



JOINT REQUIREMENTS  
OVERSIGHT COUNCIL

THE JOINT STAFF  
WASHINGTON, D.C. 20318-8000

JROCM 072-03  
21 Mar 03

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

Subject: Transportation Coordinators' Automated Information Management  
System II (TC-AIMS II) Operational Requirements Document (ORD)

The Joint Requirements Oversight Council (JROC) validated the addition of the enclosed Interoperability Key Performance Parameter (IKPP) to the TC-AIMS II ORD. The JROC confirms the addition of this IKPP will provide the operational capability necessary for TC-AIMS II to satisfy the mission need. ORD approval authority for non-KPP changes remains with the United States Army.

A handwritten signature in black ink, appearing to read "Peter Pace".

PETER PACE  
General, United States Marine Corps  
Vice Chairman  
of the Joint Chiefs of Staff

Enclosure

copy to:  
USD(AT&L)  
Chief of Staff, US Army  
DJ-4, Joint Staff

**OPERATIONAL REQUIREMENTS DOCUMENT (ORD)  
FOR  
THE TRANSPORTATION COORDINATORS' –  
AUTOMATED INFORMATION FOR MOVEMENTS SYSTEM II (TC-AIMS II)**

**1. GENERAL DESCRIPTION OF OPERATIONAL CAPABILITY**

a. The Department of Defense (DoD) requires an automated capability to provide accurate and timely requirements and real-time visibility of movements to support deployment, redeployment, and sustainment of U.S. Forces from within, and to, CONUS installations and overseas theaters of operations. The Transportation Coordinators' - Automated Information for Movements System II (TC-AIMS) will be used by transportation agents and deploying units of each service and other agencies to automate the processes of planning, organizing, coordinating, and controlling deployment, redeployment, and sustainment activities worldwide, in peace as well as during contingencies. It will provide a modernized, integrated, and easily deployable Automated Information System (AIS) that supports reengineered functional processes throughout DoD. TC-AIMS II will link all DoD component unit movement and installation transportation office/traffic management office (ITO/TMO) functionality into a consolidated, integrated, easily deployable, transportation management system.

b. **Mission Area and Defense Planning Guidance.** TC-AIMS II is within the DoD mission areas of mobility and sustainment. This is defined as transportation movement and support of DoD personnel and cargo during all phases of military operations in all environments, including reception, staging, onward movement and integration (RSO&I), and battlefield operations. As a joint information management system, the focus of TC-AIMS II within the broad area of mobility is the communication, information and automated processes needed by: units which are deploying; units/activities which are assisting in the deployment; units/activities which support daily movement missions as part of the defense transportation system (DTS); and command and control (C2) headquarters which support the deployment and employment of forces from every service. The TC-AIMS II focus includes daily transportation management, traffic management, commercial carrier interfaces, movement control and mode operations in garrison and at depots, consolidation activities, and trans-shipment locations.

c. **Mission Need.** TC-AIMS II must support the FY87 Joint Chiefs of Staff (JCS) direction and the FY89 Defense Guidance that provided a requirement for an automated capability to provide timely and accurate passenger/cargo movement information during force deployments. Further, system development and implementation must be consistent with FY95-99 Defense Guidance that called for support systems to provide "rapid strategic mobility and sufficient support and sustainment capabilities." TC-AIMS II must provide an integrated information transportation system capability for routine deployment, sustainment, and redeployment/retrograde operations by employing the same DoD and service shipment policies and procedures in peace and war and in both the active and reserve forces. This system must be integrated with installation, unit, and

depot-level supply systems to manage inbound and outbound movement (less household goods) document and requisition information. TC-AIMS II must be capable of supporting routine and surge requirements and must automate origin shipping/receiving and deployment; sustainment and redeployment/retrograde processes; produce movement documentation (including forms required by foreign nations); unit move data; and furnish timely information to major commands (MAJCOMS/MACOMS), transportation component commands, USTRANSCOM, and the joint deployment community. As a DoD source movement information system, TC-AIMS II must provide data for in-transit visibility (ITV) and control over cargo and passenger movement. TC-AIMS II is critical to the realization of Joint Vision's operational concept of Focused Logistics and is a part of USTRANSCOM's FY00-05 Integrated Priority List.

**d. Type of System Proposed.** TC-AIMS II is an AIS that will automate the process of planning, organizing, coordinating, and controlling unit-related deployments, sustainment, day-to-day installation transportation officer/transportation management officer (ITO/TMO) operations, redeployment, and retrograde operations in support of the Defense Transportation System (DTS). It will interface with installation, unit and depot-level supply systems, appropriate Joint and Service feeder systems to the Joint Operation Planning and Execution Systems (JOPES); and will be capable of supporting both peacetime and wartime requirements. TC-AIMS II will produce movement documentation and unit move information. It will furnish nearly instantaneous information to major commands (MAJCOMS/MACOMS), Transportation Component Commands (TCCS), USTRANSCOM, and the joint deployment community. As a DoD source movement information system, TC-AIMS II will be the source of information for in-transit visibility and transportation management over cargo and passenger movement during peace, operations other than war, and war. TC-AIMS II will integrate the functionality of selected, existing service-unique transportation legacy systems into a single AIS migration system. It will consist of a scaleable, deployable, distributed system environment, compliant with the Joint Technical Architecture (JTA).

**e. Operational and Support Concept**

(1) **Operational Concept.** TC-AIMS II will use tactical, garrison and commercial communications to operate in both garrison and deployed field operational environments and will directly support unit and force commanders, ITOs, and TMOS of all services, in-theater movements managers, trans-shippers, and mode operators supporting military operations. It will provide an automated transportation planning and execution capability for unit and individual cargo movements, allocate transportation assets where applicable, and support RSO&I operations within the theater of operations. TC-AIMS II will be the source of critical information for the Global Transportation Network (GTN) and the Global Command and Control System (GCCS)(JOPES modules). TC-AIMS II will operate within the Global Combat Support System (GCSS) environment as well as with the C2 systems at various command levels.

