

GAO

Report to the Subcommittee on
Readiness and Management Support,
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DOD SYSTEMS MODERNIZATION

Uncertain Joint Use
and Marginal
Expected Value of
Military Asset
Deployment System
Warrant Reassessment
of Planned Investment





Highlights of [GAO-06-171](#), a report to the Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate

Why GAO Did This Study

Because of the importance of the Department of Defense's (DOD) adherence to disciplined information technology (IT) acquisition processes in successfully modernizing its business systems, GAO was asked to determine whether the Transportation Coordinators' Automated Information for Movements System II (TC-AIMS II) program is being managed according to important aspects of DOD's acquisition policies and guidance, as well as other relevant acquisition management best practices. TC-AIMS II was initiated in 1995 as a joint services system to help manage force and equipment movements within the United States and abroad. The U.S. Department of the Army has the lead responsibility for managing the system's acquisition and estimates its life-cycle cost to be \$1.7 billion over 25 years.

What GAO Recommends

GAO is making recommendations to the Secretary of Defense to, among other things, develop the analytical basis needed to determine if continued investment in TC-AIMS II, as planned, represents prudent use of limited defense resources. In written comments on a draft of this report, DOD concurred or partially concurred with GAO's recommendations. It also described planned actions that are largely consistent with GAO's recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-06-171.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Randolph C. Hite at (202) 512-3439 or hiter@gao.gov.

DOD SYSTEMS MODERNIZATION

Uncertain Joint Use and Marginal Expected Value of Military Asset Deployment System Warrant Reassessment of Planned Investment

What GAO Found

The Army has managed the TC-AIMS II program in accordance with some, but not all, key aspects of DOD's system acquisition management policies and related guidance. These policies and guidance are intended to reasonably ensure that investment in a given IT system represents the right solution to fill a mission need—and, if it does, that acquisition and deployment of the system are handled in a manner that maximizes the chances of delivering defined system capabilities on time and within budget. The Army has not managed the program in accordance with those DOD policies and related guidance, including related federal and other best practice guidance, that are intended to reasonably ensure that a proposed system is the right solution to meet mission needs. Specifically:

- The Army has not economically justified its investment in TC-AIMS II on the basis of reliable estimates of costs and benefits. For example, the most recent economic justification included cost and benefit estimates predicated on all four military services using the system. However, two services (U.S. Department of the Air Force and U.S. Marine Corps) have stated that they do not intend to use it.
- The Army has not invested in TC-AIMS II within the context of a well-defined enterprise architecture, which is an institutional blueprint to control program investment decisions in a way that promotes interoperability and reduces redundancy among systems. The Army has instead focused on aligning TC-AIMS II with its logistics architecture; this means that even though TC-AIMS II is intended to be a DOD-wide program, it has been based on a service-specific architecture rather than a DOD-wide architecture. As a result, it may not properly fit within departmentwide plans.

To its credit, the Army has largely managed the program in accordance with key policies and related guidance that are intended to reasonably ensure that the acquisition and deployment of a given system are handled in a manner that maximizes the chances of delivering defined capabilities on time and within budget. However, some aspects of this policy and guidance have not been followed. For example, the Army has not fully implemented risk management and has not adhered to a key feature of performance-based contracting.

Reasons the Army cited for not following policies and guidance ranged from management inattention to lack of training. As a result, the Army, among other things, does not know whether the system is the right solution. Until this uncertainty and the previously discussed problems are addressed, it will remain unclear whether further planned investment in TC-AIMS II is warranted, and certain aspects of the program's management will be limited.

Contents

Letter		1
	Results in Brief	2
	Background	4
	TC-AIMS II Has Not Been Managed in Accordance with Certain DOD System Acquisition Policies and Related Guidance	10
	Conclusions	24
	Recommendations for Executive Action	25
	Agency Comments and Our Evaluation	26

Appendixes		
	Appendix I: Objective, Scope, and Methodology	32
	Appendix II: Assessment of Problem Reports	36
	Appendix III: Comments from the Department of Defense	38
	Appendix IV: GAO Contact and Staff Acknowledgments	46

Table	Table 1: TC-AIMS II Management Entities and Their Roles and Responsibilities	8
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Figures	Figure 1: TC-AIMS II Acquisition, Operations, and Maintenance Timeline, by Fiscal Year	7
	Figure 2: Number of Problem Reports, Fiscal Years 1999 through 2005	37

Abbreviations

DOD	Department of Defense
IT	information technology
TC-AIMS II	Transportation Coordinators' Automated Information for Movements System II

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United States Government Accountability Office
Washington, D.C. 20548

December 15, 2005

The Honorable John Ensign
Chairman
The Honorable Daniel K. Akaka
Ranking Minority Member
Subcommittee on Readiness and Management Support
Committee on Armed Services
United States Senate

Because it is so important that the Department of Defense (DOD) adhere to disciplined information technology (IT) acquisition processes in order to successfully modernize its business systems, you requested that we determine whether the department is following its own IT acquisition policies and guidance, which were recently revised.¹ As part of our response to your request, we agreed to review the Transportation Coordinators' Automated Information for Movements System II (TC-AIMS II) program. TC-AIMS II was initiated in 1995 by DOD as a joint services system with the goal of helping to manage the movement of forces and equipment within the United States and abroad. Assigned the lead responsibility for acquiring the system, the U.S. Department of the Army estimates the system has a 25-year, life-cycle cost of \$1.7 billion.

Our objective was to determine whether TC-AIMS II is being managed according to important aspects of DOD's acquisition policies and guidance as well as other relevant acquisition management best practices. We focused on the program's (1) economic justification; (2) architectural alignment; (3) risk management; (4) requirements development and management; (5) commercial component management; and (6) contract management, including contractor oversight and performance-based contracting.

We conducted our work between October 2004 and October 2005, in accordance with generally accepted government auditing standards. Details of our objective, scope, and methodology are included in appendix I.

¹DOD, Department of Defense Directive Number 5000.1, *The Defense Acquisition System* (May 12, 2003); Department of Defense Instruction Number 5000.2, *Operation of the Defense Acquisition System* (May 12, 2003); and *Defense Acquisition Guidebook*, Version 1.0 (Oct. 17, 2004).

Results in Brief

The Army has managed the TC-AIMS II program in accordance with some, but not all, key aspects of DOD's system acquisition management policies and related guidance. Collectively, DOD's acquisition management policies and guidance are intended to reasonably ensure that investment in a given IT system represents the right solution to fill a mission need—and, if it does, that acquisition and deployment of the system are handled in a manner that maximizes the chances of delivering defined system capabilities on time and within budget. In particular, the Army has not managed TC-AIMS II in accordance with DOD policy and related guidance, including related federal and other best practice guidance, that are intended to reasonably ensure that a proposed system is the right solution to meeting mission needs.

- The Army has not economically justified its investment in TC-AIMS II on the basis of reliable estimates of costs and benefits. The most recent economic justification included cost and benefit estimates predicated on all four military services using the system. However, two services (U.S. Department of the Air Force and U.S. Marine Corps) have stated that they do not intend to use it. Even with costs and benefits for all four services included, the analysis showed a marginal return on investment; that is, for each dollar spent on the system, slightly less than one dollar of benefit would be returned.
- The Army has not invested in TC-AIMS II within the context of a well-defined enterprise architecture, which is an institutional blueprint to guide and constrain program investment decisions in a way that promotes interoperability and reduces redundancy among related and dependent systems. As we recently reported,² the version of the department's business enterprise architecture that has been available to the program has not contained sufficient context (depth and scope of operational and technical requirements) to effectively guide and constrain system investments. The Army has instead focused on aligning TC-AIMS II with the Army's logistics architecture; this means that even though TC-AIMS II was to be a DOD-wide program, it has been based on a service-specific architecture, rather than a DOD-wide architecture. As

²GAO, *DOD Business Systems Modernization: Long-standing Weaknesses in Enterprise Architecture Development Need to Be Addressed*, [GAO-05-702](#) (Washington, D.C.: July 22, 2005).

a result, the system, as defined, may not properly fit within a DOD-wide enterprise architecture.

At the same time, the Army has largely managed the program in accordance with key policies and related guidance that are intended to reasonably ensure that the acquisition and deployment of a given system solution are handled in a manner that maximizes the chances of delivering defined capabilities on time and within budget. However, aspects of this policy and guidance have not been followed.

- The Army has not fully implemented the department's risk management policy and guidance. While the program office has developed a risk management plan, it has not effectively implemented it. For example, the program office identified 22 active risks to the program but only developed mitigation strategies for 16 of these risks, increasing the probability that program risks will lead to cost, schedule, and performance problems.
- The Army has not implemented a key feature of performance-based contract management. Specifically, the most recent contract to acquire TC-AIMS II does not specify effective disincentives or penalties for the contractor if it fails to meet performance criteria. Among other things, this limits the Army's ability to effectively influence contractor performance.

Reasons that the Army cited for not following relevant policies and guidance include lack of management attention and training. By not following them, the Army does not have an adequate basis to know whether TC-AIMS II is the right systems solution to meet DOD's asset deployment support needs, and, thus, it is unclear whether planned investment in TC-AIMS II is warranted. Even if the uncertainty is adequately addressed, the manner in which the system is being acquired can be strengthened. Accordingly, we are making recommendations to the Secretary of Defense that are aimed at first developing the basis for determining whether continued investment in TC-AIMS II is a prudent use of limited resources. We are also making recommendations, conditional upon a decision by DOD to proceed with further investment in TC-AIMS II, to further enhance the department's adherence to other acquisition practices.

The Office of the Assistant Secretary of Defense for Networks and Information Integration provided written comments on a draft of this

report. In its comments, the department stated that it either concurred or partially concurred with our recommendations. It also described efforts initiated or planned to bring the program into compliance with applicable guidance. In our view, the department's comments are largely consistent with our report. These comments, along with our responses, are discussed in detail in the Agency Comments and Our Evaluation section of this report. The DOD comments are also reprinted in their entirety in appendix III.

Background

As one of the largest and most complex organizations in the world, DOD spends billions of dollars each year to operate, maintain, and modernize IT systems that support core business operations. These business operations consist of various interrelated and interdependent business functions, including logistics management, procurement, health care management, and financial management. Further, execution of these business operations span a wide range of defense organizations, including the military services and their respective major commands and functional activities, defense agencies and field activities, and combatant and joint operational commands that are responsible for military operations in geographic regions or theaters. For fiscal year 2005, DOD requested approximately \$13 billion to operate, maintain, and modernize about 4,150 business systems and related IT infrastructure. The Army's share of this funding and systems is about \$2.7 billion and 727 systems.

