ATP 4-16

Movement Control

APRIL 2022

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.
This publication supersedes ATP 4-16, dated 5 April 2013.

Headquarters, Department of the Army

Army Techniques Publication
No. 4-16

Headquarters
Department of the Army
Washington, D.C., 25 April 2022

Movement Control

Contents

*This publication supersedes ATP 4-16, dated 5 April 2013.

Figures

Tables

This page intentionally left blank.

Preface

ATP 4-16 describes the roles, responsibilities, and command relationships for organizations planning, executing, and supporting Army movement control at each echelon. Movement control applies to the range of military operations and supports ADP 3-0 and ADP 4-0.

The principal audience for ATP 4-16 is all members of the profession of arms. Commanders and staffs of Army headquarters serving as joint task force or multinational headquarters should also refer to applicable joint or multinational doctrine concerning the range of military operations and joint or multinational forces. Trainers and educators throughout the Army will also use this publication.

Commanders, staffs, and subordinates ensure that their decisions and actions comply with applicable United States, international, and in some cases host-nation laws and regulations. Commanders at all levels ensure that their Soldiers operate in accordance with the law of war and the rules of engagement (See FM 6-27/MCTP 11-10C).

ATP 4-16 uses joint terms where applicable. Selected joint and Army terms and definitions appear in both the glossary and the text. Terms for which ATP 4-16 is the proponent publication (the authority) are marked with an asterisk (*) in the glossary. Definitions for which ATP 4-16 is the proponent publication are boldfaced in the text. For other definitions shown in the text, the term is italicized and the number of the proponent publication follows the definition.

ATP 4-16 applies to the Active Army, Army National Guard/Army National Guard of the United States and United States Army Reserve unless otherwise stated.

The proponent of ATP 4-16 is the United States Army Combined Arms Support Command. The preparing agency is the Deployment Process Modernization Office, United States Army Combined Arms Support Command. Send comments and recommendations on DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) to Commander, United States Army Combined Arms Support Command, ATTN: ATCL-TDID (ATP 4-16), 2221 A Ave, Building 5020, Fort Lee, VA 23801-1809 or submit an electronic DA Form 2028 by email to: usarmy.lee.tradoc.mbx.leee-cascom-doctrine@mail.mil.

This page intentionally left blank.

Introduction

This revision of ATP 4-16 defines the movement control process and identifies the roles and responsibilities of organizations at the theater, corps, and division echelon in their support of large-scale combat operations. *Large-scale combat operations* are extensive joint combat operations in terms of scope and size of forces committed, conducted as a campaign aimed at achieving operational and strategic objectives (ADP 3-0). Movement control enables commanders at all levels to better execute the control of ground movements in support of large scale combat operations. Significant highlights of this revision include roles and functions of organizations performing movement control functions at the theater, corps and division echelon and the introduction of the theater movement control element that replaced the transportation theater opening element.

ATP 4-16 describes Army movement control as a process that is not confined to a single unit but executed by a tiered network of organizations that provide a method for commanders to influence movement over lines of communications in their operational area. The focus of this publication is on the theater sustainment command and its subordinate expeditionary sustainment commands, sustainment brigades, movement control battalions and movement control teams. This publication will also address the role of maneuver support organizations and staff augmentation elements responsible for synchronizing and integrating sustainment support at each echelon.

Though this ATP addresses general movement control techniques, the specific execution of missions are dependent on the situation or environment. ADP 3-0 indicates the following relevant insight. "An operational environment for any specific operation comprises more than the interacting variables that exist within a specific physical area. It also involves interconnected influences from the global or regional perspective (for example, politics and economics) that impact on conditions and operations there. Thus, each commander's operational environment is part of a higher echelon commander's operational environment." Consequently, ATP 4-16 provides a foundation for commanders to tailor the movement control process as necessary to meet the demands of any operational environment. The introductory table outlines new and modified terminology reflected in ATP 4-16.

Introductory table. New and modified Army terms

Terms	***Reasoning***
centralized control	ATP 4-16 is the proponent of the term. Modified for clarity.
committal authority	ATP 4-16 is the proponent of the term. Modified for clarity.
movement credit	ATP 4-16 is the proponent of the term.
positive inbound clearance	ATP 4-16 is the proponent of the term. Modified for clarity.
required delivery date	ATP 4-16 is the proponent of the term.
standing transportation movement release	ATP 4-16 is the proponent of the term. Modified for clarity.
transportation movement release	ATP 4-16 is the proponent of the term. Modified for clarity.

ATP 4-16 contains five chapters and six appendices:

Chapter 1 discusses the fundamentals of movement control and movement control support to Army strategic roles.

Chapter 2 discusses organizational roles and responsibilities conducting movement control at echelon.

Chapter 3 discusses the movement request process during large-scale combat operations.

Chapter 4 provides guidance to develop an integrated movement program.

Chapter 5 discusses route synchronization from planning to support of large-scale combat operations echelon.

Appendix A discusses allied and joint organizations and their support to movement control.

Appendix B discusses the transportation movement release process.

Appendix C discusses road movement planning.

Appendix D provides a sample route synchronization plan format.

Appendix E provides a sample route status table.

Appendix F discusses automation information systems related to movement control.

Chapter 1

Fundamentals of Movement Control

The transportation system is metered by the demand signals of the supported forces. Movement control balances requirements against capabilities and integrates military, host nation (HN) and commercial transportation by all modes to ensure seamless transitions from the operational to the tactical level of operations. Movement control, as a transportation subordinate function, provides commanders a mechanism to synchronize movements for deployment, redeployment, and distribution operations to support large-scale combat operations. Not vested in a singular unit, movement control responsibilities are embedded in a network that relies on coordination for planning and execution to ensure transportation assets are utilized efficiently and the lines of communications (LOC) are deconflicted. This chapter discusses the fundamentals of movement control.