(2) **Support Concept.** TC-AIMS II is an AIS designed to operate in conformance with Defense Information Infrastructure (DII) Common Operating Environment (COE) and utilize and help implement the Shared Data Environment

(SHADE) as defined in the JTA established by the Defense Information Systems Agency (DISA). The Joint Program Management Office (JPMO) will be responsible for software development and installation while each service will be responsible for site preparation and hardware installation. The JPMO will coordinate and manage distribution of software and software updates to users, provide a technical assistance capability, and develop and provide initial training. Sustainment training will be a service responsibility.

## **2. THREAT**

The battlefield threats to TC-AIMS II include physical damage and destruction, reconnaissance and surveillance, computer network attack and computer network exploitation, electronic warfare (EW), directed energy weapons, nuclear weapons and their electromagnetic pulse effects, and chemical and biological weapons. It is possible that a threat force could detect, locate and target TC-AIMS II from its radio frequency emissions. An electronic attack threat force could detect and locate TC-AIMS II communications, then launch a denial-of-service attack with ground-based and airborne EW assets. Radio frequency weapons could assist in degrading or damaging critical command, control, and communications systems, computers, and automated information systems. The greatest threat to the TC-AIMS II system will be from computer network attack and computer network exploitation which could take the form of malicious code insertion, remote insertion of false data, Internet protocol spoofing, unauthorized computer access, interference or tampering with cable communications, direct signal attack, and indirect signal attack. "DIA-validated threat information in greater detail can be obtained from the following references: NAIC-1574-0210-00, Automated Information Systems Threat Environment Description (TED) and ONI-TA-009-97, Naval Command, Control, Communications, Computers, Navigation, and IFF Systems Threat Assessment Report (STAR)." This is a DIA-validated threat assessment.

## **3. SHORTCOMINGS OF EXISTING SYSTEMS**

a. Current systems fielded in individual DoD components cannot provide the DTS with an efficient joint support capability for unit movement and sustainment actions. Current systems also lack the flexibility to permit changes to accommodate emerging/evolving doctrine without significant software programming. This creates difficulties for the DTS to support U.S. policy of reacting to crises or conflicts with CONUS-based components supported by maritime prepositioning force/afloat prepositioning force assets. Individual DoD component systems support their own service's needs satisfactorily, but cannot adequately support joint or composite operations. Traffic management is defined in Joint Publication 1-02 as "the direction, control, and supervision of all functions incident to the procurement and use of freight and passenger transportation services." Today's DTS remains largely fragmented along DoD component and modal lines, reflecting the multiple oversight structure that currently exists. Management processes evolved independently for each mode of transportation, with the focus more on "local" as opposed to total transportation system

optimization. This fragmentation manifests itself in a number of deficiencies/mission needs. This creates difficulties for the DTS in supporting us policy of reacting to crises or conflicts with CONUS-based assets.

b. **Separate Systems for Each Service/Activity.** Each of the services and DoD activities operates its own separate systems to accomplish similar movement management and deployment-related tasks. These individual systems are not integrated to provide uniformity of information. There is a lack of standardization in data elements, data transmission formats, accessibility to information and source data capture capabilities. These limitations hamper DoD's ability to create an accurate common information picture of the status of deployments and DTS movements. Other operational impacts include: limited automated connectivity between/within the service/activity systems; separate transportation systems foster the growth of different, service-unique procedures to solve similar problems; separate, service-unique training courses must be developed and presented; and each system is maintained by a separate software development team.

c. **Swivel-Chair Information Management.** The separate systems operated by each service and activity cannot stand alone to satisfy the total information management needs for each unit or activity. This has led to the development of several systems across the services that serve the same user with different capabilities. To take advantage of all capabilities, the user is forced to acquire/use several different systems. Because these various systems were developed independently, there is limited horizontal and vertical interoperability among them. The user must learn to operate several different systems to accomplish his/her job, which lengthens training time and increases training complexity.

d. **Command and Control Information Deficiency.** The separate systems operated by each service/activity are not fully integrated with service-unique command and control systems, or joint command and control systems, resulting in a lack of advance movement information. This deficiency restricts the movement of accurate peacetime and wartime information, captured at the operational level, to other commands and supporting elements. This deficiency is most significant when the information relates to force deployment. Command and control headquarters, both for the deploying force and the supported combatant commander, require immediate access to an accurate picture of the deployment status.

e. **Multiple Operating Environments.** The separate systems operated by each service/activity provide different levels of capability to transition from daily operations to a higher OPTEMPO (e.g., to support a large force deployment or increased shipment levels). Some systems have an ability to operate on the battlefield while others have been designed to operate in garrison conditions with a specific communications interface requirement. The services need an integrated DoD transportation system operated by units that deploy, units that support the deployment, and service/DoD activities both in peace and war. The integrated system must be capable of operating in all environments, at any OPTEMPO, and with a variety of communications support options.

f. **Customer-Specific Needs.** The DTS community includes many different types of customers. Each customer type has specific information needs that are not currently being met in a DoD-standard system. The system customers listed below represent the baseline user community that will operate this information system.

(1) **Deployment Managers in Deploying Elements.** Deploying unit commanders must translate information about the mission they are deploying to support into detailed and realistic movement plans for the deployment. This translation occurs in a short time period when information continually changes about available lift assets, mission details, and unit assets allocated to support the mission. The deployment managers, acting for the unit commander, must use this volatile information to plan unit convoys; schedule and track events; prepare load plans for vehicles, rail cars, aircraft or ships; prepare Military Standard Transportation and Movement Procedures (MILSTAMP)/Electronic Data Interchange (EDI) documentation; and account for equipment, personnel, consumable supplies and funds. The current information management tools available to the deployment managers in all services are not integrated and do not readily support the OPTEMPO for a crisis deployment. In addition, integrated and well-established wireless communication capability does not now exist for deployment managers.

(2) **ITO/TMO at Post, Camp, Station and Base.** The ITO/TMO is charged with coordinating transportation services, preparing shipment documentation and certifying funding for all freight items and group passenger movements. This mission supports unit deployments, shipping sustainment items to support the deployed forces and daily inbound/outbound shipments to support installation/depot business. The information management tools available to the ITO/TMO staff are not fully integrated with the other installation/depot business. The ITO/TMO systems do not have a common electronic interface to commercial carrier systems. Current systems are limited in their ability to do on-time data entry, minimize man-machine interaction and electronically exchange data thereby causing business process inefficiencies. A lack of fully integrated systems and communications also delays the reporting of accurate in-transit visibility information.