In 1995, we designated DOD's business systems modernization efforts as a high-risk program, and we continue to designate it as such today³ for several reasons, including the department's challenges in implementing effective IT investment management structures and processes, developing and implementing an enterprise architecture, and implementing effective IT system acquisition and development processes.

Overview of TC-AIMS II Genesis, Purpose, and Acquisition Strategy

In the early 1990s, DOD recognized the need to integrate defense IT systems by ordering the consolidation of systems that serve multiservice purposes. Accordingly, it directed that approximately 150 operating transportation systems be evaluated for consolidation opportunities. In 1995, DOD initiated TC-AIMS II as one of a number of programs that were

³GAO, *High-Risk Series: An Update*, [GAO-05-207](#) (Washington, D.C.: January 2005).

commenced following this evaluation to consolidate and replace existing systems, and to automate transportation management function areas for all services. In doing so, DOD designated the Army as the “executive agent” responsible for managing TC-AIMS II, including acquiring the system.

Expected TC-AIMS II benefits included enhancing and improving the efficiency and effectiveness of the support planning needed to deploy and redeploy forces and equipment, both within the United States and abroad; improving the visibility of assets; and enhancing cargo and passenger receiving, controlling, and shipping. The system is also expected to enable decision makers at various command levels to access information about unit movement and installation transportation, and is to provide key shared functionality related, for example, to load planning.

The Army defined the following five-block acquisition and implementation strategy for TC-AIMS II. According to the strategy, each block is to address a functional portion of the requirements.

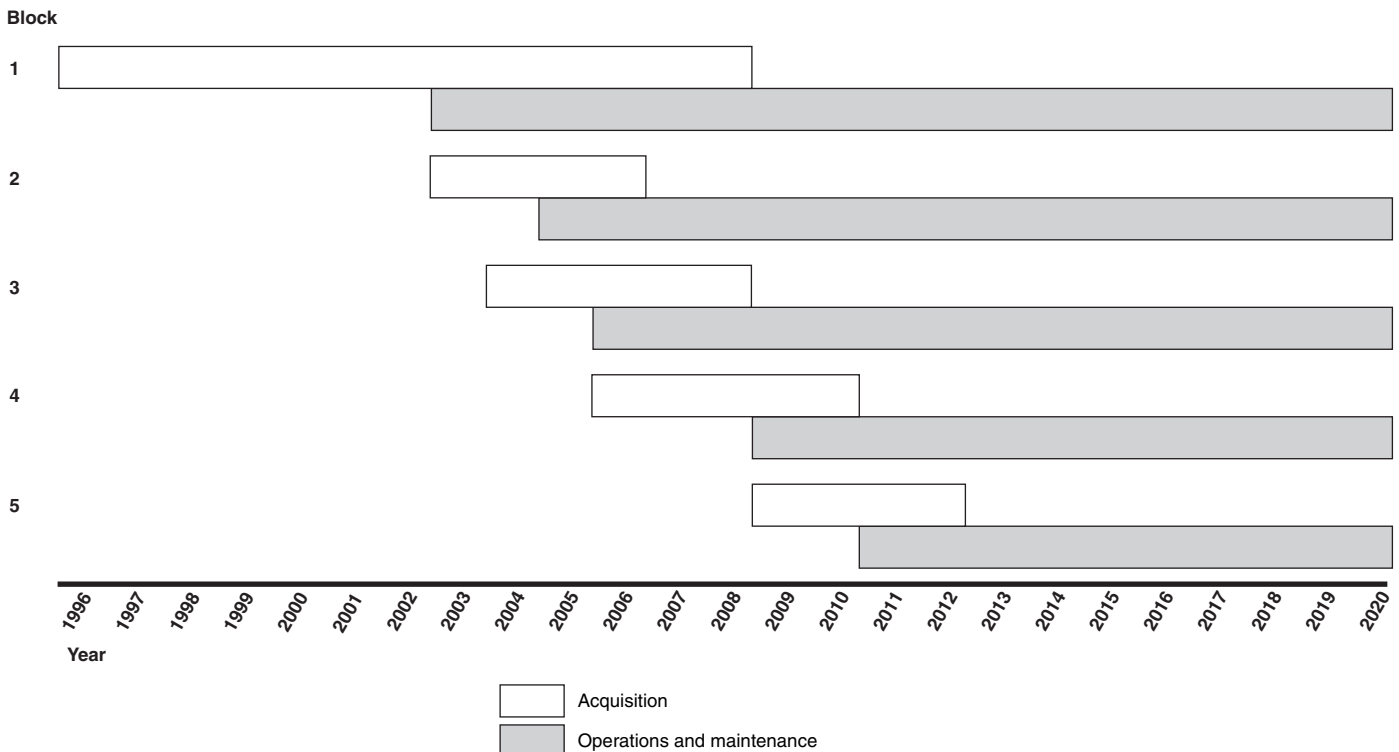
- *Block 1:* This block is to import data about assets (people, equipment, and supplies) from the services’ existing systems and is to manage these data to (1) plan and execute organizational moves (i.e., provide documentation, packing and shipping labels, and orders) and (2) request and schedule strategic and local transportation vehicles (e.g., trucks, ships, airplanes, motor pools, and trucks).
- *Block 2:* This block is to add Web access to permit automated data exchange with related systems, such as airlift load planning systems and global transportation networks. This increment is to link and track cargo and personnel (via DOD’s standard smart cards), and their corresponding transports. It also is to generate and manage the documentation associated with these functions.
- *Block 3:* This block is to add interfaces to both supply and personnel systems to facilitate control over “in theater” operations, such as reception (unit arrival and off-loading in theater), staging (preparation for departure to assigned locations), onward movement (transit to assigned locations), and integration (coordinating and linking the movement of multiple related units). It also is to generate and manage documentation associated with these functions.
- *Block 4:* This block is to add the capability to manage maritime forces associated with prepositioned equipment and cargo (e.g., tank

ammunition for an armored cavalry unit), including the ability to manage cargo logistics (loading and off-loading), as well as greater capability to manage theater operations, including the availability, distribution, and dispatch of vehicle fleets and drivers. It also is to generate and manage documentation associated with these functions.

- *Block 5:* This block is to automate the management of transportation assets and traffic operations at military installations both in the United States and worldwide. At this point, TC-AIMS II is to be able to generate and manage all data and documentation related to moving units within DOD's transportation system. As part of this block, the interfaces to systems that are to be integrated with TC-AIMS II are to be upgraded or created, as required, in response to changes in technology.

Figure 1 shows the Army's timeline for acquiring the five TC-AIMS II blocks. In particular, the Army reports that it is currently acquiring Block 3 with the goal of making it operational by late 2006.

Figure 1: TC-AIMS II Acquisition, Operations, and Maintenance Timeline, by Fiscal Year



Source: GAO analysis based on DOD data.

The Army estimates the total life-cycle cost of TC-AIMS II to be \$1.7 billion over 25 years, including \$569 million for acquisition and \$1,168 million for operations and maintenance. The Army reports that it has spent approximately \$751 million on TC-AIMS II since its inception.

Description of TC-AIMS II Roles and Responsibilities

A number of DOD and Army organizations are involved in managing the TC-AIMS II program and acquisition. Briefly, they are as follows:

- The Assistant Secretary of Defense for Network Information and Integration, who has overall responsibility for the program.
- The Army’s Program Executive Office for Enterprise Information Systems, Transportation Information Systems, oversees the

management of TC-AIMS II, which is managed on a day-to-day basis by the Project Manager, Joint Program Management Office.

- The Joint Requirements Board represents TC-AIMS II users and includes stakeholders from the military services and other DOD organizations. The board is responsible for managing TC-AIMS II requirements development activities.

These and other key organizations and their roles and responsibilities are described in more detail in table 1.

Table 1: TC-AIMS II Management Entities and Their Roles and Responsibilities

Entity	Roles and responsibilities
Assistant Secretary of Defense for Network Information and Integration	Serves as the chair of the TC-AIMS II IT integrated product team and is the milestone decision authority. Assigned overall responsibility for the TC-AIMS II program; approves the program to proceed through its acquisition cycle on the basis of a review of key documents, such as an acquisition plan, an independently evaluated life-cycle cost-and-benefit estimate, Acquisition Program Baseline documents, and Defense Acquisition Executive Summary reports.
Department of the Army, Program Executive Office for Enterprise Information Systems, Transportation Information Systems	Serves as the program executive office. Assigned overall responsibility for TC-AIMS II program oversight; reviews the component cost analysis, acquisition strategy, and Acquisition Program Baseline prior to approval by the milestone decision authority.
Joint TC-AIMS II Management Board	Provides guidance and vision for TC-AIMS II. This board includes representatives from the Joint Command, Transportation Command, and the Military Services, including the U.S. Departments of the Air Force, Army, and Navy and the U.S. Marine Corps.
Joint Program Management Office	Serves as the program office. Assigned responsibility for day-to-day program management of TC-AIMS II and, as such, is the single point of accountability for managing the program's objectives through development, production, and sustainment, including risk management, management of commercial components, and contractor tracking and oversight. Manages cost, schedule, and performance reporting. Prepares and updates the acquisition strategy, component cost analysis, and acquisition program baselines. Coordinates all testing activities with requirements, including measuring system quality and managing problem reports ^a and change requests.
Joint Requirements Board	Represents the system users. Participates in the process of establishing functional requirements. Consists of key system stakeholders and representatives and is chaired by the Joint Forces Command. The board is responsible for managing requirements development activities for TC-AIMS II. Among other things, the board's duties include defining, reviewing, validating, prioritizing, and approving the system's requirements.

Source: GAO analysis of DOD data.

^aProgram officials provided data on, among other things, the number and type of problem reports that the program has encountered since system initiation. For details, see appendix II.

The Army uses a system integration contractor to support the program office in managing the acquisition of TC-AIMS II. Most recently, it awarded a firm, fixed-price contract to a contractor in April 2004 to deliver the Block 3 solution. The contract has 5 option years, which are 1 year in duration. To help it oversee contractor activities, the program office has employed the help of the General Service Administration's Federal Systems Integration and Management Center, whose mission is to provide acquisition management expertise and support to DOD and other federal agencies on large, complex IT projects.

Prior Review Identified Strengths and Weaknesses in DOD's Acquisition Policies and Guidance

In July 2004, we reported⁴ that DOD's revised systems acquisition policies and guidance incorporated many best practices for acquiring business systems, such as (1) justifying system investments economically, on the basis of costs, benefits, and risks, and (2) continually measuring an acquisition's performance, cost, and schedule against approved baselines. However, the revised policies and guidance did not incorporate a number of other best practices, particularly those associated with acquiring commercial component-based business systems, and DOD did not have documented plans for incorporating these additional best practices into its policies. We also reported that the department's revised acquisition policies did not include sufficient controls to ensure that military services and defense agencies would appropriately follow these practices. We concluded that until these additional best practices were incorporated into DOD's acquisition policies and guidance, there was increased risk that department system acquisitions would not deliver planned capabilities and benefits on time and within budget, and increased risk that DOD organizations would not adopt and use best practices that were defined. Accordingly, we made 14 recommendations to the Secretary of Defense that were aimed at strengthening DOD's acquisition policy and guidance by including additional IT systems acquisition best practices and controls for ensuring that these best practices were followed. DOD agreed with most of our recommendations and has since issued additional system acquisition guidance.

