30.7%	23.9%
Avg/High	191,516	1064	32.0%	28.0%	21.8%
			# Of accounts	# Of accounts	# Of accounts
FY05	\$7.8 million		3660	4370	6100

	Breakeven Hours/yr.	Breakeven Users/mo.	Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates
Avg/Low	224,074	1245	34.0%	28.5%	20.4%
Avg/Avg	204,448	1135	31.0%	26.0%	18.6%
Avg/High	186,729	1037	28.3%	23.7%	17.0%

8.0 Results and Recommendations

8.1 Program Management

This analysis clearly favors Alternative No. 1 and maintaining a centralized management of the JTAV capability. A cost avoidance of \$43.8 million is realized with this alternative. The qualitative benefits to DoD strongly favor maintaining the gains made by the JTAV Office over the past five years. The most logical and cost effective recommendation is to keep the current JTAV Office “team” in place, subject to sustainment budget constraints. However, centralized management under any DoD agency capable of performing the program management and sustainment functions is preferred to decentralized sustainment.

8.2 Capability Sustainment

While both alternatives meet DoD requirements, alternative No. 4 is recommended. The limited sustainment budgets available and the Gartner Group’s recommendations, make alternative No. 3 a risky alternative with limited benefits. With only 20% of JTAV account holders actually using the system, alternative No. 4 recommends methods to train users and determine why account holders are not using the system.

9.0 Appendices

Appendix A: References

Appendix B: Listing of JTAV Accomplishments

Appendix C: Intangible Benefits: Stories from the Field

Appendix D: Summary of GAO comments

Appendix E: Technical Appendix of Calculations and Formulas

Appendix F: IPT Comments and Replies

Appendix A: References

Audit Report, Inter-service Availability of Multi-service Used Items (Report No. 99-159), Office of the Inspector General, Department of Defense, May 14, 1999

Defense Total Asset Visibility Implementation Plan, November 1995

Department of Defense Instruction No. 7041.3, Economic Analysis for Decision-making, November 7, 1995

Office of Management and Budget (OMB) Circular No A-94, October 29, 1992
(Appendix C containing discounting rates updated January 1999)

Defense Logistics Agency (DLA) Information Technology Investment Economic Analysis and Documentation Manual (Draft copy).

Department of Defense Directive 5000.2-R, Mandatory Procedures for MDAPs and MAIS Acquisition Programs, (Includes Change 4), May 11, 1999

Department of the Army Cost Analysis Manual, U.S. Army Cost and Economic Analysis Center, July, 1997

Department of Defense Logistics Strategic Plan, August 1999

Defense Logistics Agency Strategic Plan, 1999

JTAV Operational Requirements Document (ORD), November 1999

JTAV Acquisition Program Baseline (APB), November 1999

Appendix B: Listing of JTAV Accomplishments

The JTAV Office has already met many of its DoD assigned objectives. The following review of the objectives lists specific examples of JTAV's compliance with each requirement.

Ensure the required level of TAV capability is provided to the CINCs (Commanders-in-Chief), including subordinate Joint Task Force (JTF) Commanders, the Services, and DoD activities.

- ◆ Each geographic CINC (EUCOM, PACOM/USFK, CENTCOM, JFCOM, and SOUTHCOM/SOCOM) has an unclassified and classified server hosting the JTAV capability and tailored to their specific data requirements.
- ◆ Each CINC also has an on-site team provided by the JTAV Office to provide training, database administration, and help desk support for the JTAV capability.
- ◆ Each CINC has maintenance and licensing agreement provided by the JTAV Office to support the JTAV capability.
- ◆ JTAV supports or will support a majority of the 129 consolidated CINC requirements identified by the Global Command and Control System (GCSS) Functional Requirements Office.
- ◆ Specific capability has been added as needed by the CINCs to support operations and exercises. In one instance, a software patch was installed only 6 days after a query problem was reported to the help desk.

Execute the DTAV Implementation Plan.

- ◆ JTAV has focused on the CINC/JTF portion assigned to it.
- ◆ JTAV has established data access mechanisms to query the other TAV components, including DAAS for requisition status, and GTN for in-transit visibility status from within the JTAV application.

Perform the central role as the functional integrator. It will serve as the proponent for JTAV and will lead and manage the Joint TAV effort DoD-Wide.

- ◆ The JTAV Office has provided oversight and leadership in overcoming cultural barriers and parochialism to provide a joint capability that is recognized as critical on seven CINC Integrated Priority Lists and forms a cornerstone capability for the GCSS system, as well as a key enabler for achieving the tenets of Focused Logistics and Joint Vision 2020.
- ◆ JTAV's role as central functional integrator was never fully embraced by all members of the TAV community, and was essentially transferred to the Joint Staff J4 with the creation of the GCSS Functional Requirements Office. However, the JTAV Office is still the proponent for leading and managing the JTAV effort DoD-wide.

Ensure that JTAV policies, processes, plans, programs, and procedures are fully synchronized, integrated, and institutionalized.

- ◆ JTAV has worked closely with DLA, the Joint Staff, the services, Defense agencies, and the CINCs to ensure the JTAV capability is both technically and functionally compliant with requirements.
- ◆ JTAV is Defense Information Infrastructure Common Operating Environment (DII COE), Y2K, and Joint Technical Architecture compliant.
- ◆ The JTAV capability is synchronized and supports GCSS requirements, including the GCSS Mission Needs Statement (MNS) and Capstone Requirements Document (CRD).
- ◆ As a joint capability, JTAV has the implied mission as a data broker or “universal logistics translator” for the Services and Agencies. JTAV has established a standardized data access methodology to gain access to data using Memorandums of Agreement, Data Sharing Agreements, and Data Sharing Specifications. These documents provide the functional and technical “contracts” which bind both parties to sharing data.
- ◆ A JTAV brief and demonstration has been permanently added to the curriculum of the Joint Course on Logistics (JCL) at Ft. Lee, VA. The first brief and demonstration given on December 14, 1999
- ◆ JTAV is specifically identified to provide support to the Global Combat Support System (GCSS) in the approved GCSS Mission Needs Statement (10 Sept 97). JTAV’s functions will support all three GCSS operational elements. Which include: joint warfighting, force preparedness, and life cycle management. The GCSS MNS includes the following justification:

This Mission Need Statement (MNS) responds to the Defense Planning Guidance (DPG), FY 1999-2003, Section IID, titled, “Preparing Now for the Future —Transforming DoD.” The following guidance is extracted from the DPG:

*“Joint Vision 2010 embraces information superiority and the technological advances that will transform traditional warfighting via new operational concepts . . . [and] will lead U.S. forces to increased jointness and military effectiveness.... Focused logistics integrates information superiority and technological innovations to develop state-of-the-art logistics practices and doctrine. Initiatives such as **Joint Total Asset Visibility** and the Global Combat Support System will provide . . . information systems for leaner, more responsive logistics.”*

- ◆ This capability implements the joint asset visibility component of Information Fusion, a tenet of Focused Logistics, one of four cornerstone operational concepts in Joint Vision 2010.

JTAV synergistically supports at least two Focused Logistics Desired Operational Capabilities (DOC) expressed in the Joint Vision Implementation Master Plan (Dec 98):

1. FL-01: Provide Unimpeded Access to Operational and Logistics Information for All Who Need It
2. FL-04: Provide Timely and Accurate Enhanced Asset Visibility, Control, and Management

Ensure that the planning and execution of JTAV fully supports DoD's Logistics Strategic Plan.

◆ **Links to the Defense Logistics Agency Strategic Plan**

The proposed investment directly contributes to the current mission performance of the DLA and also supports essential customer-oriented initiatives within the Agency. Either as Executive Agent, or as the investment proponent, the DLA's involvement in the JTAV Program planning clearly falls within the scope and direction of the Agency's corporate mission and Strategic Plan. The specific goals and objectives that benefit from this involvement are as follows:

Goal #1: Consistently provide responsive, best value supplies and services to our customers

- Objective # 7: Increase the percentage of conforming items (right items)
- Objective # 8: Improve the percentage of on-time deliveries by 5% (right time)

Goal #4: Rapidly exploit technology to provide agile, responsive, interoperable solutions.

- Objective # 3: Upgrade our technology base to be 100% compliant with the DII COE policies and standards by FY01.
- Objective # 5: Deploy Web technologies and interfaces with our systems and databases by the end of FY02.

- ◆ The link to a higher-level DoD objective is more direct. In the meeting of the Logistics Reform Senior Steering Group (LRSSG) on June 1, 1999, the six (6) sets of Objectives and Measures for the 1999 DoD Logistics Strategic Plan were defined. One of them is to "Fully implement joint Total Asset Visibility (TAV) across DoD." With the LRSSG-defined measure being: "Determine user/business method asset information requirements and associated measures by the end of FY2000, implement 100% of requirements by the end of FY2006." The DoD Logistics Strategic Plan also states that one of its critical success indicators is its ability to "Guarantee joint total asset visibility through fully integrated, secure information systems."
- ◆ Total Asset Visibility is a key tenet of both the Chairman of the Joint Chiefs of Staff's (CJCS) Focused Logistics elements of Joint Vision 2010 and the DUSD(L)'s Logistics Strategic Plan. The JTAV concept, which is assigned a high priority in the DoD Logistics Strategic Plan, is thoroughly documented in the original Defense Total Asset Visibility Implementation Plan, dated November 1995. Satisfying user requirements in four areas comprise the essence of the JTAV Program: 1) visibility of assets in-storage or in-process, 2) requisition tracking, 3) visibility of assets in-transit, and 4) logistics management within a theater of operations.

JTAV has demonstrated the feasibility of acquiring asset status data from the systems of record of the DoD components and fusing the data into asset visibility management information in support of JTF planning and operations. Concurrent with fielding the proof of concept capability to each CINC and the migration to a web based environment, JTAV has also identified for DoD the essential shared asset data elements as well as their authoritative source information system and alias within that system. This data management construct will be used beyond JTAV to support the continued sharing of essential data between the Military Departments and Agencies and the elements of the Joint Task Forces.

- ◆ The Logistics Strategic Plan calls for near real time data. The JTAV objective architecture is working toward data access mechanisms to provide that capability.
- ◆ JTAV's Strategic Plan is closely matched to the DLA Logistics Strategic Plan, which in turn, was found by the GAO to be the only agency whose plan was linked to DoD's⁴³.

Determine the scope of and requirements for Joint TAV at the wholesale, retail, and tactical levels of logistics.

- ◆ JTAV initially developed a Functional Requirements Document in 1997.
- ◆ The JTAV Office has hosted an annual user's conference to discuss user requirements and gather user input for future development requirements.
- ◆ The GCSS FRO conducted a data call and compiled an approved list of 129 CINC requirements. The JTAV capability supports a majority of these requirements.
- ◆ The JTAV Office has participated in numerous seminars, In Process Teams (IPTs) and other forums to address user requirements.

Facilitate, in conjunction with the other functional communities, the appropriate application of logistics-related C4 systems and related enabling technologies to provide JTAV capabilities and process improvements. The goal is to maximize effectiveness and also achieve related cost savings.