#### **4. CAPABILITIES REQUIRED**

Requirements are delineated as threshold or objective; some requirements are further defined as Key Performance Parameters (KPPs). Capabilities will be fielded in block upgrades. A threshold value is the minimum acceptable value that is necessary to satisfy the operational need. An objective value is that desired performance above the threshold. A KPP defines capabilities or characteristics so significant that failure to meet the threshold can result in program reevaluation. Before development beyond Block 2, the ORD for TC-AIMS II will be revalidated by the JROC, and the Army will obtain a Milestone B approval from the MDA. IKPPs which meet the requirements specified in the IMD, GIG, and GCSS CRD will be included in the ORD being developed for Block 3 of this program.

a. **System Performance.** TC-AIMS II must provide units the capability to rapidly plan and deploy to meet combatant commander-required delivery dates. It must provide ITO/TMO's day-to-day traffic management functions, and transportation managers the capabilities to effectively utilize theater common lift assets. It must also allow combat service support organizations and supporting commands to sustain the force and perform effective movement control and coordination, distribution, and sustainment activities; both enroute and in theater. In a networked environment, TC-AIMS II must support preparation, processing, and documentation commensurate with the volume transportation movement information at the task organization level; that is, where detailed cargo and personnel data is aggregated into deployment and transportation plans, normally at the major subordinate command levels. TC-AIMS II shall include the capability to support hand-held scanners for originating, trans-shipping and receiving locations. TC-AIMS II will be designed to minimize or eliminate the amount of typing (keystrokes) required once a shipment is entered into the system.

(1) **Concept of Employment**

(a) **Mission Profiles**

1 TC-AIMS II receives input files from other systems, helps transportation coordinators process data, and produces outputs in the form of reports, labels, auto-matic identification technology (AIT) tags and cards (linear and two dimensional barcodes, Optical Memory Cards OMCS, and Radio Frequency RF Tags), screen displays, and electronic outputs to interfacing systems. TC-AIMS II will be employed during day-to-day traffic management and unit movement activities typically 12 hours a day, seven days a week. During deployment exercises and real-world contingencies, TC-AIMS II will be employed for 24 hours a day, seven days a week, with surges of activity occurring at the beginning of deployments, and again during redeployment or onward movement of forces. The system design will support database and system maintenance activities that can be scheduled around deployment operations and exercises. Additionally, database and systems maintenance activities, specifically backups, will at no time preclude user access to the system.

2 Combatant commander or Joint Task Force (JTF) deployment plans and schedules drive the volume of processing activity, generally heaviest in the first 45 days. The level of output products, such as reports and electronic interface traffic, can be derived from the number of strategic lift assets supporting a movement, together with local bus, truck, Materiel Handling Equipment (MHE) support, convoy movement schedules, rail movement schedules and the volume of shipments in a given period.

3 The architecture of TC-AIMS II consists of standalone workstations, regionalized servers, or a hierarchy of "deployable" peer-to-peer connected servers networked throughout the operational chain of command, with the servers being connected to client workstations and laptop computers at staff and organizational unit levels.

(b) **Mission Essential Functions**

1 The system must allow units, deployment support activities, movement control & coordination organizations, and traffic management organizations, to maintain equipment and personnel databases; and to manage, control, and direct organic and common user transportation assets.

2 The system must automate movement planning processes as defined by information flows for matching time-phased force and deployment data (TPFDD) cargo & personnel detail with actual unit deployment lists, convoy movement data, organic equipment availability reports, and DTS cargo movement procedures.

3 The system must provide an automated ability to organize unit and organizational deployment list data into aircraft, ship, rail (including Combatant commander-specific rail car data), truck, and container load planning data, such as air cargo chalks, or ship team assignments. For rail and truck movements, it will be the automated tool to assist load planners in developing actual load plans.

4 The system must automate movement coordination and control activities as defined by joint tactics, techniques, and procedures for movement control and convoy operations. The activities that TC-AIMS II automates will be based on standard movement forms, reports, requests, and tasking procedures from the legacy migration systems or the manual forms and information flows currently used to accomplish movement coordination.

5 The system must automate traffic management functions or theater distribution as defined by DTS procedures for cargo and personnel movement. The activities that TC-AIMS II automates will be based on DoD standard and theater specific movement forms, freight bills, processes, information flows, electronic interfaces, and documentation used to tender tactical, organic, or commercial transportation support.

6 The system must read and write AIT media as identified in para 4.a.(1)(a).

7 TC-AIMS II should possess the capability to notify the origin terminal if information sent to it is not readable.

(c) **Employment Tactics.** TC-AIMS II will be employed at the unit logistics (Embarkation and unit movement officer (UMO) sections), through each level of command to major (MAJCOM/MACOM) or task force that deals with detailed unit transportation and deployment data. It is used in all garrison/installation and forward deployed locations where deployment planning and execution is accomplished, including aboard ship and at remote ports, beaches, airfields and traffic nodes. It is also used with traffic management and theater movement control. It will operate on existing information infrastructure networks, or in a standalone mode, for occasions where robust communications are not available.

(d) **Environmental Conditions.** TC-AIMS II must be operable and maintainable under all conditions of climate and terrain where joint task forces deploy. It

will be used under hot, basic and cold conditions (inclement temperatures of -25 to 140 degrees Fahrenheit). TC-AIMS II will be operated and maintained by users while wearing appropriate clothing to include mission oriented protective posture (MOPP) and cold weather gear. It may be assumed that computer workstations, servers and peripherals will require some degree of shelter from the elements, such as the inside of a truck, container or tent while in expeditionary environments.

(e) **Environmental Quality.** The user of TC-AIMS II shall have the ability to train, operate, maintain and dispose of the system in full compliance with applicable U.S., foreign, and international environmental quality laws and regulations. The design, production, operation, maintenance and disposal of the system shall eliminate or minimize to the greatest extent possible, adverse environmental quality impacts.

(f) **Information Assurance.** Addressed in paragraphs 2 and 5.c (2).

b. The primary performance (operational and system) capabilities for TC-AIMS II are listed below. The **asterisked (\*)** items are the key performance parameters (KPPs).