COMPONENTS OF MOVEMENT CONTROL

1-1. *Movement control* is the dual process of committing allocated transportation assets and regulating movements according to command priorities to synchronize the distribution flow over lines of communications to sustain land forces (ADP 4-0). Movement control functions are informed by its principles and the concept of dual process. Dual process provides the framework for synchronizing the flow. The flow is defined as the strategic, operational, and tactical movement of forces or sustainment cargo. Synchronizing includes the ability to increase or decrease the speed, impact the direction, or adjust the volume of the flow over air, land, or water lines of communication with members of the joint logistics enterprise, supported and supporting units, and HNs. Distribution is about getting the "right things" to the "right place" at the "right time". Movement control as a means of distribution synchronizes the flow to ensure the two segments of distribution are accomplished.

PRINCIPLES OF MOVEMENT CONTROL

1-2. The principles of movement control include centralized control and decentralized execution, fluid and flexible movements, effective use of assets and carrying capacity, and forward support. For movement control to be successful in meeting the commander's intent in accordance with operational priorities, movement control principles must be considered in the execution of operations.

CENTRALIZED CONTROL AND DECENTRALIZED EXECUTION

1-3. ***Centralized control* is a focal point for transportation planning and resource allocation at the appropriate integrated logistics support level to manage current and future requirements of the supported force.** The organization is normally a sustainment headquarters with the staff capability and capacity to balance requirements against capabilities in accordance with priority of support. Decentralized execution of movement control operations is essential to establish mode determination during the movement request process at the lowest level possible. This allows mode operators the capability to assign specific transportation assets that will meet the requirement. Decentralized execution enhances the flexibility to prioritize support to meet the commander’s intent.

FLUID AND FLEXIBLE MOVEMENT

1-4. Movement control is responsible for providing uninterrupted flow of movement over LOCs such as road, rail, air, and inland waterway, and relies heavily on information and communications systems

embedded in the distribution system to enhance capabilities. The assurance of an uninterrupted flow of movement is essential to operational success. To do this, the system must be capable of maintaining flexibility by rerouting and diverting traffic. Maintaining flexibility is one of the biggest challenges facing movement planners and operators in a changing operational environment with shifting conditions and priorities.

EFFECTIVE USE OF CARRYING CAPACITY

1-5. The effective use of carrying capacity contains two elements that are necessary to understand the relationship to movement control. The first aspect is the load carrying limits or transport capabilities of the piece of equipment (truck, trailer, or rail car) needed to move supplies or other equipment. Understanding the limits and capabilities when fully loaded with compatible classes of supplies and equipment enables effective planning during support of strategic and operational objectives. Unlike bulk fuel which can be stored for future use, transport capabilities cannot be stored to provide an increase in capability for subsequent days. Understanding the capacity of LOCs, to include limitations on traffic or weight, height, or depth restrictions, is essential to support freedom of movement for all modes of transport capabilities.

1-6. The second aspect of effective use of carrying capacity is the management and use of assets during operations. The use of transport capabilities requires management based on the carrying capacity so that assets are returned or reconfigured for prompt use. An example is the use and return of commercial transportation assets (20 and 40 foot containers). Without prompt return to the vendor, additional costs or penalty charges may be levied against the government. This includes the disciplined use of returning transportation assets to support retrograde or repositioning of equipment, personnel, and supplies. Also included in the effective use of carrying capacity is the fast off-loading of assets to increase capability for later operations. Planners must temper this principle with appropriate attention to adequate equipment maintenance and crew rest.

FORWARD SUPPORT

1-7. The principle of forward support facilitates the rapid delivery of sustainment as far forward as possible with minimal handling and transshipping. It is dependent on fast, reliable transportation to move supplies and personnel as far forward as the mission requires or operational environment permits, whichever is more expeditious or adequate. The key to forward support is rapid reception and clearance at destination units. It is frequently necessary to temporarily augment destination units' reception and clearance capabilities to ensure operational success, but this principle must be balanced to also ensure all levels have the appropriate resources to remain effective.

DUAL PROCESS

1-8. Dual process is the core of movement control and is the overarching mechanism to physically influence movement by committing transportation assets and regulating movements based on priorities. Committing allocated transportation assets is the umbrella process capturing the various sub processes that match a transportation movement requirement against transportation capabilities. It encompasses—

- The Army Service component commander as the authority that defines mode-operator's ability to commit common-user transportation, including, but not limited to, truck, fixed or rotary wing assets.
- Mode operators managing the designated common-user transportation fleet.
- The movement request process and the resulting transportation movement release (TMR). **The *transportation movement release* is a document that assigns a transportation capability to a movement requirement and provides the movement details** (see appendix B)**.**
- Committal authority of movement control units.
- Tasking authority of mode operators.
- The validation of a movement program.

1-9. The dual process uses such actions as selecting the mode of transport and determining departure times as mechanisms to synchronize flow. Determining the appropriate mode of transport can increase the speed

(for example, selecting air versus ground) or adjust the volume (for example, using multiple modes to increase the capacity of LOCs).

1-10. Regulating movements involves additional actions to synchronize the flow of movement over LOCs, which includes, but is not limited to, the planning and execution of route synchronization (see chapter 5) and distribution network design (see chapter 2). It also includes managing convoys at distribution hubs, convoy support centers, border crossings, and entry control points, and diverting movement of a convoy or single shipment, when necessary.