- ◆ JTAV is not only a data collection capability, but has worked with DARPA, the Joint Staff, and the CINCS to feed asset visibility data to emerging applications and decision support tools.
- ◆ JTAV's incremental development has enabled it to take advantage of emerging technologies. A review by the Gartner Group, a leading information technology consulting firm, noted that there is no comparable government or commercial architecture that compares to JTAV.
- ◆ JTAV and the Assistant Commandant for Systems, USCG, on January 6, 2000 signed an agreement to share logistics data.⁴⁴ JTAV is the bridge between the Department of Defense

⁴³ GAO Report NSIAD 97-28, Logistics Planning: Opportunities for Enhancing DOD's Logistics Strategic Plan, Dec 96, p.5.

and the Department of Transportation. JTAV assures accurate and timely information required to execute joint military operations.

Refine and clarify user requirements and the JTAV operating concept.

- ◆ JTAV participates in ongoing IPTs to refine and clarify user requirements.
- ◆ The JTAV Office works closely with the GCSS FRO, the services and agencies to identify requirements and data sources to meet those requirements.

Implement JTAV operational and systems architectures.

- ◆ The JTAV-IT architecture is in place and operating.
- ◆ The objective architecture is being tested on several test systems.
- ◆ The Gartner Group was hired to perform an independent evaluation of the operational and objective system architectures.

Coordinate JTAV initiatives and funding requirements.

- ◆ The JTAV Office continues to coordinate JTAV initiatives with the Joint Staff, DLA, DUSD(L) and others. Examples include coordinating the JTAV ORD with the GCSS CRD, developing the JTAV Acquisition Program Baseline and the EA.
- ◆ The JTAV Office has received reduced funding for sustainment operations for FY01 through FY05.

Identify JTAV priorities and establish development schedules.

- ◆ JTAV initially developed prioritized development and fielding plans and has met them.
- ◆ JTAV's rapid prototype development approach has allowed the JTAV Office to be flexible in meeting unforeseen requirements. These have included support to Kosovo and Bosnia, development of the ammunition and personnel capabilities, support to several joint exercises, and adaptation to emerging technical requirements such as the DII COE and DISA's Common Operating Picture (COP).

Explore and exploit technology to provide a JTAV capability DoD-Wide.

- ◆ JTAV has explored and exploited technology at many levels.
- ◆ Using encrypted browser technology, JTAV is web accessible.
- ◆ As noted by the Gartner Group, there is no comparable architecture in either the civilian or government realms.

⁴⁴ JTAV, 1/7/00, source DISUM

- ◆ JTAV works closely with vendors, certifying and testing agencies and independent auditors to test and certify emerging products for use in JTAV.

The JTAV capability also meets its established objectives:

Be fully deployable and capable of supporting the CINCs, and JTF Commanders by being interoperable with the Services and Agencies legacy and future systems.

- ◆ JTAV provides each CINC visibility of assets in his theater of operation, as well as some assets on a global basis.
- ◆ JTAV is web based and can be accessed anywhere deploying troops can access the Internet. If not access is possible, the regional help desks at each CINC can run queries and provide the answers to the users if needed.

Operate the same in both peace and war.

- ◆ JTAV operates now with real world data, and provides the same picture as the source systems, regardless of level of combat.

Be simple and easy to use.

- ◆ Being Web based, most users quickly master the queries they need. Online tutorials and Computer Based Training (CBT) enhance the users level of proficiency.

Use existing data elements and databases.

- ◆ JTAV accesses service and agency systems. Data is either pushed or pulled from those source systems, depending on the system. Some systems provide near real time access through stored procedures hosted directly on the source system.

Support the wholesale logistics item manager's need for DoD wide visibility of Service and Agency assets.

- ◆ JTAV has limited wholesale visibility at this point. The demise of the MMSS systems created a void that JTAV is striving to fill. However, this functionality will not be in place when JTAV goes under sustainment funding in FY01.

Be compliant with the GCSS CRD, the Defense Information Infrastructure Common Operating Environment (DII COE), and the DoD Joint Technical Architecture.

- ◆ JTAV is compliant with all three of these requirements.

Be timely and accurate.

- ◆ JTAV query response times vary based on the type of query. However, most queries can be returned in less than one minute.
- ◆ Data accuracy is the responsibility of the source system. The GAO has made numerous findings on the accuracy of source system data. JTAV, however, is told by the data providers which systems are the systems of record and is reliant on the data provider for the accuracy of the data.

Reduce cost and improve efficiency.

- ◆ JTAV, at its simplest, provides a user access, through a single application, to data contained in over 100 logistics systems. This reduces costs by providing the data from these systems while reducing the training requirement necessary if individual users had to gain access to each system.
- ◆ The GAO notes that the TAV initiative (including JTAV) can be an important enabler for reducing DOD inventory requirements.⁴⁵
- ◆ JTAV has already been used in Kosovo and Bosnia, where logistics problems are hardly mentioned in after action reports, as opposed to the many problems reported during Desert Shield and before JTAV and the other TAV initiatives were deployed. The GAO reported that the Army Assistant Deputy Chief of Staff for Logistics estimated that better asset visibility would have saved DOD \$2 billion during Desert Storm⁴⁶.

Support garrison, deployed, and non-deploying organizations,

- ◆ JTAV supports all of these organizations. Limited visibility of Guard and Reserve components and most wholesale assets reduces JTAV's viability for some organizations.

Place no additional burden on operating forces.

- ◆ JTAV has been fielded and is supported by the JTAV Office. The on-site support staffs are contracted and provided by the JTAV Office.
- ◆ JTAV is easy to learn and use, and reduces, rather than adds, the burden of data gathering for DoD logisticians.

⁴⁵ GAO Report NSIAD/AIMD-98-122, Defense Management: Challenges Facing DOD in Implementing Defense Reform Initiatives, Mar 98, p.12.

⁴⁶ GAO Report NSIAD-99-40, Defense Inventory: DOD Could Improve Total Asset Visibility Initiative With Results Act Framework, Apr 99, p.1.

Appendix C: Intangible Benefits: Stories From the Field

The following are excerpts of good news stories from various CINC JTAV users. Dates of these stories are either omitted or were not captured originally.

1. Last week we got a reject through Standard Base Supply System (SBSS) concerning a requisition headed down to Istres but Istres had no record. By using JTAV with the NSN only, we discovered another contingency site had just decided to ship the property without notifying anyone.

Result: Istres canceled a due in valued at over \$13,000 since the property was already on the way. The depot was then able to redirect the shipment to another base with a critical need.

2. Using the Requisition Status query, we confirmed 43 shipments by the depot over 150 days ago. This met the criteria to cancel the requisitions that never arrived at the destination and reprocess the due-ins.

Result: Contingency sites received high priority, critical assets because of the confirmation by JTAV and reprocessing through SBSS.

3. An organization had ordered modular furniture. They ordered it on a high priority and wanted it to be shipped by air. I told them that I could monitor the status of the furniture if they could provide me a TCN that they did. Initially I could not locate the TCNs in JTAV but when I did I found that the furniture had been loaded in a Sea Land container for shipping by boat. I passed this information up the channel. OIC at the time took that information and contacted the appropriate people back in the States. The property was taken out of the container and redirected to an air shipment. The property arrived within a few days at Kimpo Airport to be delivered to the appropriate office for installation. Had this furniture been shipped by boat it would have taken well over 30 days for final delivery.

4. I can think of one instance where the AF found a HUMMV part in JTAV that belonged to the 5th Sig. Cmd (Army). They were able to get the part after funding issues were worked out. MSgt Keitt also found supply items the AF was ordering from downrange 100 meters away from their site with the Army supply activity in Tuzla. This saved considerable expense.

5. Believe this is a GREAT example of the goodness of RF Tags. By having the visibility of what is on the 39 pallets currently located at Ramstein, LTC Palmer, G-4 TF Eagle located at Tuzla, was able to determine which pallets had readiness drivers and direct their expedited shipment. Hard to believe there could still be non-believers in the value of RF Tags and in-transit visibility all within one system.

6. So far the new Trans (ITV) information is great! The attached file shows a query output for consignee FB5830, Tuzla. I was able to find a PRJ code 9ET, heading to Tuzla. With a little research I found it should be going to FB5857, Soto Cano, Honduras. The item is still @ DOV so the AF CSS MICAP folks are working to get it headed in the right direction.

7. I used JTAV to get a snapshot of the requisition history for an Antenna for the COMM Airfield radar at Taszar. I used this info to let the COMM staff know the problem may be more than just replacing the part, it maybe time to change out the whole radar systems. This output shows this part has been replaced 4 times in less than a year.

8. MSgt Keitt also found tents in JTAV for humanitarian aid in an Africa contingency.

9. We found out the other day that JTAV really does work. We were NIS on military working dogs food. This was a special diet food. Luciano found it available in JTAV. Through a bit of luck he was even able to find the food at an Air Force base in Turkey and was successful in obtaining the food.

10. Early this year we had a requirement to track eighteen (18) selected items of class VII equipment to determine if their respective readiness rate(s) was proportional or tied directly to the lack of in-theater class 9 repair parts. The only other alternative would be due to the lack of repair parts at the wholesale level.

A NSN feed was provided via SAMS 2, and the 026 Report. This report basically shows class 9 repair parts on order for the theater against the eighteen systems being tracked. We needed a way to batch the NSN's, because inputting them one at a time would have been too time consuming. JTAV is the one system available where you can batch NSN's 50 or more at a time, dependent primarily on server traffic.

With some 200 plus NSN's to input each tracking cycle (monthly) the process proved to be quick and efficient. Output from JTAV was then saved in excel format, then transferred to a master excel spreadsheet and sorted to our needs. This study went on for several months. We determined that the repair parts problem was not unique to either in-theater parts availability, nor could you attribute it directly to wholesale. Because of this analysis, we did not have to expend additional manpower or external assets and time for this project.

Bottom line analysis; JTAV proved it's value as a tool in determining our final analysis of class 9 Theater Vs Wholesale repair parts availability. As an action officer, I also use JTAV frequently to track requisitions. The new enhanced transportation screen report is a good time saver, as it's quick and the information provided is just what we need.

11. US Virgin Islands (Jun/Jul 1996 -I think): XVIII Airborne Corps troops deployed to the USVI for humanitarian purposes in the aftermath of Hurricane Marilyn. JTAV was the only logistics automation system available to these troops since they were unable to connect to the Standard Army Retail Supply System (SARSS) server at Fort Bragg NC. The deployed troops used JTAV and they also were in constant contact with the then existing JTAV Support Office at Bragg. The troops and the office were able to use JTAV to answer a myriad of mission essential data at the time.

12. Operation Desert Thunder I (Jan/Feb 98): HQ USCENTCOM action officers and the forces deployed to the CENTCOM AOR made use of JTAV to provide in-transit and asset visibility. MG

Solomon made favorable comments concerning JTAV support to a logistics group he addressed in Sarasota just prior to the 1998 JTAV Users Conference.

13. Summer & Autumn 1998/Spring 1999/Autumn 1999: HQ USCENTCOM and USCENTCOM component action officers are using JTAV (as the principal data source to DLA's Integrated Consumable Item Support (ICIS) system in the on-going routine planning cycle.