(1) The system must have a capability to receive input from peripheral automatic identification technology devices capable of reading from the AIT media listed in Table 1 below. **(Critical, KPP)\***

**Table 1 – AIT Device Input Parameters**

Type	Description	Threshold	Objective
Linear Bar Codes	Code 3 of 9 MSLs, LOGMARS, TCN labels	Completeness: .90 Accuracy: .95 Speed: N/A	Completeness: .95 Accuracy: .98 Speed: N/A
2d Bar Codes	Mh10.8, PDF 417 labels	Completeness: .90 Accuracy: .95 Speed: N/A	Completeness: .95 Accuracy: .98 Speed: N/A
Radio Frequency ID Tags	Equipment ID tags	Completeness: .85 Accuracy: .90 Speed: ability to completely read a tag fixed to a vehicle traveling <= 25mph	Completeness: .90 Accuracy: .98 Speed: ability to completely read a tag fixed to a vehicle traveling <= 45mph
Optical Memory CARDS (OMC)	Defense Logistics Agency (DLA) AMS cards	Completeness: N/A Accuracy: N/A Speed: N/A <i>Threshold parameter cannot be identified because there is no existing standard.</i>	Completeness: .95 Accuracy: .98 Speed: <= 1 second per card

SMART Cards		Completeness: .90 Accuracy: .95 Speed: N/A <i>Threshold parameter cannot be identified because there is no existing standard.</i>	Completeness: .95 Accuracy: .98 Speed: <= 1 second per card
-------------	--	--	---

**Notes:**

1. Completeness measures the thoroughness of sought information. The database must be designed such that all required information elements necessary to produce specified outputs or read defined inputs are included. This is not a measure of data quality.
2. Accuracy describes the format, content, compatibility, and validity (size, class or type) consistent with the TC-AIMS II data dictionary. The DoD data model (DDM) should be used as a guideline to facilitate data compatibility and interoperability with other systems. Beyond these definitions, TC-AIMS II will not be responsible for editing faulty information.
3. Speed: Some items are “not-applicable” since laser scan reads occur at light-speed.
4. Speed for OMC cards implies both read and write times.
5. TC-AIMS II will facilitate the administrative processing and manifesting of passengers through the ability to read DoD standard manifest data elements from DoD standard smart cards.

(2) TC-AIMS II must provide an automated ability for users to process data and information into decisions and execution actions to accomplish appropriate transportation and deployment tasks. **(Critical)**

(a) The system must be able to import, store, process, update, and export operational data volume in support of major theater war deployment scenarios and traffic management operations. The threshold is that TC-AIMS II provides the ability for users to accomplish job related tasks efficiently or as well as the best of breed of existing systems. The objective is for functional activities defined in this ORD to be automated in such a way as to reduce time required to perform those functions by at least 20 percent. This parameter assumes that competent and trained users, who understand how to prepare required documents, are using the system as part of their normal duties. **(Critical, KPP)\***

(b) The system must meet the processing data parameters listed in Table 2.

**Table 2 – Processing Data Parameters**

<b>Activity Description</b>	<b>Threshold</b>	<b>Objective</b>
Maintain unit level deployment database for unit level equipment, container & pallet, and personnel lists associated with any battalion or squadron level unit.	Standalone: 75,000 cargo detail records. Single server: 1,000,000 cargo detail records.	Standalone: 500,000 cargo detail records. Single server: 3,000,000 cargo detail records.
Create, receive, maintain, and transmit parent-child deployment relationships to include use of deployment echelons. (example: box on a truck, pallet in container)	Standalone: 98,901 parent-child relationships. Single server: 1,483,515 parent-child relationships.	Standalone: 197,802 parent-child relationships. Single server: 1,978,020 parent-child relationships.
Movement planning of cargo & personnel detail - aggregate unit level databases. (capability to merge or “rollup” unit level databases up the chain of command, assuming an average of 300 cargo line items per ULN, and 250 personnel billet line items per ULN).	Standalone: 2,500 unit line numbers (ULN)s containing sourced cargo or personnel detail records matched to UTC cargo or personnel force requirement details. Single server: 10,000 ULNS.	Standalone: 5,000 ULN records. Single server: 50,000 ULNs
Movement planning: ability to pass cargo and personnel detail data to JOPES feeder systems and GTN to report, load plan, manifest, and source ULNS of a force requirement.	Sealift ULNS: 10 C-days worth of data Airlift ULNS: 3 C-days worth of data. Local or cult ground transportation: 30 days	Sealift ULNS: 30 C-days Airlift ULNS: 7 C-days Local or cult ground transportation: 60 days
Ship load planning and manifesting. Ability to store and process cargo data details for export to ship load planning systems in support of port operations and embarkation. (based on a typical IHA or FSS ship load plan):	Cargo detail data for 5 ships at a single terminal or water port during a 72-hour period.	Cargo detail data for 10 ships at a single terminal or water port during a 72-hour period.
Aircraft load planning and manifesting. (based on a typical C-141 aircraft load plan)	Cargo & personnel detail data for 50 aircraft sorties processed at a single air terminal during a 24-hour day.	Cargo & personnel detail data for 100 aircraft sorties processed through a single air terminal during a 24- hour day.
Rail load planning (based on a 100 car train)	Cargo detail data for 25,000 shipment units.	Cargo detail data for 60,000 shipment units.
Surface & ground transportation modes. Receive or prepare, generate, and transmit bills of lading (GBLS/CBLS), tonnage distribution rosters (TDRS), or transportation control movement documents (TCMDS) per 24-hour day:	GBLS & CBLS: 500 TCMDS: 1,000 TDRS: 25	GBLS & CBLS: 1,000 TCMDS: 5,000 TDRS: 100
Convoy movement requests (based on a 25-vehicle convoy).	25 per day	50 per day
Ad-hoc queries. A trained user can extract a simple query, such as; determining equipment density for a given unit, or preparing a list of GBLS moving equipment to a given port.	45 minutes to formulate the query and obtain correct results.	25 minutes to formulate the query and obtain correct results.
Standard reports.	20 minutes	10 minutes

(c) TC-AIMS II must produce outputs in the form of electronic interfaces (to external mode clearance, cargo booking, load planning, transportation C2, TPFDD feeder and common use transportation systems), as well as produce standard labels, RF tags, forms, and reports used to accomplish transportation and deployment functions. **(Critical)**