FUNCTIONS OF MOVEMENT CONTROL

1-11. The functions of movement control are planning, allocating, routing, coordinating, and in-transit visibility (ITV). See figure 1-1 on page 1-4 for a graphic depiction of the complementing functions of movement control.

Planning

1-12. Transportation planning involves identifying and consolidating known requirements and anticipating the unknown requirements. It demands flexibility to anticipate events, accommodate change, the ability to understand the operational environment, and concept of operations. The ability to anticipate events and requirements allows the planners to initiate necessary actions to appropriately avoid or resolve an issue before affecting current or future operations. For transportation planners, anticipation includes developing alternative plans for routes and loss of assets due to enemy action. Transportation planners must also understand the distribution network and develop a distribution plan that includes road networks, and location of customer activities. Other important factors to understand include frequency and magnitude of their transportation requirements, and their materiel and container-handling capabilities. The distribution network design is a graphic representation of the road network main supply route (MSR) or alternate supply route (ASR) as well as control measures such as direction of traffic, check points (CPs), halt points, barriers, and other identifiers that describe obstructions and warnings. Major distribution nodes such as air, rail, or water terminals, supply support activities, or theater distribution centers should be depicted as well.

Allocating

1-13. Allocating involves the assignment of common user transportation capability against planned movement requirements. Allocating common-user transportation requires planners to review and adjust available capabilities to maximize support during all phases of an operation.

Routing

1-14. Routing is the process of scheduling and directing movements on LOCs to prevent conflict and congestion. When routing traffic, movement planners should—

- Consider the enemy situation.
- Consider the LOC condition.
- Assign highest priority traffic to routes that provide the minimum time-distance.
- Consider the sustained capabilities of roads and bridges when assigning movements.
- Separate motor movements from pedestrian movements.
- Separate civilian traffic (vehicular or pedestrian) from military movements.
- Consider consolidating shipments that can be applied to a selected route.

Coordinating

1-15. Coordination may involve, but is not limited to, planners from joint and multinational forces, strategic partners, HNs, contractors, and nongovernmental organizations. Coordination may also involve land owners or other Army forces when crossing boundaries to access road networks or security assistance. A common communication network is vital to this process. See appendix F of this publication for a list of movement control and related automation information systems that may be used as part of a common communication network.

In-transit visibility

1-16. An ITV capability facilitates the ability to track the identity, status, and location of Department of Defense (DOD) units, non-unit cargo (excluding bulk petroleum, oils, and lubricants), passengers, patients, and personal property from origin to consignee or destination across the range of military operations (JP 4-01). ITV is a critical component of transportation operations and should be addressed when developing a movement control strategy. See AR 700-80 for policy requirements.

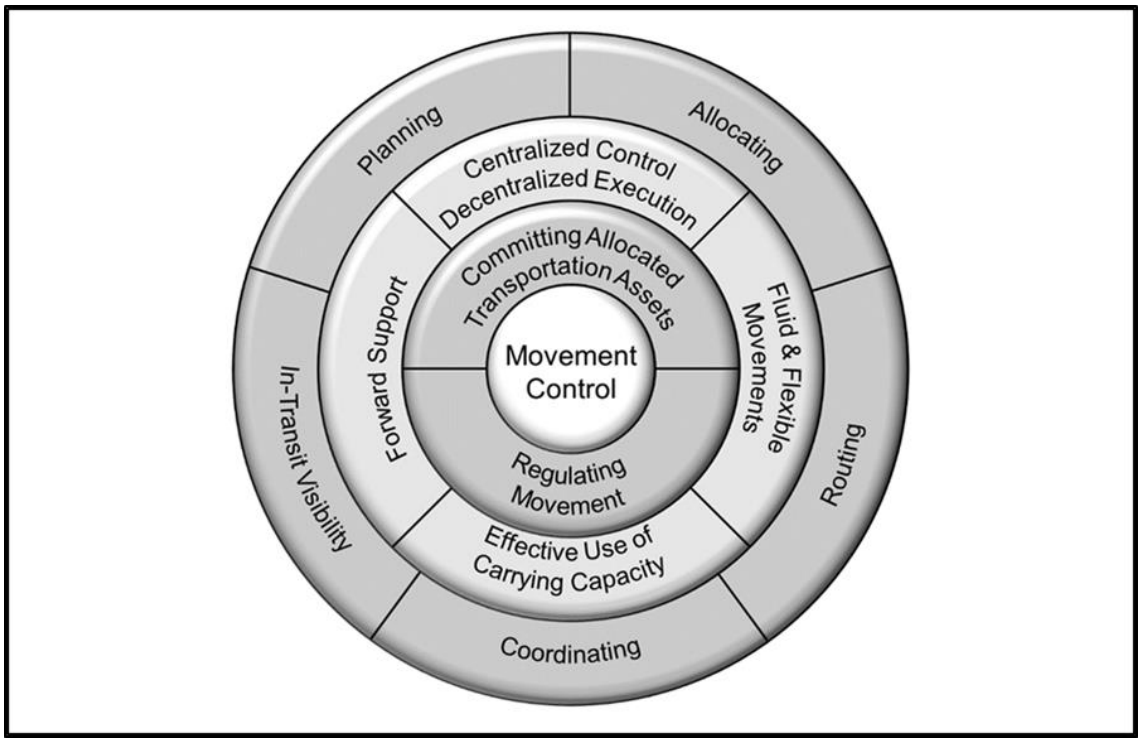

Figure 1-1. Functions of movement control

ARMY OPERATIONS

1-17. Unified land operations support the four strategic roles that nest with and contribute to the joint phases of operations. The Army's primary mission is to organize, train, and equip its forces to conduct prompt and sustained land combat to defeat enemy ground forces and seize, occupy, and defend land areas. The Army accomplishes its mission by supporting the joint force in four strategic roles: shape operational environments, prevent conflict, prevail during large-scale combat operations, and consolidate gains. Throughout the four phases of operations, there are continual global and theater shaping activities occurring simultaneously. Additionally, phases of operations are not necessarily sequential. Although the phases may follow each other in some instances during a specific campaign, phases may occur in any order or concurrently.