14. I find JTAV useful and it helps me to get information that is not otherwise directly available or in a consolidated format. For example, I received an e-mail recently with requisitions that were cancelled which I would then have to fill locally. I found two of the DODAACs were USAREUR units, but I couldn't get any response on the other DODAACs (typical computer response: no record, which doesn't say if it doesn't exist or if it is just not in the database). But using, JTAV I was immediately able to identify the unit and that it was not an USAREUR unit, so I didn't have to worry any further about it.

I also used the facility recently to obtain information on open requisitions. US Army Reserve wanted to buy some of my items and gave me a ship to address but no document numbers. Using JTAV, I was able to determine if there were any open requisitions for that unit that I could fill.

The same kind of thing was useful when I was shipping a piece to Bahrain for a unit out of California! JTAV helps to provide information about non-army units that I would not otherwise have access to using the Army systems on my computer and in a manner that is easy to learn and to use.

Appendix D: Summary of Government Accounting Office (GAO) Comments

GAO/ OCG- 99-4	Jan-99	Major Management Challenges and Program Risks: Department of Defense	<p>p.7. DoD continues to struggle to overcome the many problems brought on by decades of neglect and to fully institute sound financial management practices.</p> <p>p.7. Information management and technology issues are key DoD management challenges.</p> <p>p.9. DoD's inventory management practices continue to be ineffective and inefficient and are not well suited to meet DoD's new missions and warfighting strategies.</p> <p>p.14-15. DoD has not properly accounted for and reported billions of dollars of property, equipment, inventory, and supplies.... For example, recorded information on the number and location of several military equipment items, such as F-4 engines and service craft, was not reliable, on-hand quantities of inventories differed by 23 percent from inventory records at selected major storage locations, and over \$9 billion in know military operating materials and supplies were not reported. These weaknesses impair DoD's ability to (1) know the location and condition of all its assets, including those used for deployment; (2) safeguard assets from physical deterioration, theft, or loss; (3) prevent the purchase of assets already on hand; and (4) determine the full costs of the programs that use these assets.</p> <p>p.27. Effective information technology project planning and oversight are especially important as DoD moves to coordinate its thousands of decentralized command, control, communications, intelligence, surveillance, and reconnaissance systems in order to ensure information superiority over our nation's enemies.</p> <p>p.29. One of the most fundamental issues, which we reported on in August 1998, is that DoD has not completed development of an architecture, or blueprint, for its command, control, and communications systems.</p> <p>p.53. DoD was to completely implement asset visibility plans by 1996, later changed that date to 2001, and now will not completely implement its current plan until 2004.</p>
GAO/ NSIAD- 95-142	Aug-95	Inventory Management: DoD Can Build on Progress in Using Best Practices to Achieve Substantial Savings	<p>p.5. DLA's prime vendor programs for personnel items provide a basis for inventory reductions and costs savings, but DoD has not optimized these programs by adopting the most aggressive practices being used in industry.</p>
GAO/ T- NSIAD- 99-83	Feb-99	Defense Inventory: Continuing Challenges in Managing Inventories and Avoiding Adverse Operational Effects	<p>p.1. DoD continues to maintain large inventories that may be as much as 60 percent in excess of current needs.</p> <p>p.1. DoD spends approximately \$13 billion each year on new inventory items.</p> <p>p.1. We found that as of September 30, 1997, DoD did not need about \$1.5 billion, or 18 %, of the inventory it had ordered to meet current requirements.</p> <p>p.1. In our review of Air Force supply management, we found that shortages in aircraft spare parts caused degradation in mission capable rates for key aircraft, including the B1B, C5 and F16. Shortages of spare parts occurred because of inaccurate forecasting of inventory requirements, and other management weaknesses.</p> <p>p.2. ...DoD gave renewed emphasis to this Total Asset Visibility program for tracking equipment, supplies, and spare parts as well as requisitions on a continuous basis. However, DoD does not expect to fully implement this program until 2004. Program implementation problems have resulted largely from long-standing management issues that have hindered other major management initiatives. These issues include cultural</p>

			<p>resistance to change, service parochialism, and the lack of outcome-oriented goals, performance measures, and management accountability.</p> <p>p.3. We encourage DoD to take more aggressive actions to correct systemic problems so that its inventory management problems will not continue well into the next century. And, corrective action must be built on the strong underpinnings of management information systems capable of providing reliable and timely information needed for management decision making,</p> <p>p.5. Key aircraft that were not mission capable due to supply problems increased from an average of 6.4 percent in fiscal year 1990 to 13.9 percent in fiscal year 1998, for some types of aircraft, the averages were much higher.</p> <p>p.9. The continuing lack of adequate visibility over operating materials and supplies substantially increases the risk that million of dollars will be spent unnecessarily to acquire more items than would be needed if a clearer, more accurate picture existed of items in inventory, in-transit, and in theater, and asset managers had the ability to access and transfer those items.</p> <p>p.9-10. DoD's Performance Plan for Fiscal Year 2000, developed in response to the Government Performance Results Act, defines asset visibility as the percentage of DoD worldwide inventory in storage that is both visible and accessible to Integrated Material Managers (IMMs).... The plan notes that 94 percent of DoD's worldwide inventory is to be visible to military services or Defense agency tracking systems but only 80 percent is accessible by the appropriate IMMs who have wholesale management responsibilities for specific assets or classes of assets. The plan attributes the lack of visibility to data system interoperability problems. It states that the Department's strategy for fiscal year 2000 is to enhance the interface among the services and Defense agencies to achieve a TAV level of 90 percent. It notes that a potential complication in executing the strategy is the fact that TAV initiatives must compete with Year 2000 (Y2K) requirements for scarce information technology resources....</p> <p>p. 10. Our recent work found that while some component and theater specific asset tracking capabilities are reported to be operating; DoD-wide information on the progress in achieving TAV program goals is minimal.</p> <p>p.10. Along with an unclear picture of the program's status, planning for TAV has been inadequate at the strategic and implementation levels. DoD does not have a department wide TAV strategic plan to show how the various TAV initiatives underway within the individual DOD components contribute to the DoD's goals for the program.</p> <p>p.11. Over time, we believe that the Results Act, with its strategic planning and reporting requirements, and the Clinger/Cohen Act, which emphasizes performance based approach to information technology investments, could enhance DoD's efforts to provide an effective framework for addressing TAV implementation challenges and achieving its program goals.</p>
GAO/T-NSIAD-97-109	Mar-97	Defense Inventory Management: Problems, Progress, and Additional Actions Needed	<p>p.1. We have identified defense inventory management as 1 of our 25 high-risk areas in the federal government because of vulnerabilities to waste, fraud, and abuse.</p> <p>p.3. In the short term, DoD must continue to emphasize the efficient operation of its existing logistics systems. This includes reducing and disposing of unneeded inventory, implementing efficient and effective inventory management practices, training personnel in these practices and rewarding the right behavior, improving requirements data accuracy and enforcing existing policies and procedures to minimize the acquisition and accumulation of unnecessary inventory</p> <p>p.7. The amount of time required by the logistics system is important because DoD must invest in enough inventory to resupply units with serviceable parts during the</p>

			<p>time it takes to move and repair broken parts.</p> <p>p.14. In 1996, we examined 24 different types of Army aviation parts, and calculated that the Army's logistics system took an average of 525 days to ship broken parts from field units to the depot, repair them, and ship the repaired parts to using units.</p> <p>p.15. We estimated that it could take [the Navy], on average, about 4 months from the time a broken part is removed from an aircraft to the time it is ready for reissue.</p> <p>p.15. One [Air Force] part we examined had an estimated repair cycle time of 117 days; it took British Airways only 12 days to repair a similar part.</p>
GAO/HR-95-5	Feb-95	Defense Inventory Management:	<p>p.21. With these inventory record accuracy weaknesses DoD cannot ensure that it can meet readiness demands. This readiness impact, as it pertained to Operation Desert Shield/Storm, was highlighted in DoD's fiscal year 1993 Federal Managers Financial Integrity Act report. That report stated that "significant deficiencies in tracking inventory and maintaining inventory records...made operational support planning more difficult and were responsible for duplicate orders, backlogs at aerial and sea ports, unnecessary material shipped into theater, difficulty in prioritizing cargo backlogs, and inefficient intra-theater movement.</p>
GAO/NSIAD-97-28	Dec-96	Logistics Planning: Opportunities for Enhancing DoD's Logistics Strategic Plan	<p>p.3. DoD's vision is guided by several principles, which its plan highlights, such as the</p> <ul style="list-style-type: none"> ◆ Need for near real-time information on material and logistics support capabilities ◆ Need for both performance metric and performance measurement methods ◆ Use of process reengineering and investment to reduce the operational and support cost burden on defense resources without reducing readiness. <p>p.3. The plan recognizes that the future logistics environment will require ...visibility of key assets.</p> <p>p.3. In all, the plan lists 95 specific strategies, plus 12 priority strategies, such as total asset visibility.</p> <p>p.4. DoD recognized, however, that implementing certain strategies was often more complex than originally anticipated and that while most strategies included specific milestones, many actions do not happen just once but continue.</p> <p>p.5. We [GAO] did note that DLA is the only major defense agency to take the initiative to ensure that the goals and strategies of its corporate plan (similar to a strategic plan) link directly to DoD's plan.</p> <p>p.6. There are several interrelated strategies in DoD's plan that depends on CIM for success, such as the joint battlefield distribution, the joint total asset visibility, and the in-transit visibility strategies.</p> <p>p.6. Similarly, the joint total visibility strategy is ultimately dependant on CIM migration systems to help it provide timely, accurate information on the location and movement of personnel, equipment, and supplies...Therefore, until CIM migration systems are fully implemented, these dependent strategies may experience considerable difficulty achieving their goals and objectives.</p>
GAO/AIMD-96-109	Sep-96	Defense IRM: Critical Risks Facing New Materiel Management Strategy	<p>p.1. During the course of our review, however, Defense decided to undertake a different approach to developing material management systems because of funding cuts, costs overruns and schedule delays. Also, individual services were pressing for quicker systems deployment. Under the new approach, the material management systems will not be standard or integrated. Instead, each of the nine system applications will be individually and incrementally developed and deployed at selected</p>