⁴GAO, *Information Technology: DOD's Acquisition Policies and Guidance Need to Incorporate Additional Best Practices and Controls*, [GAO-04-722](#) (Washington, D.C.: July 30, 2004).

TC-AIMS II Has Not Been Managed in Accordance with Certain DOD System Acquisition Policies and Related Guidance

The Army, as DOD's acquisition agent for TC-AIMS II, has not managed this program in accordance with certain department acquisition policies, and related guidance, that are intended to reasonably ensure that a proposed system is the right solution to meet mission needs. In particular, the Army has not economically justified the program on the basis of reliable estimates of life-cycle costs and benefits, and it has not ensured that this program, which is intended to produce a departmentwide military deployment management system, is aligned with a departmentwide business enterprise architecture or an integrated blueprint for business systems modernization. As a result, the Army does not know that investment in TC-AIMS II as planned is warranted, represents a prudent use of limited DOD resources, and will be interoperable with and not be duplicative of related systems.

Even if TC-AIMS II happens to be the right system, both economically and architecturally, the Army has not fully implemented risk management and has not fully employed performance-based contracting practices. However, it has largely managed system requirements, commercial components, and contractor tracking and oversight in accordance with DOD policies and related guidance. If the program can be economically justified and architecturally defined, then fully addressing these key acquisition management areas will be essential to the program's success.

Investment in TC-AIMS II Has Not Been Adequately Justified on the Basis of Costs and Benefits

DOD's acquisition management policy and related guidance⁵ recognize the importance of developing reliable economic analyses to support investment decision making. Accordingly, they describe how these analyses should be developed and used. For TC-AIMS II, the Army has not adhered to important aspects of departmental policy and related guidance, such as updating analyses to reflect material changes in program scope and justifying investment in large, multiyear programs on an incremental basis. As a result, the Army currently lacks an adequate basis to justify its planned investment in TC-AIMS II.

⁵For example, see DOD, Department of Defense Directive 5000.1; Department of Defense Instruction 5000.2; Department of Defense Instruction 7041.3, *Economic Analysis for Decision Making* (Nov. 7, 1995); and Office of Management and Budget, Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (Oct. 29, 1992).

Latest Economic Analysis Does Not Recognize System's Uncertain Joint Use and Shows Marginal Expected Value

DOD policy and guidance state that projects should be economically justified on the basis of reliable analyses of expected life-cycle costs and benefits and that cost and benefit estimates should be based on realistic plans for the program's scope. Federal guidance also advocates economically justifying proposed investments on the basis of a benefit-to-cost ratio that is greater than 1, basing that ratio on reliable analyses of expected, quantifiable life-cycle benefits, costs, and risks. The guidance also promotes the calculation and consideration of qualitative benefits in preparing an economic analysis. Further, the guidance calls for updating the analysis when significant program changes occur. These practices help to continually ensure a positive return on investment—even as program changes occur.

The program office developed economic analyses to justify investment in the system in August 2002 and again in December 2003. The program office was supported in its efforts by the Office of the Deputy Assistant Secretary of the Army's Office of Cost and Economics and the Office of the Secretary of Defense's Office of Program Analysis and Evaluation, whose missions include verifying and validating the reliability of cost and benefit estimates found in Army and other services' economic analyses. However, this most recent economic analysis is not based on reliable estimates of life-cycle costs and benefits. Specifically, the analysis was based on the assumption that TC-AIMS II would be used by all four military services, and, thus, it included life-cycle cost estimates showing all of the services' data—as well as the benefits that would accrue through its use by all four. However, this assumption is not valid. Specifically, the Air Force's Assistant Deputy Chief of Staff, Installations and Logistics, informed the program office in a September 2002 correspondence that it would not use the system, stating that the Air Force would rely instead on its existing system capabilities. Similarly, in March 2004, the Marine Corps' Deputy Commandant for Installations and Logistics informed the program office that the Corps would not use the system because of concerns about whether the system would, among other things, deliver expected capabilities. Program officials told us that the latest economic analysis includes the costs and benefits for all services because, despite communications to the contrary from the Air Force and Marine Corps, the program office still considers TC-AIMS II to be a multiservice program and has not yet been directed to assume and plan otherwise.

In addition to the unreliable cost and benefit estimates, the latest analysis does not show a benefit-to-cost ratio that is greater than 1. Specifically, the analysis identified present value, total expected benefits of \$928 million

versus present value, and total estimated costs of \$929 million, for a benefit-to-cost ratio of slightly less than 1. This means that for each dollar spent on the system, slightly less than one dollar of benefit is returned. In addition, the analysis cited various qualitative benefits (e.g., increasing commander visibility of assets and enhancing worker productivity) that would be derived from the system. However, the analysis did not provide any underlying support or analysis for these qualitative benefits.

Program officials said that they recognize that the system's expected return on investment is marginal, but they nevertheless have been directed by the milestone decision authority—the Assistant Secretary for Defense, Networks and Information Integration—to deliver the system's capabilities as planned. According to the officials in the Assistant Secretary's office, the decision to continue investing in TC-AIMS II was based on quantitative and qualitative benefits, which they stated together exceeded costs, thus making the investment justified. However, these officials did not provide supporting justification for their qualitative benefit claims. In addition, their position does not recognize the intended change in the program's scope that is not reflected in the latest analysis. Thus, the Army lacks the basis for knowing whether its planned investment in TC-AIMS II is justified.

Investments Have Not Been Incrementally Justified

DOD policy and guidance, as well as other related federal and best practice guidance,⁶ state that large projects, such as TC-AIMS II, should be divided into a series of smaller, incremental subprojects or releases so that investment decisions can be made on each increment. By doing this, the tremendous risk associated with investing large sums of money over many years in anticipation of delivering system capabilities and associated expected business value far into the future can be spread across project increments that are smaller, of shorter duration, and capable of being more reliably justified and more effectively managed against cost, benefit, and risk expectations.

The Army has neither analyzed TC-AIMS II costs and benefits, nor made associated investment decisions, on an incremental basis. Specifically, while the program office divided the system's acquisition into five smaller increments (blocks), the economic analyses addressed life-cycle costs and benefits for the entire system. The analyses did not identify separately the

⁶See, for example, the Clinger-Cohen Act of 1996, 41 U.S.C. §§ 434, and Office of Management and Budget, Circular No. A-130, *Management of Federal Information Resources* (Nov. 30, 2000).

costs and benefits for each of the five increments, and, thus, this information was not considered as program officials made decisions about TC-AIMS II at key milestones. Program officials stated that they have not analyzed costs and benefits on an incremental basis because once the program had been approved and initiated, they did not see the need thereafter to justify each increment. By not determining the costs and benefits of each of the system's increments, the Army runs the risk of discovering too late (i.e., after it has invested hundreds of millions of dollars) that TC-AIMS II is not cost-beneficial.

TC-AIMS II Has Not Been Defined and Developed within the Context of a DOD Enterprise Architecture

DOD's acquisition policies and guidance,⁷ as well as federal and best practice guidance,⁸ recognize the importance of investing in IT business systems within the context of an enterprise architecture. Our research and experience in reviewing federal agencies show that not doing so often results in systems that are duplicative, are not well integrated, are unnecessarily costly to interface and maintain, and do not optimally support mission outcomes.⁹ TC-AIMS II has not been defined and

⁷DOD, Department of Defense Directive Number 5000.1 and Department of Defense Architecture Framework, Version 1.0, Volume 1 (February 2004).

⁸Clinger-Cohen Act of 1996, 40 U.S.C. §§ 11312 and 11315(b)(2); E-Government Act of 2002, Public Law 107-347 (Dec. 17, 2002); GAO, *Information Technology: A Framework for Assessing and Improving Enterprise Architecture Management (Version 1.1)*, [GAO-03-584G](#) (Washington, D.C.: April 2003); Chief Information Officer Council, *A Practical Guide to Federal Enterprise Architecture, Version 1.0* (February 2001); and Institute of Electrical and Electronics Engineers, *Standard for Recommended Practice for Architectural Description of Software-Intensive Systems 1471-2000* (Sept. 21, 2000).

⁹See, for example, GAO, *Information Technology: FBI Is Taking Steps to Develop an Enterprise Architecture, but much Remains to Be Accomplished*, [GAO-05-363](#) (Washington, D.C.: Sept. 9, 2005); *Homeland Security: Efforts Under Way to Develop Enterprise Architecture, but Much Work Remains*, [GAO-04-777](#) (Washington, D.C.: Aug. 6, 2004); *DOD Business Systems Modernization: Limited Progress in Development of Business Enterprise Architecture and Oversight of Information Technology Investments*, [GAO-04-731R](#) (Washington, D.C.: May 17, 2004); *Information Technology: Architecture Needed to Guide NASA's Financial Management Modernization*, [GAO-04-43](#) (Washington, D.C.: Nov. 21, 2003); *DOD Business Systems Modernization: Important Progress Made to Develop Business Enterprise Architecture, but Much Work Remains*, [GAO-03-1018](#) (Washington, D.C.: Sept. 19, 2003); *Business Systems Modernization: Summary of GAO's Assessment of the Department of Defense's Initial Business Enterprise Architecture*, [GAO-03-877R](#) (Washington, D.C.: July 7, 2003); *Information Technology: DLA Should Strengthen Business Systems Modernization Architecture and Investment Activities*, [GAO-01-631](#) (Washington, D.C.: June 29, 2001); and *Information Technology: INS Needs to Better Manage the Development of Its Enterprise Architecture*, [GAO/AIMD-00-212](#) (Washington, D.C.: Aug. 1, 2000).

Well-defined DOD Enterprise Architecture to Guide and Constrain TC-AIMS II Has Not Existed

developed in the context of a DOD enterprise architecture. Instead, the Army has pursued the system on the basis of an Army logistics-focused architecture. This means that TC-AIMS II as a DOD-wide program is based on a service-specific architecture and not a DOD-wide architecture, thus increasing the risk that TC-AIMS II, as defined, will not properly fit within the context of future DOD enterprisewide business operations and IT environments.