SHAPE OPERATIONAL ENVIRONMENTS

1-18. Shaping activities help set conditions for successful theater operations. Shaping may be as simple as military leaders engaging counterparts from other militaries or more complex as a large-scale multinational training exercise. Shape activities are generally conducted as part of military engagement and security cooperation. They dissuade or deter adversaries, assure allies, and set conditions for contingency plans. The goal is to promote regional stability, build partner capacity, and dissuade adversaries from activities to disrupt the peace.

1-19. During the shaping phase, movement control can support the theater by coordinating efforts during route security measures and coordinating distribution activities throughout stability operations. Additionally,

movement control can include planning, routing, and scheduling movement of equipment and personnel from their forward-deployed stations to training sites or other contingency operations.

PREVENT CONFLICT

1-20. As adversaries make overt threats towards military confrontation, the Army will counter those actions with overt actions in order to prevent conflict. Prevent operations are conducted in response to activities that threaten unified action partners and require the deployment or repositioning of credible forces in a theater to demonstrate the willingness to fight if deterrence fails. Activities include mobilizations, other pre-deployment activities, and forward stationing of assets to protect existing facilities as well as improve information collection.

1-21. During the prevent phase, movement control operations support reception, staging, onward movement, and integration (RSOI) operations. This includes planning, routing and scheduling movements and repositioning of unit equipment, personnel, and supplies through multiple access points, including degraded and austere environments.

PREVAIL IN LARGE-SCALE COMBAT

1-22. Prevailing in large-scale combat requires the Army to defeat and destroy its adversaries. Large-scale combat operations seek decisive advantage by using all domains and available elements of combat power to exploit the initiative, deny enemy objectives, defeat enemy capabilities to resist, and compel desired behavior. This takes executing combat through multiple domains simultaneously to exploit the adversaries weaknesses. Ultimately, combat will not end until the adversaries lose their will to fight and the Army with its unified action partners can consolidate their gains from operations.

1-23. During support to large-scale combat, movement control supports conflict resolution by planning, routing, and scheduling movements through multiple access points, including degraded and austere environments. Movement control also provides ITV during the development of combat power aiding in the coordination of combat capability to defeat the enemy.

CONSOLIDATE GAINS

1-24. Consolidating gains is an ongoing effort throughout combat operations. Army forces conduct a combination of offensive, defensive, and stability operations to successfully consolidate gains. Consolidation of gains is an integral and continuous part of armed conflict, and it is necessary for achieving success across the range of military operations. Army forces deliberately plan to consolidate gains during all phases of an operation. While Army forces consolidate gains throughout an operation, consolidating gains becomes a primary focus when large-scale combat operations are no longer occurring. These activities consist of security and stability tasks and will likely involve combat operations against bypassed enemy forces and remnants of defeated enemy units. Therefore, units may initially conduct only minimal essential stability tasks and then transition into a more deliberate execution of stability tasks as the primary mission as the overall security improves. As forces remove adversaries from areas, those same forces or others come in and start to stabilize, rebuild, and establish a process to return those areas to local governance.

1-25. During support to consolidation of gains, movement control enables coordination during repositioning of unit equipment, personnel, and sustainment to aid in security and stability operations.

MOVEMENT CONTROL IN SUPPORT OF MULTI-DOMAIN OPERATIONS

1-26. The competition continuum describes an environment of enduring competition characterized by a mixture of cooperation, competition below armed conflict, and armed conflict. Within the competition continuum, movement control activities must be prepared to operate across the range of military operations. Movement control provides the ability to synchronize the distribution of sustainment, allocate transportation assets and manage LOCs needed to support friendly forces. Since many friendly capabilities are not organic to sustainment formations, commanders and staffs plan, coordinate for, and integrate joint and other unified action partner capabilities in a multi-domain approach to operations. Movement control supports other

Services, nations, governmental and nongovernmental organizations in the employment of forces or sustainment throughout a theater area of responsibility (AOR).

1-27. During large-scale combat, peer threats deploy capabilities across multiple domains to attack United States (U.S.) vulnerabilities and disrupt sustainment operations. Due to the varied impacts of enemy activities during multi-domain operations, movement control activities must prepare to operate in denied, disrupted or compromised environments. They should also maintain the capability to provide redundant and alternate methods of executing movement control and reporting movement activities. These methods include telephone, radio transmission, and hard copy documentation. Movement control activities should also plan alternate LOCs and contingency methods of movement and support to counter any impacts from enemy forces to air, land, or maritime operations.

Chapter 2

Organizational Roles at Echelon

Army organizations have specific roles and responsibilities when conducting movement control operations. This chapter discusses organizations employed at the theater, corps and division echelons and their roles and responsibilities at each level.