		<p>inventory control points between fiscal years 1996 and 1999. The military services and Defense Logistics Agency (DLA) will choose which applications they want, and some inventory control points may never receive new systems. Deployment will be constrained by available funding. This is a major departure from DoD's previous goal of eliminating multiple and redundant business processes and hundreds of legacy (current) systems and moving to a standard corporate logistics process and system.</p> <p>p.5. Currently, Defense relies on over a reported 500 legacy systems to carry out wholesale logistics operations. As these systems become fragmented, outdated, and inefficient, they require billions of dollars in maintenance costs. According to Defense, because today's material managers do not have access to timely, accurate, and reliable logistics information, they increasingly make unnecessary requisitions, which, in turn, result in excess inventory and waste.</p> <p>p.6. By embarking in 1992 on a strategy to develop the material management standard system (MMSS), Defense sought to replace hundreds of service-unique legacy systems being used to acquire, manage, move, and maintain inventory items with nine standard systems...Generally, these systems are intended to improve business operations in the following ways:</p> <ul style="list-style-type: none">◆ Asset Management- provides greater asset visibility from the time of purchase to use and the capability to track and monitor product quality using automated deficiency reports during the wholesale process.◆ Requirements Determination◆ Supply and Technical Data <p>p.7. From 1992 to 1995, Defense spent about \$714 million developing standard systems, with minimal results.</p> <p>p.14-15. According to program officials, Defense is considering implementing a "data focused approach" to material mgmt systems starting in FY 98 that would enhance interoperability and logistics modernization efforts through the use of "middleware" software. Middleware permits an application to see the data stored in other applications as if the data was a single, logical data repository. In doing so, it precludes the need to radically redesign the legacy systems and implement data standardization. If pursued, the middleware alternative could extend deployment schedules and drive up maintenance costs for existing systems. It also will not result in the consolidation or elimination of legacy systems.</p> <p>p.18. Because of continuous problems in defining requirements and schedule slippage, Joint Logistics Systems Center stopped all development work on Stock Control System in December 1995. At the time, SCS development was about 55% complete; JLSC still plans to deploy SCS; however, it will limit additional functional enhancements and will deploy the system only to the Marine Corps and the Air Force.</p> <p>p.20. Under ITMRA, DoD is required to design and implement a process for selecting information technology investments using criteria such as risk-adjusted ROI and specific criteria for comparing and prioritizing alternative information system projects.</p> <p>p.28. The Department is addressing the concerns expressed by the draft GAO report in a new logistics business systems strategy that is currently being written. The focus of the new strategy is the creation of a common operating environment for logistics within the Defense Information Systems Agency (DISA) Global Combat Support System (GCSS) structure.</p> <p>p.30. The core of the strategy will be the establishment of a common technical/functional architecture within which logistics business applications will operate. The architecture will be founded on DISA prescribed guidelines and tools and upon a jointly developed data strategy that is currently being defined as a sub-element of the [Logistics Business Systems] strategy.</p> <p>P.40-41. Most of the users have experienced problems in accessing SCS, which has</p>
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			<p>been unavailable for periods of time ranging from a few minutes to several days. Given that users spend up to 90% of their day on SCS, this problem could inhibit their ability to do their jobs.</p>
GAO/T-NSIAD/AIMD-98-122	Mar-98	Defense Management: Challenges Facing DoD in Implementing Defense Reform Initiatives	<p>p.4. "Accordingly, the Secretary [of Defense] called for what has been characterized as a revolution in business affairs and included in the DRI report a number of reengineering initiatives aimed at adopting modern business practices and attempting to achieve world-class standards of performance. These initiatives include DOD's efforts to develop a total asset visibility capability so that it can better manage its inventory"</p> <p>p.12. We have also noted that the TAV implementation date has slipped considerably, from 1995 to...2004.</p> <p>p.11-12. TAV will depend on several large, complex IT initiatives (such as Joint TAV, Army TAV, Navy TAV, the Global Transportation Network, and automated identification technology) and component logistics information systems. The TAV initiative can be an important enabler for reducing DoD inventory requirements.</p> <p>P.12. Although total costs have not been finalized, we have been able to identify funding needs exceeding \$600 million for TAV and its supporting initiatives.</p>
GAO/NSIAD-98-47	Jan-98	Defense Inventory Management: Expanding the Use of Best Practices for Hardware Items Can Reduce Logistics Costs	<p>p.10. According to DLA records, with the direct vendor delivery program, in 1996 it took an average of 54 days for customers to receive ordered items, or twice as long as the 25-day delivery average for items stocked in DLA warehouses.</p>
GAO/HR-97-5	Feb-97	Defense Inventory Management	<p>p.6. In September 1995, DOD reported that it had a secondary item inventory valued at \$69.6 billion. Based on DoD data, we estimate that about half of the inventory includes items that are not needed to be on hand to support DoD ware reserve or current operating requirements.</p> <p>p.9. In the long term, DoD must establish goals, objectives, and milestones for changing its culture and adopting new management tools and practices. These solutions include providing managers with the tools, critical to managing inventory efficiently, that it had planned to provide through the DBOF and CIM initiatives.</p> <p>p.15-16. In 1995, we reported that DoDs 1994 strategic plans for logistics called for improving asset visibility in such areas as in-transit assets, retail level stocks, and automated systems. The asset visibility plans were to be completely implemented by 1996. According to Do current plan, the total asset visibility initiative will not be completely implemented until 2001.</p> <p>p.16. The lack of adequate visibility over operating materials and supplies substantially increases the risk that millions of dollars will be spent unnecessarily.</p> <p>p.16. We [GAO] estimated that because of the lack of oversight in the first half of 1995, item managers ordered or purchased items in excess of operating level needs and that, as a result, the Navy will incur unnecessary costs of about \$27 million.</p> <p>p.18. In a September 1996 report on the fiscal year 1997 DoD budget, we identified potential reductions of \$723 million in the inventory management area. These reductions were based on (1) reclaiming spare parts from excess aircraft, (2) considering parts on hand at the depot maintenance facilities as an offset to spare and repair parts requirements, (3) eliminating duplicated depot maintenance requirements (4) reducing requirements that were overstated due to inaccurate lead times, demand rates, and due out quantities; and (5) correcting inaccurate budget data.</p>
GAO/NSIAC-	Feb-97	Defense Logistics: Much of the Inventory	<p>p.3. Army, Navy, and Air Force records indicated that unneeded inventory items valued at \$28.4 million had 20 years or more of inventory on hand and another \$11.3</p>

97-71		Exceeds Current Needs	<p>million of inventory on order. However, because the records for almost 40 percent of the reviewed items were in error (generally on-order quantities had been delivered but not recorded) these items, in fact, did not have additional stock on order.</p> <p>p.4. No projected demands existed for 1.5 million of the 1.9 million items with unneeded inventory. The 1.5 million items had unneeded inventory valued at \$14.6 billion.</p> <p>p.9. Our definition of needed inventory represents inventory that is required to prevent out of stock situations.</p> <p>p.27. While the Department does not intentionally order “unneeded” inventory (as defined by the GAO), much of the inventory, once bought, will be needed in the future beyond the budget year.</p>
GAO/T-NSIAD/AIMD-97-143	May-97	DoD High-Risk Areas: Eliminating Underlying Causes Will Avoid Billions of Dollars in Waste.	<p>p.3. “...The task of eliminating the high risk areas altogether remains to be accomplished. Key to accomplishing this task is attacking the following underlying causes of the high risk areas:</p> <ul style="list-style-type: none"> ◆ Cultural barriers and parochialism limit opportunities for change ◆ Incentives for seeking and implementing change are lacking ◆ Management data are deficient. For example, better info on the quantity and location of items in the DoD inventory would prevent DoD managers from procuring additional items at one location that are already on hand at another location. ◆ Clear and results oriented performance measures are lacking ◆ Management accountability and follow through have been inadequate. <p>p.11. In 1989, the Department started its Corporate Information Management (CIM) initiative to take better advantage of its information technology investments by streamlining operations and implementing standard information systems supporting such important business areas as supply distribution, material management, personnel finance, and transportation. The results have not been as anticipated by DoD. While DoD projected \$36 billion in savings, its failure over the past 8 years to implement sound business practices to control investment dollars and link systems modernization practices to business process improvement efforts has led to an outlay of over \$20 billion with no corresponding savings in return</p> <p>p.12. We have found that billions of dollars have been spent on these projects with little analytical justification.... For example, in material management, DoD abandoned its system modernization strategy after spending over \$700 million. In the transportation area, DoD made some investments that are likely to result in a negative return on investment.</p> <p>p.20. Our work shows the following:</p> <ul style="list-style-type: none"> ◆ Visibility over inventory is not adequate. The lack of visibility over operating materials and supplies substantially increases the risk that millions of dollars will be unnecessarily spent. ◆ Requirements are overstated: ◆ Financial accountability and internal controls are weak. The Secretary of Defense identified several financial and internal control weaknesses within DoD, such as (1) inventory systems that are not integrated or cannot respond rapidly to change (2) difficulties in reconciling physical inventories and valuating properties and equipment, and (3) lack of indicators that measure performance and cost. <p>p.22. DoD has acknowledged the necessity to change its inventory management culture but has been slow in taking steps to do so. For example, DoD has been slow to implement its plans for improving asset visibility in areas as in-transit assets, retail-level stocks, and automated systems.</p> <p>p.24. DoD decision-makers are severely affected by the lack of comprehensive and</p>

			<p>reliable data for measuring program costs and results making well-informed decisions. For example, better information on the quantity and location of items in its inventory would help prevent DoD managers from procuring additional items at one location that are already on hand at another location.</p>
GAO/T-AIMD/N SIAD-99-145	Apr-99	DoD Financial Management: More Reliable Information Key to Assuring Accountability and Managing Defense Operations More Efficiently	<p>p.3. These [logistics] systems are the primary source of information for (1) maintaining visibility over assets to meet military objectives and readiness goals and (2) financial reporting. However, these systems have material weaknesses that, in addition to hampering financial reporting, impair DoD's ability to (1) maintain central visibility over its assets, (2) safeguard assets from physical deterioration, theft or loss, and (3) prevent the purchase of assets already on hand.</p> <p>p.3. Overall, these weaknesses can seriously diminish the efficiency and economy of the military services' support operations. For example, DoD's lessons learned from Desert Storm highlighted combat support problems associated with tracking the status and location of personnel and supplies.</p> <p>p.3. In response to this problem...DoD renewed its TAV initiative to provide department-wide access to timely, accurate information on the status, location, and movement of units, personnel, equipment, and supplies, including weapon systems, secondary inventory, and ammunition.</p> <p>p.4. As discussed in the following sections, Information on these logistics systems on DoD weapon's systems and inventories does not meet the accuracy objectives and unless substantive improvements in producing reliable, timely data are made, it will be difficult for efforts such as GCSS and TAV to achieve their objectives.</p> <p>P.4. "...Many of the military services' logistics systems used to track and support weapon systems and support equipment were unable to be relied on to accurately provide information to support DoD's asset visibility and reporting.</p> <p>p.4. Specifically, auditors determined that the Navy systems relied on for visibility or accountability over active boats, service craft, and uninstalled engines failed because the data were either incomplete or included assets that no longer existed (2 of 45 boats in Combatant Craft and Boat Support System disposed of or sold, 21 of 79 boats listed in Naval Vessel Register either could not be found or were disposed of, 10 of 105 uninstalled engines could not be found).</p> <p>p.5. For example, we have reported that CBS-X was inaccurate because it (1) does not effectively capture data on equipment transactions from all Army units, (2) reflects software errors, and (3) contains transaction posting errors.</p> <p>p.6. Incomplete and inaccurate data will hamper the department's ability to meet and sustain the goals of TAV and other DoD wide asset visibility initiatives. In addition, inaccurate and omitted data increase the risk that responsible inventory item management may request funds to obtain additional, unnecessary inventories that are on hand but not reported.</p> <p>p.6. DoD's 1999 Annual Report to the President and the Congress incorporated the TAV initiative goals, including the target of 90% visibility of material assets by 2000. TAV's longer-term target is 100% visibility by 2004. The overall objective of TAV is to use the information to improve DoD logistics practices, including sharing assets within component commands and/or among components. DoD cannot attain its overall TAV objective without both complete and accurate data.</p> <p>p.7. With regard to accurate inventory data, financial audits have repeatedly found large differences between on hand and recorded inventory quantities. For example, In 1996 the DoD IG reported an overall 24% error rate in DoD's primary storage locations. In 1997, Navy auditors reported a 23% error rate for the 13 major storage locations visited. Finally, in 1998, for the 14 depots we visited holding 82 percent of depot inventory, accuracy rates were below DLA's targeted 95 percent accuracy</p>