A well-defined enterprise architecture provides a clear and comprehensive picture of an entity, whether it is an organization (e.g., a federal department) or a functional or mission area that cuts across more than one organization (e.g., personnel management). This picture consists of snapshots of both the enterprise's current or "As Is" environment and its target or "To Be" environment, as well as a capital investment road map for transitioning from the current to the target environment. These snapshots consist of integrated "views," which are one or more architecture products that describe, for example, the enterprise's business processes and rules; information needs and flows among functions, supporting systems, services, and applications; and data and technical standards and structures.

DOD has long operated without a well-defined enterprise architecture for its business environment. In 2001, we first reported that DOD did not have such an architecture, and we recommended that it develop one to guide and constrain IT business systems, such as TC-AIMS II.¹⁰ Over the next 4 years, we have reported that DOD's architecture development efforts were not resulting in the kind of business enterprise architecture that could effectively guide and constrain business system investments,¹¹ largely because the department did not have in place the architecture management structures and processes described in federal guidance. In particular, we most recently reported in July 2005¹² that despite spending about \$318 million producing eight versions of its architecture, DOD's latest version still did not have, for example, a clearly defined purpose that could be

¹⁰GAO, *Information Technology: Architecture Needed to Guide Modernization of DOD's Financial Operations*, [GAO-01-525](#) (Washington, D.C.: May 17, 2001).

¹¹GAO, *DOD Business Systems Modernization: Improvements to Enterprise Architecture Development and Implementation Efforts Needed*, [GAO-03-458](#) (Washington, D.C.: Feb. 28, 2003); *Information Technology: Observations on Department of Defense's Draft Enterprise Architecture*, [GAO-03-571R](#) (Washington, D.C.: Mar. 28, 2003); [GAO-03-877R](#); [GAO-03-1018](#); and [GAO-04-731R](#).

¹²[GAO-05-702](#).

linked to the department's goals and objectives, and a description of the "As Is" environment and a transition plan. Further, we reported that the description of the "To Be" environment was still missing important content (depth and scope of operational and technical requirements) relative to, for example, the actual systems to be developed or acquired to support future business operations and the physical infrastructure (e.g., hardware and software) that would be needed to support the business systems. Over the last several years, we have also reported that DOD's efforts for determining whether ongoing investments were aligned to its evolving architecture were not documented and independently verifiable.¹³ On September 28, 2005, DOD's Under Secretary of Defense for Acquisition, Technology, and Logistics and Under Secretary for Defense (Comptroller) issued the next version of its business enterprise architecture,¹⁴ which we are required to review, along with other things, such as the department's efforts to review certain investments' alignment with the architecture, pursuant to the Fiscal Year 2005 National Defense Authorization Act.¹⁵

According to program officials, the system has not been assessed against DOD's business enterprise architecture because one has yet to be completed. Instead, as described in more detail below, program officials told us they have aligned TC-AIMS II with the Army's enterprise architecture for logistics. However, without a well-defined architecture that sets the DOD-wide context within which a DOD-wide system is to fit, and a firm understanding of the extent to which TC-AIMS II, as defined, fits within that context, the program office risks acquiring a system that does not meet DOD business needs and introduces redundancies and incompatibilities that require costly and time-consuming rework to fix.

Army Reports That TC-AIMS II Is Aligned with an Army-Specific Architecture

In the absence of a DOD-wide architecture, program officials told us they have developed the system in the context of the Army's enterprise architecture for logistics—the Single Army Logistical Enterprise, which is managed by the Army's Chief Information Officer. For example, in 2004,

¹³GAO, *DOD Business Systems Modernization: Billions Being Invested Without Adequate Oversight*, [GAO-05-381](#) (Washington, D.C.: Apr. 29, 2005).

¹⁴The Under Secretary of Defense for Acquisition, Technology, and Logistics and the Under Secretary of Defense (Comptroller) are responsible for overseeing the development of DOD's business enterprise architecture.

¹⁵Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Public Law 108-375, § 332, 118 Stat. 1811, 1851-1856 (Oct. 28, 2004) (codified in part at 10 U.S.C. § 2222).

program officials requested the Army's Chief Information Officer to determine whether TC-AIMS II was aligned with the logistic architecture. The Office of the Chief Information Officer conducted an analysis during the fall of 2004 that focused on, among other things, tracing TC-AIMS II business processes and requirements to those specified in the logistics architecture. The Chief Information Officer reported in March 2005 that TC-AIMS II, as defined in Blocks 1 to 3, was aligned with the logistics architecture. We did not review, and thus do not question, this analysis because TC-AIMS II is intended to be a joint system, and thus aligning it solely with the Army's logistics architecture will not provide the program with sufficient basis for managing the risk of not being able to adequately ensure that a DOD-wide system aligns with a DOD-wide architecture.

Risk Management Has Not Been Effectively Implemented

Effective risk management is vital to the success of any system acquisition. Accordingly, DOD acquisition management policies and guidance,¹⁶ as well as other relevant best practice guidance,¹⁷ advocate proactively identifying facts and circumstances that can increase the probability of an acquisition's failing to meet cost, schedule, and performance commitments and then taking steps to reduce the probability of their occurrence and impact. Effective risk management includes

- developing written policies and procedures;
- assigning roles and responsibilities for managing risk;
- developing a risk management plan that provides for (1) identifying and prioritizing risks, (2) developing and implementing the appropriate risk mitigation strategies, and (3) tracking and reporting on progress in implementing the strategies; and
- executing the plan.

¹⁶DOD, Department of Defense Instruction Number 5000.2.

¹⁷Software Engineering Institute, *Software Acquisition Capability Maturity Model® version 1.03*, CMU/SEI-2002-TR-010 (Pittsburgh, PA: March 2002).

To its credit, the program office has satisfied the first three of these four key practices. First, it has adopted and uses the risk policies and procedures specified in DOD's major IT systems acquisition guidance.¹⁸ Second, the program office has assigned risk management roles and responsibilities to the Government Risk Manager, who chairs the program's Risk Management Board. The board, which consists of key program managers and stakeholder representatives,¹⁹ is responsible for ensuring that the risk management program is implemented according to the risk management plan. Among other things, this includes assigning individuals who are to develop and implement risk mitigation plans for all newly identified risks. Third, the program office has a risk management plan, dated October 2004, and this plan provides for (1) identifying and prioritizing risks, (2) developing and implementing the appropriate mitigation strategies, and (3) tracking and reporting on progress in implementing the strategies. For example, the plan defines procedures for program staff and the board to follow in prioritizing risks, including assessing its "risk exposure" on the basis of a probability of occurrence and potential impact. On the basis of the assessment, "risk exposure" is designated as either high, medium, or low.²⁰ As of May 2005, the TC-AIMS II program office had identified 22 active risks in its risk inventory with the following exposures—1 high, 18 medium, and 3 low.

Fourth, since the program office has not fully implemented its risk management plan, it has not satisfied the fourth risk management practice—execution. For example, of the 22 active risks, 6 did not have mitigation strategies. Of these 6, 1 is high exposure and 5 are medium exposure risks. As another example, the program office's inventory does not include all key risks, such as the lack of reliable economic justification and alignment to a DOD-wide architecture as previously described in this report.

¹⁸DOD, Department of Defense Instruction Number 5000.2.

¹⁹The Risk Management Board consists of key program officials, including the deputy program manager, system development manager, operations manager, user support and deployment manager, performance assurance manager, and business manager as well as the contractor's program manager.

²⁰According to the risk plan, risk exposure is a function of a risk's projected impact and its probability of occurrence. It can be expressed as a relative function—the higher the level of exposure, the greater the risk to the program. Risk exposure is calculated by multiplying the impact by the probability of occurrence.

Program office officials stated that these risk management practices have not been fully implemented because of other competing priorities. Further, officials attributed the lack of risk mitigation strategies to staff turnover, which resulted in relatively few staff receiving training on how to use the automated tool employed by the office to document and track risks. In particular, program officials stated that only about 20 percent of the program staff (40 individuals) has attended the program's training on how to use the automated tool.

When we concluded our audit work, program officials acknowledged the missing risk mitigation strategies and stated that they are in the process of addressing them. Until the program fully implements effective risk management practices, there is increased probability that program risks will become actual problems leading to program cost, schedule, and performance shortfalls.

System Requirements Are Being Effectively Managed

DOD policy and guidance, as well as other relevant best practices,²¹ recognize the importance of effectively developing and managing system requirements. According to the policy and guidance, well-defined requirements are important because they establish agreement among the various stakeholders on what the system is to do, how well it is to do it, and how it is to interact with other systems. Having this agreement is key to acquiring a system that meets end-user needs and performs as intended.

Effective requirements development and management involve, among other things, (1) establishing a written policy on establishing and conducting requirements development and management activities; (2) eliciting desired and required system capabilities from users and translating them into system requirements; (3) documenting the requirements, including having users validate that they have been accurately captured; (4) ensuring that requirements changes are controlled as the system is developed and implemented; and (5) maintaining bidirectional traceability, meaning that a given requirement can be traced backward to its source and forward to both the component or increment that will satisfy the requirement and the test that will verify that it is satisfied.

²¹See, for example, DOD, Department of Defense Instruction Number 5000.2, and Software Engineering Institute, CMU/SEI-2002-TR-010.

The program office is managing TC-AIMS II requirements in accordance with these five practices. First, the program office adopted DOD Instruction 5000.2 and related guidance,²² as the program's policy for requirements development and management activities. The directive and guidance are also incorporated in program office plans that detail how the office develops and manages requirements during their life cycle—that is, from when requirements are first documented to when system responsibility is transferred to operations and maintenance support. According to program officials responsible for managing requirements, they use the guidance and plans to perform their work.

Second, program officials elicited required system capabilities from end users through the program's Joint Requirements Board, which consists of key system stakeholders and representatives and is chaired by the Joint Forces Command. The board is responsible for managing requirements development activities. Among other things, the board's charter states that its duties include defining, reviewing, validating, prioritizing, and approving the system's requirements. Board meeting minutes show evidence of it performing these duties, including, for example, reviewing the Block 3 baseline requirements document on September 8, 2004.

Third, program officials showed us how they document the requirements, using an automated tool. Further, the Joint Requirements Board approved the requirements baseline for each of the three blocks.

Fourth, to manage system requirement changes, the program office established a change control structure (configuration control board) and supporting processes, which are documented in its 2004 configuration management plan. Consistent with the plan, the board has six voting members and includes representatives from the four services. As shown in board meeting minutes and supporting documentation, the board meets monthly to consider and decide on change requests.

Fifth, the program maintains bidirectional traceability for the requirements using an automated tool.²³ Specifically, program officials demonstrated to us how each requirement can be traced back and to its source (e.g.,

²²DOD, Department of Defense Instruction Number 5000.2, and *Defense Acquisition Guidebook*, Version 1.0.

²³Dynamic Object Oriented Requirements System.