1 TC-AIMS II must interface with the systems identified as outputs in the IER matrix attached at Table B (attached). **(Critical, KPP) \***

2 TC-AIMS II must properly generate reports, forms, labels, RF tag, OMC or CAC data as listed in Table 3 below. By “properly” this means that correct data is placed in the appropriate fields, that text is readable by humans, or that bar-codes, cards or tags are readable by appropriate AIT devices. The parameters below assume that a printer, RFID tag read/write device, and OMC/CAC card read/write devices are directly connected to a workstation hosting its own TC-AIMS II database. **(Critical, KPP) \***

**Table 3 – Output Descriptions**

Output Type	Description	Threshold	Objective
Reports	Ad Hoc or Standard (pre-formatted)	Completeness: .95 Accuracy: .95 Speed: <= 1 min per page	Completeness: .98 Accuracy: .98 Speed: <= 30 sec per page
Standard forms	DD, SF, NAVMC, AF, AE and other paper outputs	Completeness: .95 Accuracy: .95 Speed: <= 1 min per page	Completeness: .98 Accuracy: .98 Speed: <= 30 sec per page
Labels	LOGMARS, Military Shipping Labels, Equipment ID Labels	Completeness: .95 Accuracy: .95 Speed: <= 30 seconds per label Durability:	Completeness: .98 Accuracy: .98 Speed: <= 10 seconds per label Durability:
Radio Frequency Tags (write data)	8and 128 Kb or larger capacity	Completeness: .875 Accuracy: .875 Speed: <= 1 min per tag	Completeness: .90 Accuracy: .90 Speed: <= 30 seconds per tag
OMC cards		Completeness: .95 Accuracy: .95 Speed: <= 30 seconds per card	Completeness: .98 Accuracy: .98 Speed: <= 10 seconds per card
CAC (write data)		Completeness: .95 Accuracy: .95 Speed: N/A	Completeness: .98 Accuracy: .98 Speed: <= 30 seconds per card

### c. Information Exchange Requirements (IERS)

The top level information exchange requirements (IERS) for the initial capability will be satisfied by meeting 100% of the interface requirements identified as critical in IER Matrix at Table B (i.e., the system must accept and provide properly formatted data in accordance with the systems interface agreement (SIAS) from those systems with an (“yes” in the critical column). As capabilities are subsequently added, interoperability requirements will change thus requiring adjustment to the top-level IERS. The top level IERS for the objective system will be satisfied by meeting 100% of the interface requirements identified as objective in the IER Table.

**Rationale:** In order to provide the capabilities needed (i.e., accomplish transportation and deployment functions), TC-AIMS II must accept input and produce outputs in the form of electronic interfaces (to external mode clearance, cargo booking, load planning, transportation C2, TPFDD feeder, and common user transportation systems), as well as produce standard labels, tags, forms and reports. **(Critical, KPP) \***

### d. Logistics and Readiness

(1) **Logistics Supportability Objective.** TC-AIMS II must be logistically supportable.

(a) TC-AIMS II will be fielded on commercial off the shelf (COTS) computers that meet JTA compliance standards, and service specific computer hardware acquisition requirements.

(b) TC-AIMS II will be supported using standard service systems support programs in place for automated information systems at the time of fielding.

#### (2) **Reliability, Availability and Maintainability Objective**

(a) **TC-AIMS II Must be Reliable.** TC-AIMS II shall have a mean time between operational mission failure (MTBOMF) of 300 hours (threshold), 500 hours (objective). Mission duration for one crew is 12 hours. MTBOMF is the anticipated length of time a system will be operational between operational mission failures. An operational mission failure is defined as that condition in which the system cannot perform or accomplish the stated mission. Failure can be due to software, hardware, or operator error.

#### (b) **TC-AIMS II Must be Available**

1 TC-AIMS II availability will be 0.95 (threshold); 0.975 (objective).

2 TC-AIMS II non-availability will be correctable 90% of the time by simply rebooting the computer and the reboot will take less than 3 minutes.

3 When TC-AIMS II non-availability is not correctable by a reboot, the TC-AIMS help desk must be able to respond to and correct the problem within 2 hours 80% of the time.

4 For help desk calls that cannot be successfully corrected

within 2 hours, the problem will be corrected within 24 hours 99% of the time.

(c) **TC-AIMS II Must be Maintainable**

1 Maintenance will be conducted in accordance with the maintenance concept, the Supportability Strategy (SS) and the service annexes to the SS.

2 Mean time to repair (MTTR) at the organizational level (system operation) will be 1 hour (threshold); 30 minutes (objective).

3 Mean time to repair (MTTR) at the organizational level (lost information) is 8 hours (threshold); 1 hour (objective).

(3) **Mobility, Deployability and Transportability Objective.** TC-AIMS II must be capable of movement to, from and within the joint or service component area of operations.

(a) All TC-AIMS II equipment must be capable of movement by DoD personnel as a 2-person lift with a weight maximum of 70 pounds (threshold); as light as technically feasible (objective).

(b) Any deployable TC-AIMS II equipment as designated by the Service must be equipped to provide protection from shock, vibration, and weather in accordance with Service-specific concepts of operation.

(c) All TC-AIMS II equipment must be capable of movement by all standard modes of transport to include u.s. Navy shipping, commercial or military aircraft, and military tactical vehicles.

(d) The system shall be transportable in tactical military/amphibious vehicles both on and off paved roads and through the surf with no detrimental effects on the TC-AIMS II equipment or degradation of operational effectiveness to the equipment.

(e) The system will require no unusual loading/handling equipment.

(f) TC-AIMS II containers shall be ruggedized, waterproofed and designed for ease of handling and embarkation.

(4) **Organizational Impact Objective**

(a) The TC-AIMS II should have no impact on the structure of the unit to which assigned.

(b) Fielding of TC-AIMS II to any unit should not require the assignment of additional occupational specialties to the organization.

(5) **Personnel Selection and Training Objective**

(a) TC-AIMS II in some cases replaces standalone systems that were not built to operate in a network environment. TC-AIMS II should be able to be operated and maintained with minimal additional training for users having the appropriate MOS, beyond that currently taught for the legacy systems being replaced.