			<p>mark, with only 2 depots reporting inventory accuracy rates above 90 percent.</p> <p>p.7-8. In February 1997, we reported that DoD had ordered \$11.3 million in items... that were already in excess supply. In addition, we estimated that the services could save about \$382 million annually in inventory holding costs by eliminating at nonmajor locations inventory that is not needed to meet current requirements.</p> <p>P.11-12. DoD is unable to develop reliable, cost-based performance indicators and measures across virtually the entire spectrum of its operations. As part of its Results Act Performance Plan for fiscal year 2000, DoD developed 43 unclassified performance measures and indicators to measure a wide range of activities, from force levels to asset visibility, but these measures and indicators contain few efficiency measures based on cost.</p> <p>p.15. The department acknowledged, and audit reports have confirmed, that data produced by many of these feeder systems are not yet reliable.</p>
GAO/NSIAD-95-64	May-95	Defense Inventory: Opportunities to Reduce Warehouse Space	<p>p.3. We analyzed DoD secondary inventory that had an estimated volume of 218.8 million cubic feet. Secondary inventory items accounting for 130.4 million cubic feet, or 60 percent of the 218.8 million cubic feet, are not needed to satisfy current war reserve and operating requirements.</p> <p>p.3-4. Beginning in FY 96, DLA will charge inventory managers responsible for making storage decisions \$5.15 per square foot for covered space their items occupy.</p> <p>p.4. Our analysis of DoD's September 30, 1993 Supply System Inventory Report and inventory stratification reports indicates that \$36.3 billion of the \$77.5 billion secondary inventory that DoD reported exceeded current war reserve and operating requirements. (The \$77.5 billion and the \$36.3 billion includes inventory that has been revalued to reflect the value of items that need to be repaired and the scrap value of items to be disposed of. We estimate that if all the inventory were valued at its acquisition cost, the values would be \$96.8 billion and \$48.4 billion respectively)</p> <p>p.5. DLA estimates that the holding costs for the 130 million cubic feet are approximately \$94 million per year, which is less than 1 percent of the inventory value. This is low when compared to industry experience, which according to one study, ranges from 5 to 15 percent.</p> <p>p.16. The service unit (customer) that requests and uses the inventory pays for the cost of storage because cost is included in the price charged the customer.</p> <p>p.24. In fact, overall, the DoD disposal costs historically have exceeded the revenue that disposal of the stocks generate, or in other words, it costs the department to dispose of inventory.</p> <p>p.26. DoD experience indicates that a large number of items not used one-year will be used the next. For example, a third of all DLA items that had no demand last year will be ordered this year. Even after five years with no demand, one item in eight will still be ordered.</p>
GAO/NSIAD-97-47	Jan-97	Defense Inventory: Spare and Repair Parts Inventory Costs Can Be Reduced	<p>p.1. The Army, Navy, and Air Force have about 632,000 items of spare and repair parts, valued at 83.5 billion.</p> <p>P.1. The storage cost ranges from \$0.48 to \$5.15 per square foot depending on whether it is open or covered storage.</p> <p>P.1-2. Most of the services' inventory items stored at nonmajor locations is in small quantities. In fact, over 53 percent of the items were in quantities of 3 or less, while only 25 percent were in quantities of 11 or more.</p> <p>p.2. Based on our analysis, we [GAO] estimate the services could save about \$382 million annually in inventory holding costs by eliminating inventory at nonmajor</p>

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			<p>locations that is not needed to meet current operating or war reserve requirements.</p> <p>p.6. The DLA Defense Distribution Region West's analysis of 3,130 dormant line items of inventory at its storage facilities showed that by eliminating the dormant line items, over 126,000 square feet of storage space could be freed up and the services could save an estimated \$989,000 in storage costs, an average savings of about \$316 per item line item.</p> <p>p.6. The following examples illustrate the inefficiencies of storing small quantities of items, many of which are unneeded, at multiple storage locations.... One \$2.96 nonmetallic bumper...was the only item in a standard, small storage bin. The bin, which occupies 1.83 square feet, can hold 259 nonmetallic bumpers. Based on the least expensive form of covered storage of \$5.15 per square foot, it costs the Army \$9.42 a year to store the \$2.96 item.</p> <p>p.7. DLA officials said that from a cost-effectiveness and supply responsiveness standpoint, it is not necessary to store items at multiple locations... However, under the services' current inventory stocking policies, the services direct where items are stored.</p>
GAO/NSIAD-00-21	Oct-99	Defense Inventory: Management of Repair Parts Common to More Than One Military Service Can be Improved	<p>p.4. DoD IG reported that primary inventory manager did not have information on \$400 million in assets held by other services and that over \$140 million of these assets could have been used to fill the needs of the primary manager.</p> <p>p.5-6. The number of identical parts used by more than one service has not changed significantly since Oct 95, remaining steady at about 11 percent of total repairables. [Roughly 60,000 items]. DoD records indicate that these identical parts are valued at a latest acquisition cost of almost \$4 billion.</p> <p>p. 9. We [GAO] analyzed June 1998 Defense Logistics Information Service cataloging data on identical parts...and found that the secondary managers had parts on hand that should have been in the hands of the primary managers as prescribed by DoD regulations. These assets were valued at nearly \$474 million for 7,683 parts. For over 1000 of these parts, the primary manager had no assets to meet current needs while the secondary managers had assets on hand valued at nearly \$47 million.</p> <p>p.10. Parts in the hands of secondary managers create the potential for unnecessary procurements because primary managers may not be aware of these assets. Several item managers, in their role as a primary manager, told us that they did not have information on the amount of inventory held by secondary managers.</p> <p>p. 10. The DoD IG issued four reports over the 13-year period ending 1995 that discussed problems and issues in the area of identical parts.... The 1995 report noted that primary managers did not have information on over \$400 million in assets held by secondary managers. Over \$140 million of these assets could have been used to fill primary manager inventory needs. In addition, the report discussed unnecessary procurements, required inventory being disposed of, and excess inventory not being disposed of. Similar points were made in a 1992 DoD IG report. A recent DoD IG audit report, issued in May 1999 dealt with the disposal of identical parts. A main finding of that review was that secondary managers were disposing of assets without notifying the primary manager. As a result, the primary manager was purchasing parts at the same time the disposal actions were occurring.</p>
GAO/NSIAD-99-40	Apr-99	Defense Inventory: DoD Could Improve Total Asset Visibility Initiative With Results Act Framework	<p>p.1. During Operations Desert Shield and Desert Storm...according to the Army Assistant Deputy Chief of Staff for Logistics better asset tracking could have saved \$2 billion.</p> <p>p.3. TAV has been cited in several DoD planning documents as a critical initiative to improving logistics.</p> <p>p.4. While DoD has established some general measures for determining the status of TAV implementation, these do not account for critical elements needed to realize most</p>

			<p>TAV initiative goals.</p> <p>p.4-5. The [DoD TAV] plan did not identify specific ways to measure the progress being made or to determine the status of efforts to realize the overall TAV goals and the areas that need to be addressed.</p> <p>p.5. The areas not measured include tracking of requisitions, assets in process and in transit, and the improvement of logistics management within theaters of operation.</p> <p>p.5. DoD reports that inventory managers were able to track 94% of their secondary inventories in storage and had the capability to access 80% of those assets. However, these measures not only exclude those inventories in process or in transit (states goals of the TAV initiative), but also do account for critical initiative elements such as the timeliness or accuracy of the data.</p> <p>p.5. Components defined their own baselines by selecting in-storage inventories for measuring progress toward TAV goals, and these in-storage inventories varied by component.</p> <p>p.5. DoD was unable to aggregate component results in measures that show progress toward meeting TAV initiative goals. For example, DoD officials recognized that providing inventory managers the capability to redistribute assets using the TAV system was more important than only tracking assets, and components had examples of how they had redistributed some assets using TAV. However, there were no measures of how the TAV system was being used to support asset redistribution, and components lacked such measures. Agency officials stated that each component has the capability to redistribute assets within its own component and that the components were working jointly to use TAV to move toward redistributing assets across components.</p> <p>p. 6. In 1972, DoD set a goal to improve visibility over its inventories by 1980, but did not achieve that goal. Later, during the Persian Gulf War, DoD problems with inventory management were highlighted when thousands of duplicate orders were placed because operational units had inadequate visibility over the status of their requisitions and large amounts of material shipped to the theater were unavailable to U.S. forces because the location of the material was unknown.</p> <p>p.7. The TAV plan does not set forth how the system will be used by the components in the day-to-day work processes, financial reporting, and the sharing of assets among commands and components.</p> <p>p.7. Personnel at the March 1998 TAV users' conference stated that DoD needs to develop user requirements, clarify those requirements, and tie those requirements to the data that is being requested from the components.</p> <p>p.7. The plan also does not set forth how TAV systems will integrate with and/or support other management information systems, such as financial management systems and reporting. Accurate reporting of inventory assets has been a longstanding problem for DoD, and data from TAV systems could be used to support reporting systems in the Department. DoD will overlook an opportunity to address financial reporting requirements if it implements a TAV system without addressing financial reporting requirements.</p> <p>p.8. Further, the plan does not set forth how TAV systems would be used to support the sharing of assets within component commands and/or among components, even though asset sharing is an overall goal of the initiative.</p> <p>p.8. Funding for the TAV initiative is contained in the components' and the Joint TAV Office's budgets. However, there is no estimate of the total resources expended thus far on future funding requirements.</p>
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		<p>p. 8. According to agency officials, the components were giving important TAV-related work (such as maintenance on systems that support TAV) lower priorities than other competing initiatives within the components.</p> <p>p.8-9. DoD managers lacked the information to understand how these priority decisions would ultimately affect TAV implementation. According to one component official, unless funds are provided specifically to support each component's part of the TAV initiative, the department-wide TAV effort may fail because the components are giving funding priority to their own initiatives.</p> <p>p.9. We [GAO] believe that that plan should indicate how DoD would address the problems that can affect the success of the initiative.</p> <p>p.9. Data quality problems remain unresolved in TAV supporting systems.</p> <p>p.9. Improving data quality is particularly important to TAV initiative users because they will be relying on this data to redistribute assets from one location to another. Department wide and component TAV initiatives were to be supplied data from many component logistics systems from worldwide DoD locations.</p> <p>p.9. Security is another major issue for TAV users and data providers.</p> <p>p.10. The TAV system uses approaches that have known vulnerabilities, such as Internet based applications.</p> <p>p.10. The TAV system will access information from over 100 component logistics systems, which are built on many other lower level systems. If a number of these systems were disabled... the scope of information available in the TAV system could be dramatically affected.</p> <p>p.12. As we noted in a prior report describing attempts to make Department wide changes in asset management practices, cultural resistance to change and service parochialism have contributed to the difficulty of implementing corrective actions to improve DoD systems that are at risk. We pointed out that DoD believed it was better to overbuy items than to manage with the amount of stock needed. As a result of this attitude and other inventory management weaknesses, DoD has acquired and held too much inventory. This resistance, along with the reluctance to share assets across the components and a lack of an appropriate system infrastructure to support and track such transfers, is a major cause of DoD problems in realizing its department-wide TAV initiative goals.</p> <p>p.12. Initiative and component managers cited the lack of willingness to transfer assets across the Department as a major obstacle to improving inventory management practices. They noted that this problem has led to conflicts about the sharing of data and providing funding to ensure the quality data was supplied to the Department wide TAV initiative.</p> <p>P.14. Without clear, hierarchically linked goals and performance measures that are supported by the components, DoD cannot adequately motivate components to better work together to meet Department wide TAV goals. We found, for example, that components were developing and implementing their own TAV capabilities, but they believed that they owned the assets, and they would remain reluctant to transfer assets to other components unless DoD transferred ownership to a central DoD authority.</p> <p>p.15. We recommend that the Secretary of Defense direct that actions be taken to develop a Department wide TAV strategic plan and associated component implementation plans based on the outcome-oriented management principles embodied in the Results Act and the Clinger-Cohen Act; such plans must be agreed to and supported by relevant components. Specifically, all plans should:</p>
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			<ul style="list-style-type: none"> ◆ Describe a complete management structure and officials, including component officials that will be accountable for ensuring the timely success of the TAV initiative. ◆ Identify complete resource requirements for implementing the TAV initiative and include related investment analyses to show how the major information technology investments will support TAV initiative goals. ◆ Describe how the initiative will be incorporated into DoD work processes in support of DoD's TAV performance goals and how appropriate training will be put in place to support the new work processes and the related cultural change that must be made to support Department wide asset sharing. ◆ Identify how Department wide systems issues that affect implementation of TAV will be addressed ◆ Establish outcome oriented TAV initiative goals and performance measures for all relevant components and closely link the measures to improvement targets established in documents such as DoD's Logistics Strategic Plan and the Results Act Performance Plan in the Annual Report tot he President and the Congress
GAO/N SIAD- 96-183	July 1996	Defense Budget: Trends in Active Military Personnel Compensation Accounts for 90-97	p.2. About 85 percent of the military personnel accounts in fiscal year 1997 consist of five pay categories: basic pay (51 percent); retired pay accrual (17 percent); basic allowance for quarters (7 percent); subsistence (5 percent); and social security tax payments (4 percent).