TC-AIMS II's operational requirements document) and forward to the block in which the requirement is to be satisfied.

Important Steps Have Been Taken to Effectively Leverage Commercial Components

The quality of the processes and practices followed in acquiring software-intensive systems greatly influences the quality of the systems produced. Moreover, acquiring custom-developed system solutions is sufficiently different from acquiring commercial component-based systems that adherence to certain practices unique to the latter is key to their success. As we have previously reported,²⁴ DOD's revised systems acquisition policies and guidance²⁵ require that commercial components be used to the maximum extent that is feasible. Collectively, they also provide for the following commercial component acquisition management best practices:

- modifying components only after a thorough analysis of life-cycle costs and benefits,
- ensuring that integration contractors are explicitly evaluated on their ability to implement commercial components, and
- ensuring that project plans provide for the time and resources needed to integrate commercial components with existing (legacy) systems.

The Army has largely complied with these practices for TC-AIMS II. First, program officials stated that it is their policy to discourage component modifications, which they have communicated in meetings and other program management directives. In addition, the program has established a joint configuration control board and supporting processes to limit and control changes to the commercial products being used. As stated in the program's configuration management plan (dated June 30, 2005), the board, which consists of key program managers and stakeholder representatives, only approves proposed changes to those products if the change is justified by a thorough analysis of costs, benefits, and risks. The board meets monthly to discuss and decide upon such changes, and, according to program officials, this approach has resulted in no major modifications to date.

²⁴GAO-04-722.

²⁵DOD, Department of Defense Instruction Number 5000.2.

Second, the program office evaluation of competing contractors included consideration of their ability to implement commercial components. For example, the TC-AIMS II request for proposal specified that the contractor's ability to implement commercial products was to be a significant factor in evaluating overall performance.

Third, the program's work breakdown schedule (dated Nov. 9, 2004) specifies the time and resources needed for integrating commercial components with existing systems.

By following these best practices associated with acquiring commercial-based systems, the program is increasing the likelihood that TC-AIMS II will be successfully implemented and effectively used.

Effective Contractor Management Practices Have Not Been Fully Employed

DOD policy and guidance and other relevant system acquisition management best practices recognize the importance of effectively managing contractor activities. To this end, policy and guidance call for, among other things, performing contractor tracking and oversight activities and using performance-based contracts to the maximum extent practicable. To its credit, the Army has performed key activities related to tracking and oversight. However, it has not fully implemented one key aspect of performance-based contracting. By not doing so, the program office has limited its ability to effectively influence contractor performance.

Effective Contractor Tracking and Oversight Practices Have Been Followed

Department policy and guidance and related best practices guidance²⁶ identify effective contractor tracking and oversight as a key contract management activity and define a number of associated practices to follow, including

- establishing a written policy on contract tracking and oversight;
- designating responsibility for contract tracking and oversight activities and having contracting specialists perform these activities; and

²⁶See, for example, DOD, Department of Defense Instruction Number 5000.2, and Software Engineering Institute, CMU/SEI-2002-TR-010.

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- using approved contractor planning documents as part of periodic reviews and interchanges with the contractor, during which actual cost and schedule performance is compared with the contractor's planned budgets and schedules to identify variances and issues.

The program office's tracking and oversight of the systems integration contractor from Block 3 largely satisfies these three practices. First, the program office has adopted the department's acquisition management polices and guidance as its written program-specific policy on contractor tracking and oversight.

Second, the program office assigned responsibility for contract tracking and oversight to its Budget Management Division, which has three staff devoted to these duties. The devoted staff are contracting specialists on detail from the General Services Administration's Federal Systems Integration and Management Center.

Third, the program office uses approved contractor planning documents as the basis for overseeing the contractor. These planning documents are specified in the contract and include a program management plan, a master project schedule, and program status reports. Collectively, these documents delineate when and how products and services are to be delivered. According to program officials, these planning documents are used during monthly status meetings with the contractor to track progress. In particular, they are used to compare actual cost and schedule performance to date with planned budgets and schedules to identify potential variances.

Program officials attribute the state of their contract tracking and oversight capability to two factors. First, the program has been in existence for about 10 years, thus allowing time for the office to develop disciplined processes in this area. Second, in hiring the Federal Systems Integration and Management Center contract specialists, the program has subject matter experts who know the importance of, and who actively advocate, rigorously following the processes. By employing key contract tracking and oversight practices, the program office is increasing the likelihood that the contractor will perform as expected.

Performance-Based Contracting Approach Is Not Fully Consistent with Policy and Best Practices

Department policy, federal acquisition regulations, and other relevant best practices²⁷ also advocate the use of performance-based contracting when acquiring services. Effective performance-based contracting includes

- defining clearly the work to be performed,
- specifying performance standards (quality and timeliness) that are tied to contractual requirements,
- establishing positive and negative incentives that are tied to the contractor's performance, and
- having a quality assurance plan that describes how the contractor's performance in meeting requirements will be measured against standards.

The program office's approach to managing the contract is largely consistent with these four practices. First, the contract for Block 3 (dated Apr. 30, 2004) includes a statement of objectives that define the work to be performed. For example, the contract identifies specific project tasks (e.g., establishing a Block 3 development help desk for system users) and associated project management products (e.g., program management plan, program schedule, and program status reports) that the contractor is to perform and deliver, respectively, in accordance with the contract.

Second, the contract includes performance standards (measures) that are contractually required. For example, it states that the help desk is to be staffed 24 hours per day, 7 days a week, with help operators capable of resolving 80 percent of user calls within 1 hour, while limiting caller on-hold time to 3 minutes or less.

Third, the contract provides positive incentives that are tied to contractor performance. That is, in addition to the base contract (cost plus fixed fee) amount, the contract includes an additional 8 percent fee that can be awarded to the contractor for satisfying specified performance criteria.

²⁷See, for example, Federal Acquisition Regulation, section 37.102(a); DOD, Department of Defense Directive Number 5000.1; and Software Engineering Institute, CMU/SEI-2002-TR-010.

Fourth, the latest quality assurance plan, dated August 2004, describes how the contractor's performance will be measured and what remedial steps are to be taken in case the contractor does not meet contractual requirements.

However, the contract does not specify effective disincentives or penalties for failing to meet the performance criteria. More precisely, the contract does not provide for forfeiting all or part of the fee if the contractor fails to perform as expected. Instead, program officials stated that their practice of withholding the additional award fee when expectations are not met, constitutes a disincentive. For example, they said that they withheld the award fee for the contractor's first performance period (which totaled about \$900,000) because the contractor failed to develop two deliverables on time (the program management plan and the performance metrics).

We do not agree that this practice constitutes an effective negative incentive because it does not penalize performance that fails to meet expectations. Moreover, program officials told us that in the above example, withholding the award fee was not a forfeiture, because it was actually deferred to the second performance period when the contractor had another opportunity to earn it. According to program officials, during the second performance period, the contractor earned almost \$780,000 of the withheld fee from the first period by completing, among other things, first period tasks.

In the absence of specific negative incentives that are tied to intended performance, the program is at increased risk of contractor nonperformance. This practice puts the program at risk of taking more time and spending more money than necessary to acquire contract deliverables and services.

Conclusions

It is unclear whether the Army's planned investment in TC-AIMS II is warranted. Of critical concern is the absence of reliable analysis showing that further investment will produce future mission benefits commensurate with estimated costs. This is due in large part to the evident change in the scope of the program, which was initiated on the basis of the four military services using TC-AIMS II but has not been revised to reflect that two services have stated their intentions not to use the system. Compounding this uncertainty is the inherent risk of defining and developing this multiservice system outside the context of a well-defined DOD-wide enterprise architecture. Without this information, the Army cannot currently determine whether TC-AIMS II, as defined and as being

developed, is the right solution to meet its strategic business and technological needs.

If these uncertainties are addressed and the Army demonstrates that TC-AIMS II plans are the right course of action, the department largely has the capabilities that are essential to successful system acquisition and deployment, although there is room for strengthening its practices related to risk management and performance-based contracting.

It is vital that Army and DOD authorities responsible and accountable for ensuring prudent use of limited resources first reassess whether allowing TC-AIMS II to continue as planned is warranted, and that the decision on how to proceed be based on reliable data about program costs, benefits, risk, and status.

Recommendations for Executive Action

We recommend that the Secretary of Defense direct the Secretary of the Army to determine if continued investment in TC-AIMS II as planned represents a prudent use of the department's limited resources. To accomplish this, the Secretary of the Army should take the following three actions:

- collaborate with the Office of the Assistant Secretary of Defense for Networks and Information Integration/Chief Information Officer, the Office of Program Analysis and Evaluation, and the Army Cost Analysis Division to prepare a reliable economic analysis;
- ensure that development of this economic analysis (1) complies with cost-estimating best practices and relevant Office of Management and Budget cost benefit guidance, (2) incorporates available data on whether deployed TC-AIMS II capabilities are actually producing benefits, and (3) addresses that the Air Force and Marines are not planning to use the system; and
- collaborate with the Undersecretary of Defense for Acquisition, Technology, and Logistics and the Under Secretary of Defense (Comptroller) to ensure that TC-AIMS II is adequately aligned with the evolving DOD business enterprise architecture.

In addition, we recommend that the Secretary of Defense direct the Secretary of the Army to present the results of these analyses to the Deputy Secretary of Defense, or his designee, and seek a departmental decision on

how best to proceed with the program. Until this is done, we recommend that the Secretary of Defense direct the Secretary of the Army to limit future investment in already deployed applications to essential operation and maintenance activities and only developmental activities deemed essential to national security needs.

If—on the basis of reliable data—a decision is made to further develop TC-AIMS II, we recommend that the Secretary of Defense direct the Secretary of the Army to ensure that the program implements effective program management activities related to risk management and performance-based contracting.

Agency Comments and Our Evaluation

In its written comments on our draft report, signed by the Deputy to the Assistant Secretary of Defense for Networks and Information Integration (Command, Control, Communications, Intelligence, Surveillance, and Reconnaissance and Information Technology Acquisition) and reprinted in appendix III, DOD either agreed or partially agreed with our recommendations, and it stated that some of our findings have merit and that it has significant efforts ongoing to comply with applicable guidance. For example, while DOD agreed that TC-AIMS II was originally defined and implemented without a complete and formal enterprise architecture and that the program had not identified the lack of a mature architecture as a program risk, it stated that the program is taking steps to ensure alignment to relevant enterprise architectures and is thereby mitigating this risk. In addition, although the department agreed that the latest economic analysis shows a negative return on investment, it said that other intangible benefits not included in the analysis, such as improved planning and equipment tracking, bolster the value of TC-AIMS II. Further, it agreed that the system was originally envisioned as a single DOD-wide solution and that the Air Force and Marine Corps are no longer intending to use the system, but added that it was now evaluating whether these two services' existing (legacy) systems should be enabled to share data with TC-AIMS II, rather than be replaced in their entirety by a joint system as was originally envisioned. According to DOD, the results of this evaluation are to be considered at the next milestone review, which is planned for early to mid-2006.