1 TC-AIMS II system operators should require no more than two weeks (threshold); one week (objective) system training to become proficient operators of the system.

2 TC-AIMS II system administrators should require no more than two weeks (threshold); one week (objective) training to allow them to become proficient system administrators of the system.

3 TC-AIMS II database administrators should require no more than two weeks (threshold); one week (objective) training to allow them to become proficient database administrators of the system.

#### **e. Environmental, Safety and Occupational Health (ESOH), and Other System Characteristics**

##### **(1) Human Factors and Safety Objective**

(a) TC-AIMS II human factors will support operation, maintenance, and support of the system.

1 TC-AIMS II will employ intuitive operating procedures (based on the processes which are being automated) characterized by a consistent graphic user interface across the range of applications.

2 Visual indicators and screens will be easily readable in all ambient light conditions without the need for ancillary equipment.

3 TC-AIMS II shall provide the capability for system data input and control using multiple means (keyboard and mouse or trackball).

(b) TC-AIMS II does not present major safety or health hazards while being operated, maintained, or supported. TC-AIMS II shall contain no hazards that will cause death, severe occupational illness, or irreversible damage to health.

##### **(2) Electromagnetic Environmental Effects**

TC-AIMS II (JPMO) will invite the attention of the services to the requirements of paragraph 4.4.7 of DoD regulation 5000.2r as they pertain to service procurement of hardware for use with TC-AIMS II.

## **5. PROGRAM SUPPORT**

TC-AIMS II is a joint system that will be an integral part of the operational DTS. TC-AIMS II must interface and exchange or share information with appropriate service and joint transportation, material, supply, munitions, personnel, finance, command and control and other systems identified in the TC-AIMS II configuration management board-approved joint requirements office database. The joint potential designator for TC-AIMS II is Joint.

### **a. Maintenance Planning**

(1) **Overall Maintenance Concept.** TC-AIMS II will use currently available

commercial off-the-shelf (COTS) technology. Services will administer and oversee equipment and software maintenance and replacement. The joint program management office (JPMO) will maintain TC-AIMS II software, distribute software upgrades, and maintain a help desk to resolve user problems. Software support and maintenance will be required for the life of the program.

(2) **JPMO Help Desk.** Users will be able to contact the help desk by web site, e-mail, fax, or phone. Help desk personnel will ensure that all problem reports are captured, prioritized, and resolved on a consistent and timely basis. JPMO will provide the user with interactive access to a current list of known system problems and solutions. JPMO will document unresolved software problems and create software change requests as described in the configuration management plan.

(3) Hardware and communications problems unique to services will be referred to the appropriate service representative for resolution.

#### b. **Support Equipment**

No unique support equipment is anticipated.

#### c. **C4I/Standardization, Interoperability and Commonality**

(1) TC-AIMS II must comply with applicable provisions contained in the JTA to include DII COE, minimum level 6 (Threshold) and Level 8 (Objective), for all blocks and use DoD standardized information where compatible. JITC needs to test for operation in a joint information system infrastructure.

(2) The security strategy for TC-AIMS II will be based on guidance by public law and U.S. government information assurance community policy, directives, and instructions. Hardware and software must meet the requirements established for the highest classification of data accessible in accordance with applicable standards and regulations. Since TC-AIMS II will provide a 2-way interface to appropriate Joint and Service feeder systems to JOPES ;it must be capable of exchanging data with a classified system. Although TC-AIMS II will not be a classified system, its data is sensitive. TC-AIMS II will receive or process information according to the guidelines set forth by DoD and each service, including protection for data aggregation at a higher level as necessary.

d. **Computer Resources.** All TC-AIMS II applications will be written to system component application programming interface standards. The TC-AIMS II computer resources must be DII COE compliant. The use of commercial off-the-shelf and government off-the-shelf hardware/software is highly encouraged.

#### e. **Human Systems Integration**

(1) **Manpower.** TC-AIMS II will not increase the number of personnel or change the end strengths of the DoD military components. The system will be used by transportation and traffic management personnel of all services and defense agencies

when supporting ITO/TMO, movement control, and mode management requirements and by unit movement personnel of all services and defense agencies when performing unit movement and load planning requirements. Distributed systems applications will require changes to individual training standards for user specialty codes to accomplish database and system administration functions.

(2) **Skill Level.** The system will not require new occupational specialties for the DoD military components. The human computer interfaces (HCI) are to be developed in such a way as to provide for an intuitive, easy-to-use system, thereby minimizing training and maintenance requirements. The assumption should be that the average user will be familiar with functional processes, policies, and procedures, and that TC-AIMS II is merely a tool to help the user accomplish tasks faster and easier than it would be to perform those tasks manually, without an AIS. Users must maintain a validated level of training.

(3) **Training Concept.** The JPMO will provide initial training. Long-term training will be a service responsibility. System training will address operator, system administration, data administration and system maintenance. Multimedia training, using the most cost-effective employment of the latest interactive training techniques will be on a separate CD-ROM that must be periodically updated to reflect the changes to the system. It will encompass instructor and key personnel (IKP) training, including the operator/unit movement officer, supervisor/manager, system support personnel, system administrator and data administrator. Multimedia training will include as a minimum an operator/unit movement course, supervisor/manager course, system administrator/data management course, and ITO/TMO course. Two multimedia packets will be developed. One will have hooks embedded into the prime system software and the other training packet will be TC-AIMS II specific and can be used on Windows 95; training screens will be identical to the prime system screens and help capabilities. As much as possible, TC-AIMS II will employ COTS software with standard screen and context-sensitive help functions. JPMO will provide multimedia training packages to the services. JPMO will provide upgrade training packages to the services before system upgrades are fielded.

(4) **User Manuals.** TC-AIMS II JPMO will provide vendor documentation and electronic user manuals to include updates. Technical manuals for COTS operating hardware and software will be provided by the services.

(5) **Human Factors Engineering.** The design of TC-AIMS II will be in accordance with appropriate DoD ergonomic manuals and regulations regarding HCI requirements (e.g., style guide). Visual indicators and messages shall be easy to read in varying light conditions. Displays shall be adjustable for varying light conditions.