Appendix E: Technical Appendix of Calculations and Formulas

The calculation of applicable Discount Factors for the five years covered by this study are shown below. This is based on the official rates prescribed under the Office of Management and Budget (OMB) Circular No. A-94 as revised on January 2000. This rate is valid until January 2001. Appendix C of OMB Circular A-94 is quoted below:

DISCOUNT RATES FOR COST-EFFECTIVENESS, LEASE PURCHASE, AND RELATED ANALYSES

Effective Dates. This appendix is updated annually around the time of the President's budget submission to Congress. This version of the appendix is valid through the end of January 2001. Copies of the updated appendix and the Circular can be obtained in an electronic form through the OMB home page, <http://www.whitehouse.gov/OMB/circulars/index.html>. Updates of this appendix are also available upon request from OMB's Office of Economic Policy (202-395-3381); also, a table of past years' rates are available from OMB.

Nominal Discount Rates. Nominal interest rates based on the economic assumptions from the budget are presented below. These nominal rates are to be used for discounting nominal flows, which are often encountered in lease-purchase analysis.

Nominal Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	30-Year
5.9	6.0	6.0	6.1	6.3

Real Discount Rates. Real interest rates based on the economic assumptions from the budget are presented below. These real rates are to be used for discounting real (constant-dollar) flows, as is often required in cost-effectiveness analysis.

Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

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3-Year	5-Year	7-Year	10-Year	30-Year
3.8	3.9	4.0	4.0	4.2

Analyses of programs with terms different from those presented above may use a linear interpolation. For example, a four-year project can be evaluated with a rate equal to the average of the three-year and five-year rates. Programs with durations longer than 30 years may use the 30-year interest rate.

¹ The methodology for calculating the discount factors associated with a given discount rates (.039 in this case) is based on the following formula:

$$PVF_n = 1/(1+d)^n$$

where PVF = the present value factor for year n
d = the discount rate
n = the project year

For example, the calculation of the end-of-year discount factors for the first three years is:

$$PVF_1 = 1/(1+.039)^1 = 0.962464$$
$$PVF_2 = 1/(1+.039)^2 = 0.926337$$
$$PVF_3 = 1/(1+.039)^3 = 0.891566$$

The preceding example has demonstrated the calculation of discount factors that represent end-of-year factors. When costs and benefits occur in a steady stream, applying mid-year factors would be more appropriate for the analysis. The formula for the calculation of the mid-year discount factors becomes:

$$PVF_n = 1/(1+d)^{(n-.5)}$$

For example, the calculation of the mid-year discount factors for the first three years of this five-year project is:

$$PVF_1 = 1/(1+.039)^{.5} = 0.981052$$
$$PVF_2 = 1/(1+.039)^{1.5} = 0.944228$$
$$PVF_3 = 1/(1+.039)^{2.5} = 0.908785$$

Treatment of Costs and Benefits

Each year's expenditures are assumed to be made at the beginning of the year. All annualized benefits are assumed to be realized at the middle of each year. Residual value of all potential capital assets as of the end of FY2005 is placed at zero (\$0.00) for purposes of this analysis. The main reason for this type of treatment is that the portion of the total investment that can be classified as "capital assets" is expected to be insignificant. Moreover, for assets that may have residual value (i.e., hardware and

software), liquidation (convertibility to cash, as in re-sale) at the end of FY2005 is considered not feasible.

Treatment of Inflation

Estimates for costs and benefits are expressed in Current Dollars. The effect of inflation is taken into account with the use of the Real Discounting Rate in the discounted cash flow analysis. Based on the prescribed Real and Nominal Discount Rates for the 5-year period covered by this study, the assumed constant annualized inflation rate is 2.1 %. This is the difference between the Nominal Discounting Rate of 6.0%, and the Real Discounting Rate of 3.9%.

Discounting

The Real Discounting Rate used in this study is 3.9% per year.

Discount Factors for Discount Rate of 3.9 Percent

Year Since Initiation	Year-end Discount Factor	Mid-Year Discount Factor	Beginning-of-Year Discount Factor
1	0.962464	0.981052	1.000000
2	0.926337	0.944228	0.962464
3	0.891566	0.908785	0.926337
4	0.8581	0.874673	0.891566
5	0.82589	0.841841	0.8581

Personnel Cost Calculations

NOTE* These costs have NOT been discounted to NPV.

The average military pay at the FY 2000 pay rates under our assumptions is \$53,468; this includes basic pay, housing and subsistence benefits. A 1996 GAO report analyzed military compensation and found that basic pay, basic allowance for quarters and subsistence allowances accounted for only 63% of the actual personnel cost to DoD. The remaining 37% included medical benefits, special pays and allowances, retirement accrual, and taxes.⁴⁷ Based on these figures, this report uses the average salary adjusted by factors of 25%, 37%, and 50% respectively as a basis for personnel costs. This range will also offset the differences in pay for JTAV users above or below the representative ranks selected. We also assume that compensation for contractor and/or DoD civilian personnel falls within these ranges.

⁴⁷ NSIAD-96-183, Trends in Active Military Personnel Compensation Accounts for 1990-1997, p.2.

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Military Annual Pay as of 7/1/2000
14 years of service

	O-4	E-7	Avg.
Basic Pay:	\$ 55,332	\$ 29,272	\$ 42,302
Housing w/dependents	\$ 10,224	\$ 7,434	\$ 8,829
Subsistence	\$ 1,906	\$ 2,767	\$ 2,336
TOTAL	\$ 67,462	\$39,473	\$ 53,468

Annual Pay with Benefit Cost Adjustment

Total Plus 25%	\$ 84,553	\$49,341	\$ 66,835
Total Plus 37%	\$ 92,423	\$54,078	\$ 73,251
Total Plus 50%	\$101,193	\$59,210	\$ 80,202

	Rank	O-4	E-7	Avg.			
Annual	Low (25%)	84,553	\$49,341	\$66,835			
Salaries	Avg (37%)	\$92,423	\$54,078	\$73,251			
	High (50%)	\$101,193	\$59,210	\$80,202			
	Hrs/yr worked	Hrs/mo saved	Months/yr				
	1920	15	12				
	Rank	O-4	E-7	Avg			
Hourly	Low (25%)	\$ 44.04	\$ 25.70	\$ 34.81			
Rates	Avg (37%)	\$ 48.14	\$ 28.17	\$ 38.15			
(Annual/1920)	High (50%)	\$ 52.70	\$ 30.84	\$ 41.77			
Monthly	Rank	O-4	E-7	Avg			
Savings	Low (25%)	\$ 660.57	\$ 385.48	\$ 522.15			
(Hr*15)	Avg (37%)	\$ 722.05	\$ 422.48	\$ 572.27			
	High (50%)	\$ 790.57	\$ 462.58	\$ 626.58			
	Rank	O-4	E-7	Avg			
Annual	Low (25%)	\$ 7,926.84	\$ 4,625.72	\$ 6,265.78			
Savings	Avg (37%)	\$ 8,664.66	\$ 5,069.81	\$ 6,867.28			
(Monthly Savings*12)	High (50%)	\$ 9,486.84	\$ 5,550.94	\$ 7,518.94			
	Growth rates	FY01	FY02	FY03	FY04	FY05	
	10%	2500	2750	3025	3325	3660	
	15%	2500	2875	3305	3800	4370	