ARMY SERVICE COMPONENT COMMAND

2-1. The Army Service component command (ASCC) commander is specifically responsible for service-related Title 10, United States Code tasks to prepare, train, equip, administer, and provide supplies and services to Army forces assigned or attached to combatant commands. The ASCC may also have many lead service responsibilities, which involve common-user logistics support to other services, multinational forces, other government agencies, or nongovernmental organizations.

SET THE THEATER

2-2. Theater opening is an initial step in setting the theater. *Theater opening* is the ability to establish and operate ports of debarkation (air, sea, and rail), to establish a distribution system and sustainment bases, and to facilitate port throughput for the reception, staging, onward movement and integration of forces within a theater of operations (ADP 4-0). During large-scale combat, opening the theater should be addressed early in the planning process due to the scope of operations and to mitigate any restrictions during RSOI. Movement control operations play an integral part in these actions through the allocation, integration, and synchronization of assets at echelon. For more information on theater opening, see ATP 4-94.

2-3. Setting the theater is a continuous shaping activity and is conducted as part of steady-state posture and for contingency or crisis response operations. Set the theater describes the broad range of actions conducted to establish the conditions in an operational area for the execution of strategic plans. The combatant commander (CCDR) has overall responsibility for this activity, but executes many responsibilities through the theater sustainment command (TSC) or the ASCC. The purpose of setting a theater is to establish favorable conditions for the rapid execution of military operations and to support requirements during large-scale combat operations or specific operation plans (OPLANs) during crisis or conflict.

THEATER OPENING

2-4. The ASCC conducts theater opening and is responsible for RSOI of Army forces. Sustainment support to setting the theater in operations to shape involves theater opening, receiving initial forces, equipment, and supplies and assembling them into mission-tailored units, and transporting them to their final destination. The broad range of setting the theater activities also includes synchronization and integration of sustainment through the establishment of boards, bureaus, centers, cells, and working groups.

2-5. At the theater level, centralized movement control coordinates the flow of units, personnel, and materiel (including sustainment) into the theater and onward to forward destinations. These actions are vital for processing deploying units and sustaining them in theater. The ASCC headquarters provides command and staff supervision of movement control units through the assigned TSC. The TSC establishes LOCs in the theater. LOC components include facilities required to move, maintain, and sustain Army forces in the theater. In order to create an intermodal distribution network, LOC components consist of—

- Aerial ports of embarkation and debarkation.
- Seaports of embarkation and debarkation.
- Water, rail, and route networks.
- HN resources.

THEATER SUSTAINMENT COMMAND

2-6. The TSC is the Army's command for the integration and synchronization of sustainment in the AOR. The TSC is the link between the strategic and operational levels. The command is a theater-committed asset to each ASCC and focuses on Title 10 support of Army forces for theater security cooperation and the CCDR's daily operational requirements. The TSC task organization may include a theater movement control element (TMCE), one or more expeditionary sustainment commands (ESCs), sustainment brigades, and a transportation brigade expeditionary. For more information see FM 4-0.

2-7. In the absence of a TSC or during the early stages of an operation, an ESC can fulfill the TSC role. The deployment echelon, location, and the command and support relationships will determine the TSC and ESC planning and operational horizons. The TSC is responsible for plans and policies for movement control at the theater echelon, and the ESC is responsible for current and near term operations. The TSC distribution management center (DMC) comprises six subordinate branches: distribution integration, materiel management (supply, munitions, field services, and maintenance sections), operational contract support (OCS), a sustainment automation management office section, fuel and water branch, and transportation operations. The branches coordinate the integration for distribution and movement control of units, supplies, and materiel into, within, and out of the theater of operations. The DMC transportation operations branch is responsible for developing the theater movement program and conducting route synchronizations. The branch plans, coordinates, and synchronizes inland surface, sea, and air transportation capabilities for the command, and may be required to—

- Manage theater route synchronization to include common theater routes between movement control battalions (MCBs).
- Supervise movement's portion in support of OPLANS.
- Provide supplemental modal movement management for personnel and materiel, except bulk class III by pipeline, within, into, or out of theater.
- Manage U.S. and HN transportation assets identified as common user. Also, provides theater level liaison to HNs and for contracted assets.
- Serve as container, flat rack, and air pallet manager and coordinate all aspects of intermodal container use.
- Manage container operations from synchronizing support to retrograde operations with priority being return of International Organization for Standardization shipping containers, aerial delivery platforms, and flat racks, not unit owned to the distribution system.
- Optimize intra-theater multimodal distribution.
- Manage transportation flow capability by maintaining visibility of resources that are being transshipped at or transiting the nodes.
- Develop the movement program, when required for the theater echelon.
- Conduct direct liaison with the theater joint deployment and distribution operations center (JDDOC), HN and contracted transportation assets.
- Coordinate with MCBs and sustainment brigades to management and synchronize movements.
- Conduct route synchronization at the theater echelon.
- Coordinate country clearance procedures with ASCC and CCDR.
- Establish an ITV gateway network.
- Provide a contracting officer representative for transportation functions, as needed.

2-8. The distribution plans and integration branch within the TSC DMC is responsible for planning and coordinating theater distribution operations for the command. The branch is responsible for developing the theater distribution plan and executing the distribution integration process for the command. The distribution and integration branch can also—

- Recommend site selection for transportation activities centralized receiving and shipping points, air terminals, railheads, and inland waterway terminals.
- Establish country clearance procedures for subordinate units.
- Coordinate with other DMC branches to determine movement requirements for their commodities to incorporate into the movement program.

- Enforce priorities for air, water and land transportation (both road and rail) established by the ASCC and supported CCDR.
- Provide movement planning for strategic deployment, sustainment, and redeployment.
- Prepare movement and port clearance plans and programs, including reception and onward movement.