These comments are largely consistent with our report. Specifically, the report makes clear that DOD is managing TC-AIMS II in accordance with some key practices and has efforts under way, such as those previously cited, intended to bring the program into compliance with other key

practices. However, the report also points out noncompliance in areas intended to provide sufficient information to determine how the TC-AIMS II program should proceed. Accordingly, it contains recommendations to ensure that the economic analysis is updated to (among other things) reflect current operating assumptions, and that the program is adequately aligned with the department's evolving enterprise architectures. It is precisely because the program does not have this information that, despite having invested \$751 million over 11 years, the department does not know whether the program as defined is the right solution to meet DOD-wide asset deployment needs.

DOD offered five detailed comments on our four recommendations. The department's comments and our responses are as follow:

1. DOD stated that the TC-AIMS II program has used best practices and followed all economic analysis requirements specified in relevant DOD and OMB guidance, and has successfully passed milestone reviews at which it was required to show costs and benefits for both the entire system and its increments. In addition, the department stated that even though its economic analysis showed a slight negative return on investment, the system's intangible benefits bolster the program's overall value. According to DOD, the program identified these intangible benefits to obtain department milestone approval, and this documentation was provided to us on October 31, 2005. This notwithstanding, the department stated the program will (1) conduct, in coordination with the Office of the Secretary of Defense's Program Analysis and Evaluation, an analysis to determine the relationship of TC-AIMS II and other programs, such as the Global Combat Support System, that may provide similar functionality to ensure optimal return on investment and (2) brief the Networks and Information Integration Overarching Integrated Product Team in preparation for the next major milestone decision review. It also stated that these results will be used to justify further investment.

We do not agree that the program has used all best practices and followed all requirements specified in relevant guidance. In particular, the Army did not economically justify its TC-AIMS II investment on the basis of reliable estimates of costs and benefits and did not invest in TC-AIMS II within the context of a well-defined architecture, both of which are recognized best practices as well as DOD and OMB requirements. In addition, while it is appropriate to consider intangible benefits in economically justifying an investment, these benefits are not

in the economic analysis, and the separate document provided on October 31, 2005, did not contain sufficient rationale and justification for claimed qualitative benefits. Rather, the information provided was a restatement of the quantitative benefits in the economic analysis. Further, by stating that it is to conduct an analysis of the relationships of TC-AIMS II to other programs that provide similar functionality and use the results of this analysis to justify further system development, DOD is recognizing that it does not have the information it needs to make informed investment decisions. If done thoroughly, the analysis, which the department committed to conduct, should help to inform future program decisions.

2. Consistent with our report, DOD stated that TC-AIMS II was established as a joint military service program. However, in explaining why the Air Force and Marine Corps are not intending to use TC-AIMS II, it added that changes to operations throughout the world since then have necessitated changes to the services' deployment processes. In light of this, the department stated it will evaluate other options for data exchange among Air Force and Marine Corps existing asset deployment systems and TC-AIMS II, instead of having all the services use a single, joint system. Further, the department said it will have the program, in coordination with Program Analysis and Evaluation, develop an economic analysis for TC-AIMS II that is based on the system being used solely by the Army and the Navy. DOD also commented that our report assumed a positive cost-benefit impact from including the Air Force and Marine Corps in the program.

We support the department's decision to develop an economic analysis that reflects this material change in the program's scope, which is what we recommended. However, we would note that DOD's comments do not explain how unspecified changes to operations throughout the world caused unspecified changes to each of the services' deployment processes, which in turn required DOD to have to interface multiple service-unique systems, rather than adopting a joint system. We would expect such an explanation to be an integral part of updating the economic analysis, as will the costs of pursuing service-unique courses of action.

With regard to the comment that we assumed the inclusion of the Air Force and Marine Corps would have a positive cost-benefit impact, we do not agree. We made no assumption about the impact of the program's scope on the cost-to-benefit or return on investment ratios.

Rather, our point is that DOD policy and related guidance state that programs should be economically justified by, among other things, cost and benefit estimates that are based on realistic plans for the program's scope. Such realistic plans did not exist because DOD's justification was based on the four services using the system, when in reality the Air Force and Marine Corps do not intend to do so. Relevant guidance calls for updating economic analyses when significant program changes such as these occur. Accordingly, we recommended that the department follow this guidance to ensure it had adequate information for informed decision making.

3. DOD commented that it has worked over the past several years to develop an enterprise architecture and is on a path to fully defining and effectively managing its enterprise architecture. It also said that it is working to align TC-AIMS II with relevant evolving architectures. In particular, DOD stated that Blocks 1 through 4 are aligned with the Joint Deployment Operational Architecture and the program office continues to work to align the program with the Joint Deployment and Distribution Architecture, which it said is currently aligning to the evolving Business Enterprise Architecture.

We do not take issue with the comments that work has been and is under way in this area. Our point is that the Business Enterprise Architecture is still a work in progress and what has been available to guide and constrain business system investments, such as TC-AIMS II, has not been sufficient. Moreover, program officials told us that TC-AIMS II has not been assessed against the Business Enterprise Architecture because this architecture has not yet been completed. Without a well-defined DOD-wide architecture that sets the context within which such a joint military service system is to fit, and a firm understanding of the extent to which TC-AIMS II, as defined, fits within that context, the program office risks, among other things, acquiring a system that does not meet DOD's strategic business needs.

4. DOD stated that while comprehensive mitigation and contingency strategies were not developed for all of the 22 risks cited in our report, the program office has subsequently developed strategies for them. DOD also commented that subsequent risk management data, along with evidence that risks are continuously reviewed and updated, was provided to us on October 28 and November 3, 2005.

We acknowledge that program officials orally stated that this had occurred. However, we have yet to receive any documentation to substantiate these statements.

5. DOD stated that while the current TC-AIMS II contract does not include direct disincentives for contractor failure to meet performance criteria, its semiannual award fee mechanism serves a similar purpose. Nonetheless, DOD commented that it will address its award fee implementation on future TC-AIMS II contract reviews.

We do not agree that this semiannual award fee approach is an effective disincentive because award fees are only being withheld when contractor performance does not exceed certain targets; conversely, direct disincentives penalize poor performance that falls short of meeting contractually required levels of performance. Without direct disincentives, the program is at increased risk of contractor nonperformance, and thus taking more time and spending more money than necessary to acquire contract deliverables and services. We support the department's stated commitment to address this issue.

We are sending copies of this report to interested congressional committees. We are also sending copies to the Director, Office of Management and Budget; the Secretary of Defense; the Deputy Secretary of Defense; the Undersecretary of Defense for Acquisition, Technology, and Logistics; the Assistant Secretary of Defense (Networks and Information Integration)/Chief Information Officer; the Secretaries of the Air Force, Army, and Navy; the Commandant of the Marine Corps; the Department of the Army's Chief Information Officer; and the Program Executive Officer, Enterprise Information Systems, Transportation Information Systems, Department of the Army. We are also sending copies to other interested parties. This report will also be available at no charge on our Web site at <http://www.gao.gov>.

Should you have any questions about matters discussed in this report, please contact me at (202) 512-3439 or hiter@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on

the last page of this report. A GAO contact and staff who made major contributions to this report are listed in appendix IV.

A handwritten signature in black ink, reading "Randolph C. Hite". The signature is written in a cursive style with a large initial "R" and "H".

Randolph C. Hite
Director, Information Technology Architecture
and Systems Issues

Objective, Scope, and Methodology

Our objective was to determine whether the Transportation Coordinators' Automated Information for Movements System II (TC-AIMS II) was being managed according to important aspects of the Department of Defense's (DOD) acquisition policies and guidance, as well as other relevant acquisition management best practices. To accomplish this, we focused on the program's (1) economic justification; (2) architectural alignment; (3) risk management; (4) requirements development and management; (5) commercial components; and (6) contract management, including contractor oversight and performance-based contracting.

To determine whether the Department of the Army had economically justified its investment in TC-AIMS II, we reviewed the latest economic analysis to determine the basis for the cost and benefit estimates and net present value calculations. This included evaluating the analysis against DOD policies and guidance¹ as well as other relevant best practices guidance.² It also included interviewing responsible program officials, including the program and deputy program managers, regarding their respective roles, responsibilities, and actual efforts in developing and/or reviewing the economic analysis. In addition, we also interviewed the program and deputy program manager and the Office of the Assistant Secretary of Defense for Network Information and Integration about the purpose and use of the analysis for managing the Army's investment in the TC-AIMS II program, including the extent to which measures and metrics showed that benefits projected in the economic analysis were actually being realized.

¹These policies and guidance included DOD, Department of Defense Directive Number 5000.1, *The Defense Acquisition System* (May 12, 2003); Department of Defense Instruction Number 5000.2, *Operation of the Defense Acquisition System* (May 12, 2003); and *Defense Acquisition Guidebook*, Version 1.0 (Oct. 17, 2004).

²See, for example, Office of Management and Budget, Circular No. A-94: *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (Oct. 29, 1992); and GAO, *Information Technology: DOD's Acquisition Policies and Guidance Need to Incorporate Additional Best Practices and Controls*, [GAO-04-722](#) (Washington, D.C.: July 30, 2004).

To determine whether the Army had aligned TC-AIMS II to the DOD business enterprise architecture,³ we relied on our prior reports addressing DOD and Army architecture development and implementation efforts and documents on the Army's efforts to align TC-AIMS II with its logistics architecture (the Single Army Logistics Enterprise), as well as documents on the Army's efforts to align the logistics architecture with DOD's business enterprise architecture. We also interviewed officials from the TC-AIMS II joint program management office, the Office of the Assistant Secretary of Defense for Networks and Information Integration/Chief Information Officer, and the Office of the Army's Chief Information Officer about DOD and Army architecture efforts and TC-AIMS II's alignment to them.

To determine whether the Army was effectively managing key system acquisition activities, namely risk management, requirements development and management, commercial components, and contract management, we did the following:

- To assess risk management, we reviewed the program's risk policies, processes, management plan, and related documentation. We also observed how the program used an automated tool (database) to document and track risks, including developing risk mitigation strategies. In addition, we analyzed a version of the database to determine, among other things, the state of risk mitigation strategies. We then compared these activities with DOD policy, guidance, and related best practices to determine whether variances existed, and if so, why. Moreover, we interviewed Army officials involved with risk management, including the program manager and risk manager, to discuss their roles and responsibilities for managing risk associated with acquiring and implementing TC-AIMS II.