Unclassified

	25%	2500	3125	3905	4880	6100	
10% growth							
FY 01	2500 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 1,651	\$ 19,817	\$ 964	\$ 11,564	\$ 1,305	\$ 15,664
	Avg (37%)	\$ 1,805	\$ 21,662	\$ 1,056	\$ 12,675	\$ 1,431	\$ 17,168
	High (50%)	\$ 1,976	\$ 23,717	\$ 1,156	\$ 13,877	\$ 1,566	\$ 18,797
FY02	2750 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 1,817	\$ 21,799	\$ 1,060	\$ 12,721	\$ 1,436	\$ 17,231
	Avg (37%)	\$ 1,986	\$ 23,828	\$ 1,162	\$ 13,942	\$ 1,574	\$ 18,885
	High (50%)	\$ 2,174	\$ 26,089	\$ 1,272	\$ 15,265	\$ 1,723	\$ 20,677
FY03	3025 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 1,998	\$ 23,979	\$ 1,166	\$ 13,993	\$ 1,579	\$ 18,954
	Avg (37%)	\$ 2,184	\$ 26,211	\$ 1,278	\$ 15,336	\$ 1,731	\$ 20,774
	High (50%)	\$ 2,391	\$ 28,698	\$ 1,399	\$ 16,792	\$ 1,895	\$ 22,745
FY04	3325 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 2,196	\$ 26,357	\$ 1,282	\$ 15,381	\$ 1,736	\$ 20,834
	Avg (37%)	\$ 2,401	\$ 28,810	\$ 1,405	\$ 16,857	\$ 1,903	\$ 22,834
	High (50%)	\$ 2,629	\$ 31,544	\$ 1,538	\$ 18,457	\$ 2,083	\$ 25,000
FY05	3600 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 2,418	\$ 29,012	\$ 1,411	\$ 16,930	\$ 1,911	\$ 22,933
	Avg (37%)	\$ 2,643	\$ 31,713	\$ 1,546	\$ 18,556	\$ 2,095	\$ 25,134
	High (50%)	\$ 2,893	\$ 34,722	\$ 1,693	\$ 20,316	\$ 2,293	\$ 27,519
Totals	FY01	FY02	FY03	FY04	FY05	Total FY01-05	
	2500	2750	3025	3325	3660		
Avg/low	\$ 15,664	\$ 17,231	\$ 18,954	\$ 20,834	\$ 22,933	\$ 95,616	
Avg/avg	\$ 17,168	\$ 18,885	\$ 20,774	\$ 22,834	\$ 25,134	\$ 104,795	
Avg/high	\$ 18,797	\$ 20,677	\$ 22,745	\$ 25,000	\$ 27,519	\$ 114,739	
15% growth							
FY 01	2500 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 1,651	\$ 19,817	\$ 964	\$ 11,564	\$ 1,305	\$ 15,664
	Avg (37%)	\$ 1,805	\$ 21,662	\$ 1,056	\$ 12,675	\$ 1,431	\$ 17,168
	High (50%)	\$ 1,976	\$ 23,717	\$ 1,156	\$ 13,877	\$ 1,566	\$ 18,797

Unclassified

FY02	2875 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 1,899	\$ 22,790	\$ 1,108	\$ 13,299	\$ 1,501	\$ 18,014
	Avg (37%)	\$ 2,076	\$ 24,911	\$ 1,215	\$ 14,576	\$ 1,645	\$ 19,743
	High (50%)	\$ 2,273	\$ 27,275	\$ 1,330	\$ 15,959	\$ 1,801	\$ 21,617
FY03	3305 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 2,183	\$ 26,198	\$ 1,274	\$ 15,288	\$ 1,726	\$ 20,708
	Avg (37%)	\$ 2,386	\$ 28,637	\$ 1,396	\$ 16,756	\$ 1,891	\$ 22,696
	High (50%)	\$ 2,613	\$ 31,354	\$ 1,529	\$ 18,346	\$ 2,071	\$ 24,850
FY04	3800 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 2,510	\$ 30,122	\$ 1,465	\$ 17,578	\$ 1,984	\$ 23,810
	Avg (37%)	\$ 2,744	\$ 32,926	\$ 1,605	\$ 19,265	\$ 2,175	\$ 26,096
	High (50%)	\$ 3,004	\$ 36,050	\$ 1,758	\$ 21,094	\$ 2,381	\$ 28,572
FY05	4370 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 2,887	\$ 34,640	\$ 1,685	\$ 20,214	\$ 2,282	\$ 27,381
	Avg (37%)	\$ 3,155	\$ 37,865	\$ 1,846	\$ 22,155	\$ 2,501	\$ 30,010
	High (50%)	\$ 3,455	\$ 41,458	\$ 2,021	\$ 24,258	\$ 2,738	\$ 32,858
	FY01	FY02	FY03	FY04	FY05	Total FY01-05	
	2500	2875	3305	3800	4370		
Avg/low	\$ 15,664	\$ 18,014	\$ 20,708	\$ 23,810	\$ 27,381	\$ 105,578	
Avg/avg	\$ 17,168	\$ 19,743	\$ 22,696	\$ 26,096	\$ 30,010	\$ 115,714	
Avg/high	\$ 18,797	\$ 21,617	\$ 24,850	\$ 28,572	\$ 32,858	\$ 126,694	
25% growth							
FY 01	2500 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 1,651	\$ 19,817	\$ 964	\$ 11,564	\$ 1,305	\$ 15,664
	Avg (37%)	\$ 1,805	\$ 21,662	\$ 1,056	\$ 12,675	\$ 1,431	\$ 17,168
	High (50%)	\$ 1,976	\$ 23,717	\$ 1,156	\$ 13,877	\$ 1,566	\$ 18,797
FY02	3125 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 2,064	\$ 24,771	\$ 1,205	\$ 14,455	\$ 1,632	\$ 19,581
	Avg (37%)	\$ 2,256	\$ 27,077	\$ 1,320	\$ 15,843	\$ 1,788	\$ 21,460
	High (50%)	\$ 2,471	\$ 29,646	\$ 1,446	\$ 17,347	\$ 1,958	\$ 23,497
FY03	3905 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 2,580	\$ 30,954	\$ 1,505	\$ 18,063	\$ 2,039	\$ 24,468

Unclassified

	Avg (37%)	\$ 2,820	\$ 33,835	\$ 1,650	\$ 19,798	\$ 2,235	\$ 26,817
	High (50%)	\$ 3,087	\$ 37,046	\$ 1,806	\$ 21,676	\$ 2,447	\$ 29,361
FY04	4880 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 3,224	\$ 38,683	\$ 1,881	\$ 22,574	\$ 2,548	\$ 30,577
	Avg (37%)	\$ 3,524	\$ 42,284	\$ 2,062	\$ 24,741	\$ 2,793	\$ 33,512
	High (50%)	\$ 3,858	\$ 46,296	\$ 2,257	\$ 27,089	\$ 3,058	\$ 36,692
FY05	6100 Users	Monthly	Annually	Monthly	Annually	Monthly	Annually
Savings	Rank	O-4	O-4	E-7	E-7	Avg	Avg
	Low (25%)	\$ 4,029	\$ 48,354	\$ 2,351	\$ 28,217	\$ 3,185	\$ 38,221
	Avg (37%)	\$ 4,405	\$ 52,854	\$ 2,577	\$ 30,926	\$ 3,491	\$ 41,890
	High (50%)	\$ 4,822	\$ 57,870	\$ 2,822	\$ 33,861	\$ 3,822	\$ 45,866
	FY01	FY02	FY03	FY04	FY05	Total FY01-05	
	2500	3125	3905	4880	6100		
Avg/low	\$ 15,664	\$ 19,581	\$ 24,468	\$ 30,577	\$ 38,221	\$ 128,511	
Avg/avg	\$ 17,168	\$ 21,460	\$ 26,817	\$ 33,512	\$ 41,890	\$ 140,848	
Avg/high	\$ 18,797	\$ 23,497	\$ 29,361	\$ 36,692	\$ 45,866	\$ 154,213	
	Actual Savings @ 20% Utilization						
	FY01	FY02	FY03	FY04	FY05	Total	
10% growth	3,133	3,446	3,791	4,167	4,587	19,123	
	3,434	3,777	4,155	4,567	5,027	20,959	
	3,759	4,135	4,549	5,000	5,504	22,948	
15% growth	3,133	3,603	4,142	4,762	5,476	21,116	
	3,434	3,949	4,539	5,219	6,002	23,143	
	3,759	4,323	4,970	5,714	6,572	25,339	
25% growth	3,133	3,916	4,894	6,115	7,644	25,702	
	3,434	4,292	5,363	6,702	8,378	28,170	
	3,759	4,699	5,872	7,338	9,173	30,843	
			10% growth	15% growth	25% growth		
			# Of accts	# Of accts	# Of accts		
FY01	Breakeven Hours	Breakeven Users/mo	2500	2500	2500		
			Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates		
Avg/Low	287,275	1596	63.8%	63.8%	63.8%		
Avg/Avg	262,112	1456	58.2%	58.2%	58.2%		

Unclassified

Avg/High	239,396	1330	53.2%	53.2%	53.2%		
			# Of accts	# Of accts	# Of accts		
FY02			2750	2875	3125		
			Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates		
Avg/Low	258,547	1436	52.2%	49.9%	46.0%		
Avg/Avg	235,901	1310	47.6%	45.6%	41.9%		
Avg/High	215,456	1196	43.5%	41.6%	38.3%		
			# Of accts	# Of accts	# Of accts		
FY03			3025	3305	3905		
			Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates		
Avg/Low	258,547	1436	47.5%	43.4%	36.8%		
Avg/Avg	235,901	1310	43.3%	39.6%	33.5%		
Avg/High	215,456	1196	39.5%	36.2%	30.6%		
			# Of accts	# Of accts	# Of accts		
FY04			3325	3800	4880		
			Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates		
Avg/Low	229,820	1277	38.4%	33.6%	26.2%		
Avg/Avg	209,690	1165	35.0%	30.7%	23.9%		
Avg/High	191,516	1064	32.0%	28.0%	21.8%		
			# Of accts	# Of accts	# Of accts		
FY05			3660	4370	6100		
			Breakeven Utilization rates	Breakeven Utilization rates	Breakeven Utilization rates		
Avg/Low	224,074	1245	34.0%	28.5%	20.4%		
Avg/Avg	204,448	1135	31.0%	26.0%	18.6%		
Avg/High	186,729	1037	28.3%	23.7%	17.0%		

IPT Review of JTAV Economic Analysis**APPENDIX F: IPT Comments and Replies**

Joint Total Asset Visibility (JTAV)

Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
A1	LOIA-LS	3	Admin		124	U	It is unclear whether this is solely evaluating the CINC/JTF initiative or looking broader. Should clarify exactly what this applies to. Initial JDTAV Charter indicated the office would be responsible for ensuring requirements satisfied by component automated information systems. This did mean by developing a Global TAV system.	P

A1: LOIA-LS. Partially concur. The wording of the EA does not specify one management approach over another, but looked at the DoD Requirements that JTAV is tasked to meet, as outlined in the JTAV Charter, ORD, and Strategic Plan. The JTAV Operational Requirements Document and the JTAV Strategic Plan (Jan 99) discuss the current requirement for both the regional CINC servers as well as a continuing requirement for a global server to provide an integrated, global picture. This EA doesn't differentiate between the documented requirements, but rather looks at how JTAV resources can best be used to meet those requirements.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C1	LOIA-LS	4	Critical	4.3	186	U	Army position is that JTAV will not have direct access to Army STAMIS. Only through ATAV will this data be provided.	P

Partially Concur. The JTAV Office accepts this answer as the Army's position for meeting the GCSS Capstone Requirements Document (5 Jun 00) for access to "authoritative source systems". As a joint system, however, other services without an ATAV equivalent may provide more direct access to a lower level source system.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C2	LOIA-LS	6	Critical		212	U	The JTAV Office is to ensure Component automated information systems satisfy the DTAV requirement--not to develop a Global JTAV System.	R

C2: LOIA-LS. Rejected. Both the JTAV ORD and the JTAV Strategic Plan discuss a global information requirement. JTAV has chosen to focus on developing the regional, CINC level capability first. A global information requirement remains valid, even though current funding levels for JTAV through FY05 will not support this requirement.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
S1	LOIA-LS	7	Substantive		231	U	Accuracy and timeliness of data may not be any better than current method of accessing data. Today the Army has an ATAV DIWG working data issues-- and by the way many of them are source data problems.	P
S2	LOIA-LS	7	Substantive		231	U	Having data modernization and training will not necessarily attract more users. This is an assumption on the users part without any facts to back it up.	R

S1: LOIA-LS. Partially Concur. The JTAV and GCSS requirements are to reduce data latency and improve accuracy and timeliness of data through access to authoritative source systems. Even data received directly from a source system is only as good as the quality of the source data. Some systems may already be providing data to JTAV at near real time. However, intermediate data warehouses and systems between JTAV and the source data increases data latency, and also increases the potential for data loss and/or corruption, either through accidental or deliberate hostile actions.