(6) **Health/Safety.** TC-AIMS II will be designed to minimize safety and/or health problems that could reduce job performance or system effectiveness in the projected operational environment.

f. **Other Logistics Considerations.** TC-AIMS II will not introduce anything new

into the national supply system and there will be no central provisioning. The system will not require special packaging, handling, or transportation considerations. The software shall be designed, developed, and delivered using software quality assurance standards to allow future competitiveness of software support for the entire software system. Based on the optimal hardware configuration, a minimum of 80 percent spare computer memory over delivered memory used shall be available for expansion for future use. A minimum of 80 percent reserve timing for each computation cycle and an average of 80 percent reserve shall be available for all cycles. The threshold value is 80 percent, and the objective is 100 percent.

**g. Transportation and Basing.** There are no lift constraints. Standard systems can be purchased and palletized for deployment on an as needed basis. TC-AIMS II will be employed as both a garrison and a deployment-capable system. In garrison, the system will be installed and used in existing facilities with no change to the basing concept. The only criteria for deployment of the system are communications connectivity and power availability. The proposed TC-AIMS II system shall be compatible with existing C4I systems and equipment, and interface with other U.S. and Allied nations' functionally related C4I systems and equipment.

**h. Geospatial Information and Services.** Where required, National Imagery and Mapping Agency standard products will be used.

**i. Environmental Support.** When TC-AIMS II operates outside of an enclosed garrison environment, it shall be protected from the elements by an appropriate cover. TC-AIMS II will operate on COTS hardware, which must be capable of being powered by U.S. military mobile electric power (MEP) power sources and host nation household/commercial power supply. TC-AIMS II shall be capable of operation from standard MEP generators, shipboard, aircraft, or vehicle-generated power. TC-AIMS II will be in compliance with all applicable standards' categories within the DoD JTA to include, but not limited to: information processing standards category, information transfer standards category, information modeling and information standards category, human-computer interface standards category, and information systems security standards category.

## **6. FORCE STRUCTURE**

TC-AIMS II hardware will be fielded by the services. The JPMO will recommend, to the services, hardware components which will follow DISA guidelines for hardware in the publication CM 400-25-05, DII COE baseline specifications version 3.0 (draft) of 31 Oct 96 and applicable sections of the JTA. JPMO will distribute software to system users.

## **7. SCHEDULE CONSIDERATION**

**a. Initial Operational Capability (IOC).** Following initial operational testing and an operational assessment of TC-AIMS II version 3.01 at test sites, a fielding decision will be sought from the milestone decision authority to approve fielding TC-AIMS II with partial unit move functionality. The first milestone III fielding decision will constitute IOC.

b. **Full Operational Capability (FOC).** FOC will be realized when system functionality is fully fielded and when process improvements and identified enhancements have been incorporated at each of the service's sites. TC-AIMS II will also have met all operational requirements. It will be capable of operating with functioning interfaces to identified service operational support systems to access information in support of ITO/TMO and unit movement operations.

## 8. PROGRAM AFFORDABILITY

### a. Program Cost

TC-AIMS II is being developed using an evolutionary acquisition strategy. Capabilities will be developed and fielded in seven blocks. IOC will be achieved upon the completion of fielding of Phase I/ Block 1. The subsequent six blocks will add capability via software upgrades and will culminate in FOC upon completion of fielding of block 7.

### b. Phase I/ Block 1 (Version 3.01) Basic Unit Move

Phase I/ Block 1 (version 3.01) basic unit move capabilities provide the ability to plan, coordinate and execute unit movements. This includes maintaining equipment and personnel databases; organizing unit equipment and personnel list for air, rail, ship, truck or container load planning; determining transportation requirements; and interfaces with designated supply, personnel, transportation and C2 systems. This capability also supports the CJCS goal for a 72-hour validated TPFDD time standard for the first seven days of deployment. Table 4 shows the Phase I/Block 1 schedule. The Phase I/Block 1 cost values in Table 5 are expressed in FY02 constant dollars.

**Table 4 – Phase I/Block 1 Schedule**

<b>Event</b>	<b>Start Date</b>	<b>End Date</b>
Phase I development	2d QTR FY98	4th QTR FY01
Operational test & evaluation	4th QTR FY01	2nd QTR FY02
Fielding decision review		2nd QTR FY02
Fielding phase I	2nd QTR FY02	4th QTR FY05

**Table 5 – Phase I/Block 1 Cost**

<b>Phase I/Block 1 (Constant FY 02 \$ in K)</b>	<b>Objective</b>	<b>Threshold</b>
RDT&E	\$37,586	\$41,345
<b>Procurement</b>		
USA	\$5,251	\$5,775
USAF	\$403	\$443
USMC	-	-
USN	-	-
<b>Total Phase I Procurement</b>	<b>\$5,654</b>	<b>\$6,219</b>
<b>Acquisition O&amp;M</b>		
USA	\$162,375	\$178,612
USAF	-	-
USMC	-	-
USN	-	-
<b>Total Phase I Acquisition O&amp;M</b>	<b>\$162,375</b>	<b>\$178,612</b>
<b>Total Phase I Acquisition Cost (RDT&amp;E + Procurement + Acquisition O&amp;M)</b>	<b>\$205,615</b>	<b>\$226,177</b>
<b>Operations &amp; Support</b>		
USA	\$1,626	\$1,788
USAF	-	-
USMC	-	-
USN	\$54	\$60
<b>Total Phase I Operations &amp; Support</b>	<b>\$1,680</b>	<b>\$1,848</b>
<b>Total Phase I Life Cycle Cost</b>	<b>\$207,295</b>	<b>\$228,025</b>

**Footnotes:**

1. Phase I sunk costs from FY96-01
2. Phase I RDT&E is FY01 only. Development costs for FY96-FY00 are reflected in acquisition O&M (USA)

**c. Phase II / Blocks 2-7**

Incrementally developed block upgrades build on the technical architecture and functional foundation of the Phase I developed system. The program office will develop block upgrades as designed and prioritized by the joint requirements office and approved by the TC-AIMS II configuration management board. Table 6 shows the Phase II/Blocks 2-7 schedule. The Phase II cost values in Table 7 are expressed in FY02 constant dollars.