³GAO, *DOD Business Systems Modernization, Long-standing Weaknesses in Enterprise Architecture Development Need to Be Addressed*, [GAO-05-702](#) (Washington, D.C.: July 22, 2005); *Information Technology: Enterprise Architecture Use across the Federal Government Can Be Improved*, [GAO-02-6](#) (Washington, D.C.: Feb. 19, 2002); and *Information Technology: Leadership Remains Key to Agencies Making Progress on Enterprise Architecture Efforts*, [GAO-04-40](#) (Washington, D.C.: Nov. 17, 2003).

- To assess requirements development and management capabilities, we reviewed program documentation, such as the official list of requirements, and system specifications and evaluated them against these relevant best practices⁴ for several characteristics, including traceability and prioritization. We observed program office staff trace requirements to both higher level documents and lower level specifications using an automated tool. We interviewed Army officials involved in the requirements development process, including the program and deputy program managers, to discuss their roles and responsibilities for developing and managing requirements.
- To evaluate the management of commercial components, we reviewed a variety of documents, such as program and contractor studies of commercial components' products, as well as the program office's project plans, and contract task order documentation. Additionally, we conducted interviews with the program officials, including the program and deputy program managers, responsible for selecting the commercial components for planned TC-AIMS II blocks, to determine whether the commercial component products had been acquired in accordance with DOD policy, guidance, and related best practices.
- To assess contract management, we focused on the program office's contract tracking and oversight activities as well as its use of performance-based contracting. For tracking and oversight, we reviewed program management plans, contractor monthly status reports, and related documentation of the program office's policies, processes, and activities for overseeing its system integration contractor for Block 3. We then compared these with DOD policies, guidance, and related best practices. We also interviewed program offices responsible for managing these activities. For performance-based contracting, we reviewed the Block 3 contract (issued in April 2004) and related documentation, such as contract modifications, quality assurance plan, and reports on determining contractor award fee, and then compared them with department policy and guidance, federal acquisition regulations, and related best practices. We also interviewed program management officials, including the contract specialist from the General Service Administration's Federal Systems Integration and Management Center, who are responsible for performing these activities.

⁴Software Engineering Institute, *Software Acquisition Capability Maturity Model® version 1.03*, CMU/SEI-2002-TR-010 (Pittsburgh, PA: March 2002).

Appendix I
Objective, Scope, and Methodology

We did not independently validate information on the program's cost and budget as well as the number of problem reports.

We conducted our work at DOD headquarters in the Washington, D.C., metropolitan area and at the Army's Joint Program Management Office in Northern Virginia. We performed our work from October 2004 through October 2005, in accordance with generally accepted government auditing standards.

Assessment of Problem Reports

One indicator of system quality is defect density, which can be measured in a number of ways, including the trend in the number of system defects being reported and resolved. The program office prepares problem reports to document and prioritize system defects, and it established a database to manage and track these reports. Further, the program office assigns priority (i.e., criticality) levels to problem reports, with category 1 being the most critical, and category 5 being the least critical. The program office's definition of each category is as follows:

Category 1: The system or function does not work and the problem must be addressed immediately, before any further work can be completed.

Category 2: The system or function may work, but the problem is severe and must be addressed before the end of the current block.

Category 3: Essentially, this is a category 2 problem with a known solution that would provide a temporary fix.

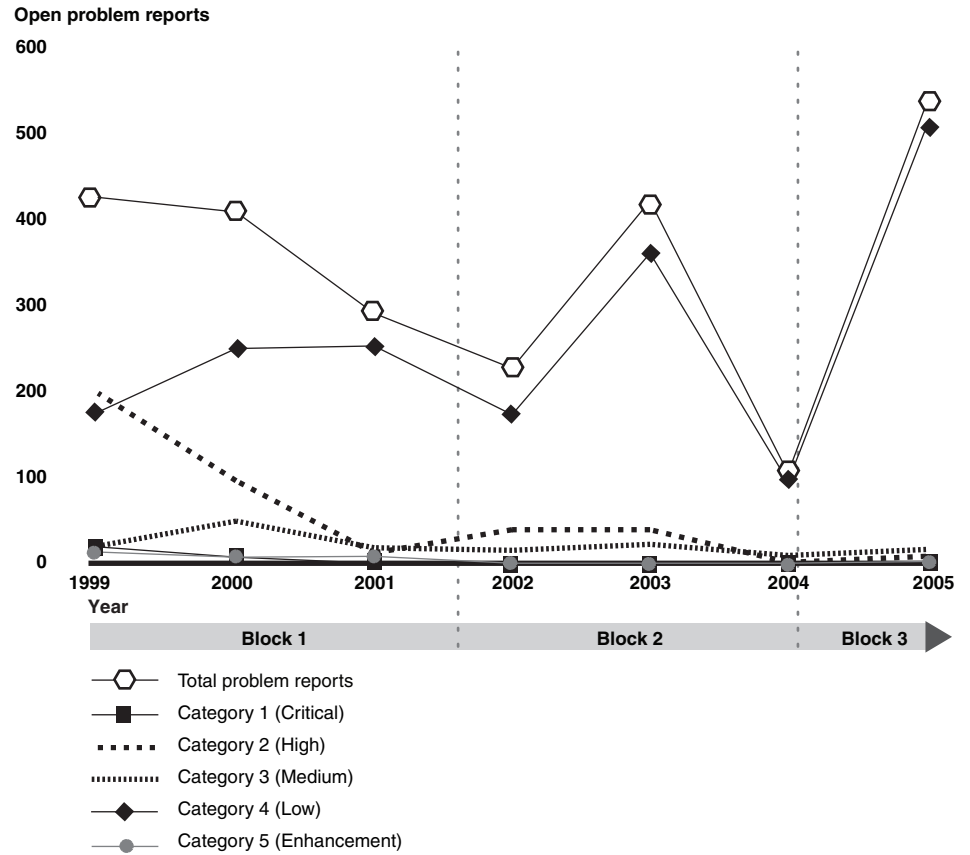
Category 4: A routine problem that does not pose a significant threat and thus no immediate action is required.

Category 5: A minor problem that does not pose a significant threat to system functionality.

As depicted in figure 2, the data show that the number of open (yet to be resolved) problem reports over the first two development blocks has decreased. In particular, the total number of open problem reports has decreased by 321 (or 75 percent), from 426 in fiscal year 1999 to 105 at the end of fiscal year 2004. During the same period, categories 1 and 2 problem reports decreased by 216 (or about 100 percent), from 217 to 1. This downward trend reversed for the less critical defects in fiscal year 2005. Specifically, as of September 30, 2005, there were 534 total defects, 25 of which were categories 1, 2, and 3. Program officials attributed this reversal of categories 4 and 5 defects to current Block 3 testing activities and stated that they anticipated the increase and are actively managing it. In addition, they stated that while overall defects have recently increased, the number of critical defects has increased only slightly, and program staff are working to resolve these increases, with the goal of having permanent solutions implemented before Block 3 is deployed, which is scheduled to begin in October 2006.

Appendix II
Assessment of Problem Reports

Figure 2: Number of Problem Reports, Fiscal Years 1999 through 2005



Source: GAO analysis of DOD data.

Comments from the Department of Defense



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DEC 06 2005

NETWORKS AND INFORMATION
INTEGRATION

Mr. Randolph C. Hite
Director, Information Technology Architecture and Systems Issues
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Hite:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-06-171, "DOD SYSTEMS MODERNIZATION: Uncertain Joint Use and Marginal Expected Value of Military Asset Deployment System Warrant Reassessment of Planned Investment," dated November 15, 2005 (GAO Code 310295).

We appreciate the opportunity to comment on the draft report and the time your staff afforded us during their preparation of the report.

The Transportation Coordinators' - Automated Information for Movements System II (TC-AIMS II) is an Acquisition Category 1AM program. It was established as a Joint Program in 1999. The lead service is the United States Army. Program oversight is the responsibility of the Assistant Secretary of Defense, Networks and Information Integration. An oversight process is being followed that includes an Overarching Integrated Product Team chaired by the undersigned. Day-to-day management of the program falls within the authority of the Army Program Executive Officer for Enterprise Information Systems, (PEO EIS).

The Army, as lead service, provided significant analysis and comment regarding the report. While our response recognizes that some of the report's findings have merit, we point out significant effort that is ongoing to comply with applicable guidance and direction. Although TC-AIMS II was originally defined and implemented without complete and formal enterprise architecture design, the Army Program Management Office has made an extraordinary effort to ensure maximum alignment to the DoD Business Enterprise and various secondary architectures. Further, while the strict economic analysis shows a slight negative return, improved planning and equipment tracking, which are command and control benefits, bolster the value of TC-AIMS II to the Army and Navy. Finally, while the TC-AIMS II was originally envisioned as the single solution, the Joint Forces Command (JFCOM) and the Joint Staff J4 is now reviewing this concept. Given the significant investment by the Air Force and the Marine Corps in




Appendix III
Comments from the Department of Defense

their legacy deployment systems and the unique deployment processes that exist, JFCOM is investigating if the various deployment systems can be joined electronically through a data centric approach versus single system centric. The results of JFCOM's and J4's investigation will be reviewed by the OIPT as a part of the next milestone review.

Rather than provide detailed comments on the report's findings, we chose to focus our response on the report's recommendations. Our reply to each recommendation is enclosed. Our point of contact is Dean Carsello at 703-602-2720, ext 116.

Sincerely,


John R. Landon
Deputy to the ASD(NII)
(C3ISR & IT Acquisition)

Enclosure:
As stated

GAO DRAFT REPORT DATED NOVEMBER 15, 2005
GAO-06-171 (GAO CODES 310295)

"DOD SYSTEMS MODERNIZATION: UNCERTAIN JOINT USE
AND MARGINAL EXPECTED VALUE OF MILITARY ASSET
DEPLOYMENT SYSTEM WARRANT REASSESSMENT OF
PLANNED INVESTMENT"

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATION

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to collaborate with the Office of the Assistant Secretary of Defense for Networks and Information Integration/Chief Information Officer, the Office of Program Analysis and Evaluation (PA&E), and the Army Cost Analysis Division to prepare a reliable economic analysis. (p. 28/GAO Draft Report)

DoD RESPONSE: Partially Concur.

The GAO recommendation is based on findings that

"investment in TC-AIMS II has not been adequately justified on the basis of costs and benefits" (Page 11) and "The Army has not analyzed TC-AIMS II cost and benefits, and made associated investment decisions, on an incremental basis." (Page 13).