S2: LOIA-LS. Rejected. An Officer Professional Development class presented in Feb 00 to US Joint Forces Command reservists on their weekend drill was the first exposure for many of these officers to JTAV. One officer, whose civilian job with the Military Traffic Management Command required him to access data that JTAV provides, quickly saw the value of JTAV to his organization and contacted the JFCOM on-site JTAV team to provide training on JTAV to the 30+ people in his office in Ft. Eustis. This is only one instance of many of training in JTAV. At the GCSS CINC 129 Requirements IPT, the GCSS Functional Requirements Office representatives clearly stated that JTAV currently doesn't meet the CINC requirements because the data is not real time. JCS J4 personnel talking to the CINCs and their staffs about their requirements generated these requirements. Many of them said that JTAV would be more valuable if the data was timelier. Others said that JTAV would be more valuable if it included information they needed such as National Guard and Reserve unit information. These are not assumptions; these are based on comments from the field, and actual experiences.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C3	LOIA-LS	8	Critical		251	U	Training should be in the schoolhouses--not a team that goes on the road to do training. If we have already spent \$90+M dollars to develop a system, we should already have figured out why users were not using the system.	P

C3: LOIA-LS. Partially Concur. Briefings and demonstrations on the JTAV capability have been added to the curriculum of the Joint Course on Logistics. Recently, training was added to other courses as well, including the Logistics Executive Development Course (LEDC) and is planned for the Army's Combined Logistics Captains Career Course (CLC3). The JTAV Office would welcome any opportunity to discuss with any Service other courses or schools where potential JTAV users are trained and where JTAV training can be institutionalized. While all of these schoolhouse environments represent significant advances in promoting the JTAV capability, there are still many personnel who can benefit from JTAV who will not go to these schools. An example was noted in the previous reply where a reservist at JFCOM received a demonstration of JTAV during drill, and subsequently scheduled a hands-on training for his entire office of over 30 people at MTMC. That Air Force officer (Major) would not have been in the schoolhouses where JTAV is currently being taught. As part of its strategy, the JTAV Office should recognize this segment of the population who will not pass through military schoolhouses. The JTAV Office has done some follow-up with users about their experience with the system, but as part of a comprehensive, more customer based focus consistent with the DLA 2010 vision, the possibility for doing a large-scale survey of JTAV users may provide valuable insight as to why users are not using the system.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C4	LOIA-LS	9	Critical		301	U	Believe the Clinger-Cohen Act required system developers to perform economic analysis prior to doing any development.	P

C4: LOIA-LS. Partially Concur. The JTAV Office and capability was established before the Clinger Cohen Act was enacted. Subsequent DOD decisions about the JTAV acquisition program classification did not require an EA before development was started. The statement is generally correct, however, in that the CC Act does require that IT investments are reviewed and provide value to DoD. The subsequent paragraphs of the EA in the section being commented on provide an explanation as to why an EA is being done for a program already in development.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
A2	LOIA-LS	9	Administrative		290	U	Was it really DLA that wanted more formalized controls or did GAO audit cause this to become critical?	R

A2. LOIA-LS. Rejected. The GAO Audits and transfer to DLA executive agency occurred at approximately the same time. It is not the role of this EA to judge what prompted DLA's decisions, only to address the fact that DLA, as executive agent, imposed stricter requirements for acquisition accountability on the JTAV Office.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C5	LOIA-LS	11	Critical		381	U	In this paragraph they identify 930 account holders in EUCOM. How many actually use it on a regular basis and are these folks employed by the CINC or the JTAV Office as on-site support? Need to be more specific on what is actually happening--not make broad assumptions.	A

C5. LOIA-LS. Accepted. While the 930 users was used in the context of this paragraph as a means to show the growth rate of JTAV, to answer the Army's questions, the following data is provided. Of the 930 account holders in March 2000, 128 people accessed the system, 115 users and 13 contractors. The users generated 2858 queries, while the contractors generated 773. This equates to a ratio of queries by actual users Vs contractors of 79% to 21%. In April 2000, 952 accounts had been issued, and increase of 22 or 2.36% from the previous month. Of these, 121 account holders accessed the system, 109 users and 12 contractors. The users generated 2598 queries, while the contractors generated 609. This created the user to contractor query ratio of 81% to 19%. For both months, the actual number of users logging on to use the system Vs the number of account holders was steady at 11-12% utilization. This usage data was used to generate the assumption on growth rates that, while actually growing at rates of between 50 and 220 percent annually, was set at a sustainable 10-25% for EA purposes.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C6	LOIA-LS	12	Critical		408	U	Assumes person uses JTAV all day long, every day. Not good assumption. Probably only uses it a portion of a day and maybe not every day. Again broad assumptions--not facts.	R

C6. LOIA-LS. Rejected. This part of the EA is the assumptions, and the wording in question pertains only to the work hours of a JTAV user being 1920 man-hours per year. This does not assume that the person is using JTAV the entire time. Discussions about timesavings are found later in section 5, and are based on JTAV saving a CINC staff member, on average, 15 hours of time per month out of an average of 174 working hours per month, a timesaving of just over 8.5%. These savings are based on experience and feedback from users who use JTAV regularly. The JTAV Office concurs, however, that this section was poorly worded and potentially misleading and will re-word for clarity.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C7	LOIA-LS	13	Critical		463	U	Statement talks to a smaller Army yet this is a joint system. Also it talks about new recruits but in fact the folks who are using JTAV, based on the preface up front, are senior people with about 14 years experience.	A

C7. LOIA-LS. Accepted. This paragraph was inadvertently left in the draft, and has been removed. JTAV is a joint system, and the primary users are assumed to be more senior personnel.

IPT Review of JTA V Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C8	LOIA-LS	13	Critical		476	U	Indicates a sample during Feb-Mar 00 showed 20% of actual account holders logged in. Need to define how long they were logged in and how often they logged in.	R

C8. LOIA-LS. Rejected. The data requested is not readily available and is not cost effective to collect and analyze. It would not add additional benefit or clarity to the fact that only about 20% of account holders regularly use the system on a regular basis.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
A3	LOIA-LS	14	Admin		504	U	You show a footnote number but there is no footnote at the bottom of the page as to what this relates to.	A

A3. LOIA-LS. Accepted. The draft has been updated with appropriate footnotes and annotations.

IPT Review of JTAV Economic Analysis

	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C9	LOIA-LS	18	Critical	3.3.4	685	U	Paragraph talks about \$600M will be required across all Services for TAV capability. Yet it does not break it out by service nor does it identify that the bulk of the Army dollars are for AIT hardware and limited software development to support the AIT. The Army's TAV data base has been built since 1996 and is currently only funded for O&M.	R

C9. LOIA-LS. Rejected. The statement was taken from a GAO Audit Report, which did not provide a more robust breakdown of costs or their uses. The statistic was used simply to show that the JTAV program's total lifecycle costs are approximately 23 % of that total.

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	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C10	LOIA-LS	19	Critical	3.3.5	711	U	This statement is not entirely true. While MMSS was abandoned because of cost primarily, it did mean JTAV needed to develop a global TAV capability. What really needed to happen was to work with the Services and DLA to ensure data sharing across Service/DLA lines. That is happening today with OSD directed lateral redistribution and procurement offset.	P

C10. LOIA-LS. Partially Concur. According to the GAO report on the MMSS system, it was abandoned after significant cost overruns. The Global JTAV capability is a requirement, as stated in the ORD and JTAV Strategic Plan. This global capability, if built as envisioned, could have provided some of the same functionality that MMSS was to have provided. Global JTAV has not been built, and other initiatives, such as the lateral redistribution and procurement offset mentioned are providing the wholesale community some global data sharing capabilities.

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	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C11	LOIA-LS	20	Critical	3.3.6	762	U	See comment above. Again Global TAV is not required to provide shared visibility across service lines. In addition, JTAV Office is to do no new development, so I am unsure why they are even addressing this in the EA.	P

C11. LOIA-LS. Partially Concur. See comments above. The Global JTAV requirement is included in this EA because it is still a requirement as mentioned in the ORD and JTAV Strategic Plan. It remains unfunded and based on current decisions regarding JTAV development, will not be developed. However, the potential economic benefit of a global JTAV capability, to meet the shortcomings found by the GAO and others regarding the wholesale community, is still valid and is included to provide a complete picture of the current and potential value of the JTAV capability.

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	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C12	LOIA-LS	21	Critical	3.3.8	813	U	Need to identify how many of the seven CINC's included it as funded.	R

C12. LOIA-LS. Rejected. IPL priorities are classified. Relative placement on CINC IPLS considered inappropriate for an unclassified EA.

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	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C13	LOIA-LS	22	Critical	3.5	873	U	User training should be embedded in the schoolhouses--not by having contractors do road shows/training.	P

C13. LOIA-LS. Partially Concur. See comment under C3. Not all training can be done in a schoolhouse environment for all users.

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	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C14	LOIA-LS	24	Critical	4.4	952	U	Marketing should be covered by including articles in magazines and training should be included by covering in the schoolhouses. Much cheaper than road shows.	P

C14. LOIA-LS. Partially Concur. Articles in targeted periodicals have heightened awareness of JTAV. This alternative recommends additional measures to promote the JTAV capability. When marketing is successful, users will want to know how to get the JTAV capability for themselves. While the schoolhouse solutions can reach a concentrated target audience, there are many more potential users, especially reserve and National Guard members, who cannot/will not cycle through formal military schools. This audience is the target that would be reached through other methods, possibly including a road show or on-site training during drill weekends.

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	ORG	Page #	Type	Para #	Line #	Class	Comments	A/R/P
C15	LOIA-LS	26	Critical	5.3.2	1034	U	Again training should be conducted in the schoolhouses. Other more cost effectiveness avenues should be found for marketing the initiative.	P

C15. LOIA-LS. Partially Concur. See comment C3 and C14. This EA does not recommend a specific method for the JTAV Office to train users. It simply recognizes that JTAV is a product that is used by customers. Money can be spent to either improve the product, which is the technological solutions; or to focus on the customers and what their exposure and satisfaction with the current product is. Under the very basic metric used in this EA, number of hours saved per user, any investment strategy that increases the number of users, and thereby the number of hours they save over current processes, should be evaluated and considered.

IPT Review of JTA V Economic Analysis

ORG	NA	NA	NA	NA	POC NAME and TELEPHONE LIST	
ARMY LOIA					Name: Cecelia Butler TELEPHONE: 703- 767-7063	