2-9. To increase movement control operational efficiency within the theater, the TSC may decide to divide the theater or an operational area into transportation movement regions, with an MCB per region. This method permits centralized control and decentralized execution of movement control functions by subordinate MCBs. This method requires synchronization by the TSC with the movement regions concerning intermodal operations to ensure container management policies are enforced and visibility of containers is managed throughout execution of distribution operations. Adherence to TSC policies will ensure adequate numbers of containers are available to support intermodal operational requirements. For additional information, see ATP 3-93, ATP 4-93, and FM 4-0.

THEATER MOVEMENT CONTROL ELEMENT

2-10. The TMCE provides movement management, container management, highway regulation and coordination for personnel and materiel movements into, within, and out of the theater for the theater Army or joint force commander. The TMCE is assigned to a TSC DMC, normally augmenting the transportation operations branch and on order, can further provide personnel to the ESC DMC, when support requirements exceed the ESC DMC's capabilities. The TMCE can also provide staff augmentation to the sustainment brigade support operations (SPO) section for select theater opening operations that set and support the theater by inter and intra-theater distribution requirements.

2-11. To set the theater in support of the CCDR's theater strategy, the TMCE plans efforts and collaborates with transportation boards, liaisons between strategic transportation partners to identify strategic ports of entry into the CCDR's AOR, assists the CCDR in establishing agreements for their use of ports of entry and their usage. This critical role enables the facilitation and coordination with strategic transportation necessities between the CCDR and strategic partners, such as United Stated Transportation Command (USTRANSCOM), Defense Logistics Agency, and United States Army Materiel Command.

2-12. To support the theater, the TMCE plans, implements, and monitors intra-theater movements programs committing transportation ground and air assets in support of RSOI operations. It can serve as the theater container control officer, or lead and serve on movement boards. The TMCE is organized into four branches: movement control division, intra-theater operation branch, inter-theater operations branch, and the theater container branch.

MOVEMENT CONTROL DIVISION

2-13. The TMCE movement control division provides command and control, administration, logistics and supervision of the operational functions of the organization in the performance of mission tasks, and other movement requirements not covered by regulatory guidance. The movement control division can also serve as a liaison officer to the JDDOC. (See appendix A for more information on JDDOC.)

INTRA-THEATER OPERATIONS BRANCH

2-14. The TMCE intra-theater operations branch plans, implements and monitors intra-theater movements programs and commits transportation ground and air assets in support of RSOI operations. The intra-theater operations branch can also perform the following functions:

- Conduct transportation planning.
- Plan support for contingency operations.
- Conduct exceptional movement requirements.
- Provide personnel requirements not covered by regulatory guidance.

INTER-THEATER OPERATIONS BRANCH

2-15. The TMCE inter-theater operations branch plans, implements, monitors, and coordinates inter-theater movements programs. The inter-theater operations branch can also operate as a liaison element between strategic transportation partners and the TSC or ESC. Additionally, the inter-theater branch can perform the following functions:

- Provides representation on inter-theater transportation coordination boards and meetings.
- Conducts transportation planning.
- Plans support for contingency operations.
- Coordinates exceptional movement requirements.
- Manages other movement requirements not covered by regulatory guidance.

THEATER CONTAINER MANAGEMENT BRANCH

2-16. The TMCE theater container management branch implements and monitors theater container movement, container accountability programs, and container management processes. This branch can work as an in theater liaison for Military Surface Deployment and Distribution Command (SDDC) container managers. The theater container management branch can also perform the following functions:

- Conduct container transportation planning.
- Plan support for contingency operations.
- Conduct exceptional movement requirements.
- Serve as theater container control officer.
- Provide other personnel requirements not covered by regulatory guidance.

CORPS

2-17. A corps is normally the senior Army headquarters deployed to a joint operations area. During large-scale combat operations a corps headquarters may be required to function as a tactical land headquarters under a joint or multinational land component command. Its headquarters is organized, trained, and equipped to control the operations of two to five divisions, together with supporting theater-level organizations. See FM 3-94 for additional information. The corps is responsible through the theater Army commander for the Service-specific support of all Army forces in the joint operations area.

2-18. The corps transportation officer (CTO) is the primary technical advisor to the corps commander on transportation policy, mode operations, movement execution, ITV, and transportation automation systems. Responsibilities may include support of reception and onward movement of forces, replacement operations, and retrograde. The CTO also assesses the overall effectiveness of the corps movement programs. Other CTO duties may include—

- Coordinate deployment and redeployment of forces with the corps assistant chief of staff, operations (G-3).
- Coordinate tactical relocation of forces with the corps G-3.
- Establish procedures for movements that cross boundaries. Receives and analyzes route statuses for corps MSRs and ASRs.
- Plan transportation support, develop policies, provide guidance, and recommend movement priorities and procedures for movement control and route synchronization.
- Plan, coordinate, and oversee large or special movements in conjunction with the TSC or ESC.
- Prepare, in coordination with the TSC or theater-level ESC, the transportation portion of concept of sustainment and orders.
- Recommend road repair priorities and improvements for the road network, in the corps area, in coordination with the corps G-3 and engineers.
- Coordinate with the G-3, TSC or ESC, and the military police on the distribution network design and route synchronization plans.

- Coordinate with the assistant chief of staff, civil affairs operations (G-9), TSC or ESC and maneuver enhancement brigade (MEB) civil affairs task force for the movement of displaced civilians.
- Assess and recommend requirements for HN support.
- Coordinate with the battalion or brigade civil affairs operations staff officer or G-9 of the regional support group or area support group for HN support.