**Table 6 – Phase II/Blocks 2-7 Schedule**

Event	Start Date	End Date
Define and prioritize IDPs	1 <sup>st</sup> QTR FY 00	4 <sup>th</sup> QTR FY 01
Develop & Test Block 2, (IDPs 0,1)	2 <sup>nd</sup> QTR FY 02	4 <sup>th</sup> QTR FY 03
Develop & Test Block 3, (IDPs 2,3)	2 <sup>nd</sup> QTR FY 03	4 <sup>th</sup> QTR FY 04
Develop & Test Block 4, (IDPs 4,5)	2 <sup>nd</sup> QTR FY 04	4 <sup>th</sup> QTR FY 05
Develop & Test Block 5, (IDPs 6,7)	2 <sup>nd</sup> QTR FY 05	4 <sup>th</sup> QTR FY 06
Develop & Test Block 6, (IDPs 8,9,10)	2 <sup>nd</sup> QTR FY 06	4 <sup>th</sup> QTR FY 07
Develop & Test Block 7, (IDPs 11,12)	2 <sup>nd</sup> QTR FY 07	4 <sup>th</sup> QTR FY 08
Block Upgrade Fielding	4 <sup>th</sup> QTR FY 03	4 <sup>th</sup> QTR FY 09

**Table 7 – Phase II/Blocks 2-7 Schedule**

Phase II Blocks 2-7 (Constant FY 02 \$ in K)	Objective	Threshold
RDT&E	\$178,967	\$196,864
<b>Procurement</b>		
USA	\$146,821	\$161,504
USAF	\$24,968	\$27,464
USMC	\$19,280	\$21,208
USN	\$11,201	\$12,321
<b>Total Block 2-7 Procurement</b>	<b>\$202,270</b>	<b>\$222,497</b>
<b>Acquisition O&amp;M</b>		
USA	\$244,233	\$268,656
USAF	\$44,448	\$48,893
USMC	\$47,232	\$51,956
USN	\$16,526	\$18,179
<b>Total Block 2-7 Acquisition O&amp;M</b>	<b>\$352,439</b>	<b>\$387,683</b>
<b>Total Block 2-7 Acquisition Cost (RDT&amp;E + Procurement + Acquisition O&amp;M)</b>	<b>\$733,676</b>	<b>\$807,044</b>
<b>Operations &amp; Support</b>		
USA	\$513,660	\$565,026
USAF	\$31,363	\$34,500
USMC	\$70,831	\$77,914
USN	\$15,461	\$17,008
<b>Total Block 2-7 Operations &amp; Support</b>	<b>\$631,316</b>	<b>\$694,448</b>
<b>Total Block 2-7 Life Cycle Cost</b>	<b>\$1,364,992</b>	<b>\$1,501,491</b>
<b>Total Program Cost</b>	<b>\$1,572,287</b>	<b>\$1,729,516</b>

d. Although the total program is not fully funded to the Total Program Cost levels below the threshold requirement, Phase 1 (Version 3.01) Basic Unit Move is fully funded. The objective system requirements in Phase II (Blocks 2-7) will be developed and fielded incrementally as funds are made available through future budgeting processes. See paragraph 1e, "Benefits of Evolutionary Acquisition," for a description of each Block.

## **Appendixes**

A—References

B—Distribution List

C—List of ORD supporting analysis

D—CRD(s) – ORD KPP/requirements cross walk/linkage

(Will be included in the next update of this ORD)

# Glossary

## Acronyms

---

AIS	automated information system
AIT	automatic identification technology
C2	command and control
COE	common operating environment
COTS	commercial off-the-shelf
DDM	DoD data model
DIA	defense intelligence agency
DII	defense information infrastructure
CBL	commercial bill of lading
CINC	commander in chief
CONUS	continental united states
DoD	department of defense
DTS	defense transportation system
EW	electronic warfare
FOC	full operational capability
GBL	government bill of lading
GCCS	global command and control system
GCSS	global combat support system
GTN	global transportation network
HCI	human computer interface
ILSP	integrated logistics support plan
IOC	Initial operational capability
ITO	installation transportation officer
ITV	in transit visibility
JFRG	joint force requirements generator
JITC	joint interoperability test command
JOPES	joint operation planning and execution system
JPMO	joint program management office
JTA	joint technical architecture
JTF	joint task force
KPP	key performance parameter
LHA	a general purpose amphibious assault ship
LOGMARS	logistics marking and reporting symbols
MACOM	major command
MAJCOM	major command
MEP	mobile electric power
MOPP	mission-oriented protective posture
MOS	military operational specialty
MSL	military shipping label
NADEP	naval aircraft depot
OMC	optical memory card
RF	radio frequency
RSO&I	reception, staging, onward movement and integration
SHADE	shared data environment
SIA	systems interface agreement
TCC	transportation component command
TCMD	transportation control and movement document

TCN	transportation control number
TDR	tonnage distribution roster
TMO	traffic management officer
TPFDD	time-phased force and deployment data
ULN	unit line number
UMO	unit movement officer
USTRANSCOM	united states transportation command

**Table A – Key Performance Parameter (KPP) Summary**

Key Performance Parameter	Threshold	Objective
<p><b>Joint Interoperability</b> All top level IERs will be satisfied</p>	<p>100% of the interface requirements identified as Threshold</p>	<p>100% of the interface requirements identified as Objective</p>
<p><b>Automatic Identification Technology</b> The system must have a capability to receive input from peripheral Automatic Identification Technology devices capable of reading from the AIT media listed in Table 1</p>	<p>The threshold values are stated in Table 1</p>	<p>The objective values are stated in Table 1</p>
<p><b>Data Automation</b> The system must be able to import, store, process, update and export operational data volume in support of Major Theater War deployment scenarios and traffic management operations</p>	<p>TC-AIMS II provides the ability for users to accomplish job-related tasks efficiently or as well as the best of breed of existing systems</p>	<p>Functional activities defined in this ORD will be automated in such a way as to reduce time required to perform those functions by at least 20 percent</p>
<p><b>Report Generation</b> TC-AIMS II must properly generate reports, forms, labels, tag data, OMC or Common Access Card data as listed in Table 3</p>	<p>The threshold values are stated in Table 3</p>	<p>The objective values are stated in Table 3</p>