The TC-AIMS II Program has followed all requirements for the development of an Economic Analysis (EA) defined by DoD Instruction (DoDI) 5000.2 and OMB Circular A-94. As prescribed by DoDI 5000.2, Army-level and Office of Secretary of Defense (OSD)-level reviews have been conducted at least twice for each incrementally developed block of capability. These reviews included an EA for the specific Block under review as well as a review of the overall program. At each milestone review, the TC-AIMS II program office is required to show costs and benefits at the system and incremental Block level. EA reviews by the Office of the Deputy Assistant Secretary of the Army (Cost and Economics) (ODASA-CE) and PA&E ensure that the EA is prepared in accordance with cost estimating best practices and relevant Office of Management and Budget (OMB) cost benefit guidance.

Appendix III
Comments from the Department of Defense

After review of the Army's initial EA for TC-AIMS II, PA&E requested additional support for the intangible benefits that the Army's EA assumed would accrue. This documented rationale was provided to GAO in response to the out brief results on 31 October, 2005.

The rationale provided to PA&E demonstrated the potential cost savings resulting from better inventory tracking and control generated from developing TC-AIMS II Block 3. This rationale resulted in PA&E endorsing MS B approval for Block 3. Additionally, TC-AIMS II provides benefits directly to a war fighting mission. For example, TC-AIMS II will provide improved tracking that will help locate missing critical items such as ammunition. Strict economics cannot necessarily offset this intangible opportunity cost benefit.

Notwithstanding, we will direct the Army to (1) conduct, in coordination with PA&E, an analysis to determine the relationship of TC-AIMS II, the Army's Global Combat Support System and other programs that may provide similar functionality to ensure optimal return on investment and (2) brief the Networks and Information Integration (NII) Overarching Integrated Product Team in preparation for the Block 4 MS B milestone decision review. The results will be used to justify further development.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to ensure that development of this economic analysis: (1) complies with cost estimating best practices and relevant OMB cost benefit guidance; (2) incorporates available data on whether deployed Transportation Coordinators Automated Information for Management System II capabilities are actually producing benefits; and (3) addresses that the Air Force and Marines are not planning to use the system. (p. 28/GAO Draft Report)

DoD RESPONSE: Partially Concur.

The GAO recommendation is based on a finding that

"The Army has not economically justified its investment in TC-AIMS II on the basis of reliable estimates of costs and benefits. The most recent economic justification included cost and benefit estimates predicated on all four military services using the system. However, two services (Air Force and Marines) have stated that they do not intend to use it. Even with costs and benefits for all four services included, the analysis showed a marginal return on investment; that is, for each dollar spent on the system, slightly less than one dollar of benefit would be returned."
(Page 2)

TC-AIMS II was established as a joint program involving the participation of all Services (Army, Navy, Air Force, and Marine Corps) by the Joint Requirements Oversight

Counsel (JROC) on March 25, 1999. However, changes to operations throughout the world have necessitated changes to each of the Services' deployment processes. JFCOM initiated a study, at the direction of the Milestone Decision Authority, to determine whether or not a single solution is still viable. The Air Force and Marine Corps have invested into legacy programs that match their unique processes. To accommodate unique processes, improvements in technology have enabled focusing on a data centric versus a single system centric approach. The Deputy Director for Strategic Logistics, Joint Chief of Staff – J4, has initiated an effort to provide interoperability among several force movement systems, including TC-AIMS II. This effort will compensate for the mission-unique capabilities that precluded the Air Force and Marine Corps from adopting TC-AIMS II if the Department determines TC-AIMS II will not be the joint system solution for force movement.

As such, we will direct that the Army, in coordination with PA&E, develop an EA that includes Army and Navy use only as an option. This EA information will be used in combination with the analysis that determines whether the Department implements a data centric approach and if further investment into TC-AIMS II is justified. It should be noted that the GAO comment regarding the inclusion of Air Force and Marine Corps factors in the economic analysis assumes a positive impact on TC-AIMS II benefit-to-cost and return on investment ratios. This is not necessarily the case. The most recent EA for TC-AIMS II appears to show that the ROI may actually improve if the Department implements an Army and Navy only program. The EA continues to be refined in preparation for the next milestone scheduled next summer.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to collaborate with the Under Secretary of Defense (Acquisition, Technology, and Logistics) and the Under Secretary of Defense (Comptroller) to ensure that TC-AIMS II is adequately aligned with the evolving DoD Business Enterprise Architecture. (p. 28/GAO Draft Report)

DoD RESPONSE: Partially concur.

The GAO recommendation is based on a finding that

"TC-AIMS II has not been defined and developed in the context of a DoD enterprise architecture. Instead, the Army has pursued the system based on an Army logistics-focused architecture. This means that TC-AIMS II as a DoD-wide program is based on a service-specific architecture and not a DoD-wide architecture, thus increasing the risk that TC-AIMS II, as defined, will not properly fit within the context of future DoD enterprise-wide business operations and IT environments.... DoD has long operated without a well defined enterprise architecture for its business environment." (Pages 14-15)

The Department has worked over the past several years to develop a comprehensive enterprise architecture and management structure. The implementation of domain owners and portfolio management tied to investment as outlined in DoD Directive 8115.01 signed 10 October 2005 will place the Department on a path to fully defining and effectively managing its enterprise architecture. TC- AIMS II was initiated before the Department's formulation of a net-centric strategy. The program crosses over both the Deployment and Distribution Enterprises. The Program Management Office is working to ensure alignment to these evolving enterprise architectures. Blocks 1 through 4 align with the Joint Forces Command (JFCOM) Joint Deployment System (JDS) Joint Deployment Operational Architecture (JDOA) and that alignment is demonstrated in the DoD Architecture Framework (DoDAF) operational and system view products provided with system documentation. Additionally, the Program Management Office continues to work with the Distribution Process Owner (DPO), United States Transportation Command (USTRANSCOM), to align the program architecture to the Joint Deployment and Distribution Architecture, which is currently aligning to the evolving DoD Business Enterprise Architecture (BEA).

RECOMMENDATION 4: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to present the result of the analysis outlined in Recommendation 1 to the Deputy Secretary of Defense, or his designee, and seek a departmental decision on how best to proceed with the program. Until this is done, the GAO recommended that the Secretary of Defense direct the Secretary of the Army to limit future investment in already deployed applications to essential operation and maintenance activities and only developmental activities deemed essential to national security needs. (p. 28/GAO Draft Report)

DoD RESPONSE: Concur.

The Department procedures require each block of new capability to undergo a milestone review. Prior to entering Block 4 development, the Milestone Decision Authority (MDA) must assess the economic benefit of the investment. The Department's Investment Review Board assesses compliance with the BEA and certifies program investment strategies annually. The Department makes programmatic decisions throughout the development life cycle of the program. Based on a number of factors to include the economic analysis, the Department makes a determination for each Block to begin development, to assess readiness to enter operational testing and to determine if the capability should be fielded. The Block 3 development is virtually complete. Prior to entering its operational testing, the MDA has directed the Army conduct a review of the status of the program. Further, prior to final fielding, the program the MDA will conduct the Full Rate Production Decision Review including compliance with Title 40 requirements. Finally, as stated above, prior to initiating Block 4 development, the program must demonstrate its capability to satisfy requirements including its overall return on investment.

TC-AIMS II was originally envisioned as the Department's single system solution for force movement. However, technology advancement and changes to deployment processes in response to the changing global security environment have necessitated and facilitated a data centric approach to meeting the needs of the war fighter. In addition to the JFCOM initiative stated above, The Assistant Deputy Under Secretary of Defense for Transportation Policy and the Joint Staff J4, in collaboration with DoD Components, and other OSD staff, are coordinating efforts for the DPO to perform a mission requirements analysis for future investment into TC-AIMS II. The process has just begun. This analysis will support advancement of the data centric approach if the Department decides to follow that course of action. Prior to any additional investment into TC-AIMS II development, the MDA through the OIPT will reassess the program considering the milestone requirements, the Joint Deployment Process Owner study, and the DPO analysis

RECOMMENDATION 5: The GAO recommended that if based on reliable data, a decision is made to further develop TC-AIMS II, the Secretary of Defense direct the Secretary of the Army to ensure that the program implements effective program management activities, related to risk management and performance based contracting. (p. 29/GAO Draft Report)

DoD RESPONSE: Partially concur.

The GAO recommendation is based on a finding that

"The Army has not fully implemented the department's risk management policy and guidance. While the program office developed a risk management plan, it has not effectively implemented it. For example, the program office identified 22 active risks to the program but only developed mitigation strategies for 16 of these risks, increasing the probability that program risks will lead to cost, schedule, and performance problems" (Page 3).

The above finding was based on a snapshot in time where, although risks to the program had been identified, comprehensive mitigation and contingency strategies had not been developed.

The program office possesses an active risk management program. In fact, subsequent risk management data was provided to the GAO on Oct 28 and Nov 3, 2005, reflecting contingency and mitigation strategies for all 22 entries and along with evidence that risks are continuously reviewed and updated. As the GAO review noted, the program office has implemented a strong process review for risk management. While a few risks were noted and not all personnel are trained in the risk tool, it should be understood that all key personnel in decision-making positions have been trained. The program office is comprised of Government, non-Government advisor, and the prime contractor's personnel. Contractor employees receive internal training as well as the augmentation that the program office program provides. Both personnel in the program and the actual

risks themselves are dynamic in nature requiring constant emphasis in this area. Despite the fact that the GAO noted that the lack of a mature DoD architecture was not a documented risk, the program office has implemented a strong mitigation strategy as part of its day-to-day operations.

The GAO commented that the contract does not provide for disincentives or penalties for failing to meet performance criteria (Page 26). In question is a Performance-based Cost-Plus-Award-Fee type contract. Award fees are determined for each option year with semi-annual evaluations. Part or all of an award fee not awarded in the first evaluation period may be carried to the second evaluation period; however, unearned award fees may not be carried from one option year to the next. The two-period assessment within a contract year provides interim feedback to the contractor. While the contract lacks direct disincentives, typically, failing to achieve substantial award fees is harshly received within a company. This personal disincentive for the direct employees is a powerful motivating factor. Further, egregious failures can result in a negotiated reduction in the base fee. The complexity of the effort and the inherent risks of development as noted by the GAO review drove the cost type contract. Using a strong award fee program encourages proper performance. By using a two-review within a contract period process, we believe that correct incentives are in place to encourage maximum results. We will address the contract award fee implementation in future reviews to ensure contractor performance is optimal.

GAO Contact and Staff Acknowledgments

GAO Contact

Randolph C. Hite, (202) 512-3439 or hiter@gao.gov

Staff Acknowledgments

In addition to the contact named above, Gary Mountjoy, Assistant Director; Justin Booth; Hal Brumm Jr.; Joanne Fiorino; Anh Le; Kush K. Malhotra; Teresa M. Neven; Dr. Rona Stillman; Amos Tevelow; and Bill Wadsworth made key contributions to this report.

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