2-19. The CTO may also coordinate with a civil affairs task force within the AOR to assist in establishing military-to-civilian links for the utilization of road networks. Civil affairs task forces are temporarily task-organized formations sourced from Army units and assigned to a theater Army, corps, division, or brigade combat team (BCT). (See FM 3-57 for more information on civil affairs task forces.)

EXPEDITIONARY SUSTAINMENT COMMAND

2-20. When an ESC is assigned at the corps echelon, it is the controlling headquarters for the integration and synchronization of sustainment operations. The ESC staff supports the corps staff in sustainment planning and task organization of sustainment capabilities. The ESC is the link between the operational and tactical levels in a designated operational area. The ESC task organization can include sustainment brigades, transportation brigade expeditionary, and MCBs depending on the mission and requirements in the AOR.

2-21. The ESC executes plans and policies for movement control in a designated operational area. The ESC DMC Transportation Operations Branch may serve as the executive agent for movement control operations for a joint task force. The DMC transportation operations branch is responsible for executing plans, policies, and staff supervision of movement control operations in a designated operational area. Specific responsibilities include—

- Coordinate in the development of the movement program for a designated operational area.
- Conduct route synchronization planning in the designated operational area.
- Coordinate country clearance procedures with ASCC and CCDR for the designated operational area.
- Establish and operate ITV gateway network in the designated operational area.
- Provide transportation common operating picture to CCDR.

SUSTAINMENT BRIGADE

2-22. The sustainment brigade provides command and control for sustainment organizations and conducts support operations at the theater echelon. The brigade is assigned to the ASCC and attached to the TSC or ESC. Depending on the operation, the task organization of the brigade could include multiple combat sustainment support battalions and a motor transport battalion. When serving as the senior sustainment command, the brigade may also be assigned an MCB.

2-23. The SPO staff section of the sustainment brigade is responsible for planning, coordinating, and synchronizing sustainment operations for all units within the supported force. The SPO develops and executes the distribution management and movement processes that include materiel management (supply, field services, fuel and water, munitions, and maintenance management), distribution integration, and transportation operations functions. The SPO transportation operations branch controls the execution of transportation operations (mode and terminal) functions. The SPO transportation operations branch also coordinates transportation requirements for supported units and synchronizes movements with movement control teams (MCTs). Specific responsibilities include—

- Balance transportation capabilities against requirements.
- Coordinate with the brigade operations officer (S-3) to task subordinate common user transportation assets.
- Manage TMRs sent from the MCB.
- Provide common-user transportation capabilities and movement reports to TSC, ESC, supporting MCB, or MCT.
- Assist in the development of the movement plan.

- Monitor transportation node capability and capacity.
- Coordinate for protection for transportation operations.
- Preposition and array transportation assets across the operational environment to meet demand.
- Attend theater, corps, and division-level movement boards.
- Establish brigade movement boards as needed when serving as the senior sustainment command.

TRANSPORTATION BRIGADE EXPEDITIONARY

2-24. The transportation brigade expeditionary provides command and control for up to seven terminal battalions (when fully deployed) in support of intermodal operations consisting of port opening and operation of inland waterways, bare-beach, and degraded and improved seaports, and conducts deployment, re-deployment, and distribution operations in support of unified land operations. The transportation brigade expeditionary is capable of the following—

- Planning and management of watercraft and water terminal support for a theater of operations.
- Control of port opening operations. These operations include receiving, loading, discharging, staging, maintaining control and ITV, and releasing equipment and materiel to the receiving unit or command.
- Terminal and logistics over-the-shore site infrastructure assessment.
- Army early entry logistics over-the-shore planning, management, execution, and Army support to joint logistics over-the-shore operations.
- Monitoring and coordination of water terminal and watercraft operations in theater.
- Planning and executing deployment of assigned units to contingency or redeployment operations.

MOVEMENT CONTROL BATTALION

2-25. The MCB is normally attached to an ESC headquarters. When a sustainment brigade is designated as the senior sustainment command for an operation (for example, a contingency operation), an MCB may be task organized under a sustainment brigade. To decentralize execution of movement control functions, the ESC may divide the operational area into transportation movement regions, each with a separate MCB. The MCB is the principal organization with responsibility to coordinate and synchronize the execution of movement control to ensure effective and efficient movements. The MCB provides command and control over multiple MCTs spread throughout its area of operation. Together, the MCB and subordinate MCTs link movement control operations from the strategic to the tactical level in a theater of operation. This linkage enables the ability to synchronize actions that involve the movement of forces, equipment, materiel, cargo, and sustainment over LOCs within the MCB's operational area. Under certain conditions, the senior Army sustainment headquarters may assign the MCB an inland cargo transfer company (ICTC), to oversee material handling operations and the management of intermodal transfer points.

2-26. During operations, the MCB and MCTs provide transportation asset visibility, coordination for the use of common-user transportation assets, and provide ITV of unit moves during RSOI, deployment, redeployment, and distribution operations. (See ATP 3-35 for more information on Army deployment and redeployment operations.) The MCB coordinates with HN authorities for cargo transfer locations, road clearances, border (land gateway) clearances, escort support, and any additional transportation support. Coordination with the HN enables the MCB to provide oversight of Army theater common-user transportation and for regulating Army movement on theater controlled MSRs and ASRs.

ORGANIZATION

2-27. The MCB staff provides limited administrative and logistical support for the battalion and attached MCTs. To support operations, the S-3 staff supervises actions of two sections; the highway traffic section and the plans, programs, and operations section. See figure 2-1 depicting the staff structure for the MCB.

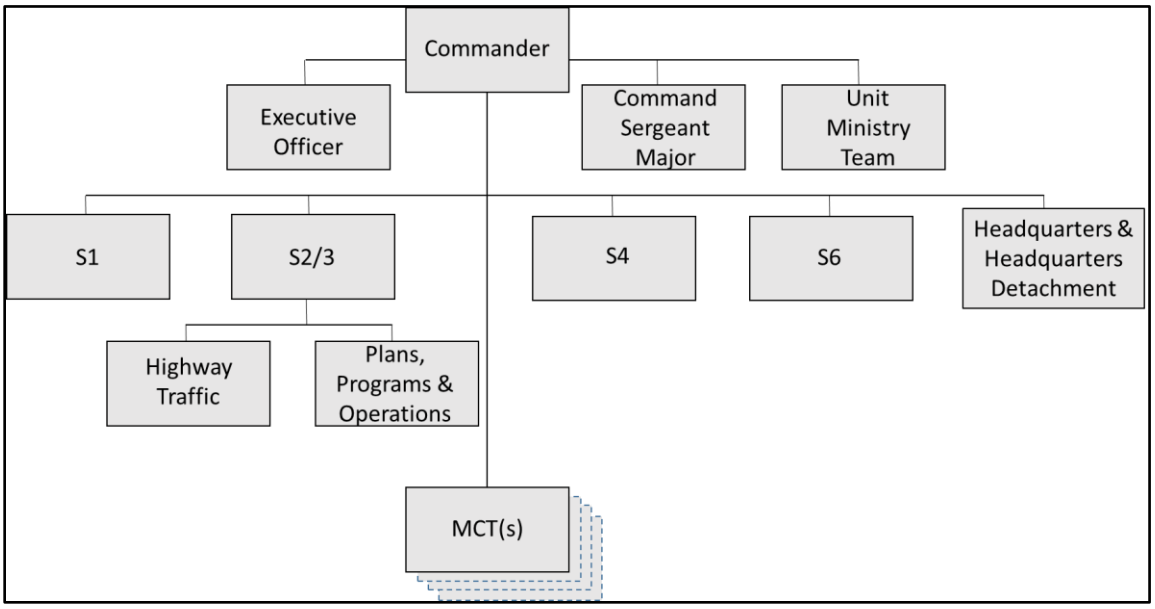

Figure 2-1. Movement control battalion organization

2-28. The plans, programs, and operations section of the MCB is responsible for surface, air, rail, Army watercraft movements, and assisting with container management. When other Services, theater-level units, or agencies (such as Air Force, Army watercraft, or SDDC) are attached to support theater movement control operations their liaison officer will operate in the plans, programs, and operations section. This section coordinates support and maintains the availability status of transportation assets throughout the MCB's operational area. The responsibilities of the plans, programs, and operations section include—

- Assist in the development and implementation of a theater movement program.
- Coordinate with TSC or ESC DMC for movement requirements.
- Coordinate and monitor boundary crossings.
- Plan support for reception and onward movement.
- Assess and recommends support requirements for intermodal operations.

2-29. The highway traffic section of the MCB is responsible for conducting route synchronization for the theater echelon or designated operational area. The highway traffic section coordinates with the TSC or ESC, sustainment brigades, operational land owners, CTO or division transportation officer (DTO), and HN authorities for any movements that originate in its area. To manage route usage, the highway traffic section issues movement credits. **A *movement credit* is an allocation granted to one or more vehicles in order to move over a controlled route in a fixed time according to movement instructions**. Additional responsibilities could include—

- Develop route synchronization plans incorporated with movement clearance and other security measures.
- Provide transportation route overlays and the distribution network design to support OPLANS.
- Collect, process, and distribute route status.
- Coordinate enforcement of route synchronization plan.
- Track convoy movements and provide route overlays.

DISTRIBUTION NETWORK

2-30. The distribution network design is a graphic representation of the road network (MSR or ASR), as well as control measures such as direction of traffic, CPs, release points (RPs), barriers, and other identifiers that describe obstructions and warnings (see figure 2-2 on page 2-8). Major distribution nodes such as air, rail, or water terminals, supply support activities, or theater distribution centers should be depicted as well.

MOVEMENT CONTROL TEAM

2-31. MCTs are used to decentralize the execution of movement responsibilities on an area basis or at key transportation nodes (see JP 4-09 for more information). An MCT is attached to a MCB and can execute five missions: (1) intermodal (2) area (3) movement regulation (4) cargo documentation and (5) division support. An MCT comprises 21 personnel and can be split into as many as four sub-units to support four separate locations, each providing a different aspect of movement control. When an MCT is geographically separated from one of its elements but retains command and control, the separate element is referred to as a branch MCT. The designation of an MCT or MCT (-) denotes the unit is employed with significantly fewer personnel but retains its direct command and control trace to the MCB.

Figure 2-2. Distribution network design

INTERMODAL

2-32. An MCT can be positioned at an air, rail, or water terminal within the theater to coordinate clearance of personnel and cargo. The MCT conducting the intermodal mission coordinates transportation requirements for movement of units as they arrive in theater supporting RSOI and can assist units during redeployment in preparing their equipment for strategic transport. (See ATP 4-13 for more information on Army intermodal operations.) An MCT performing an intermodal mission in conjunction with elements of an ICTC forms the basis for an arrival/departure airfield control group at an air terminal, and this combination provides similar capability as the joint task force-port opening. Additionally, an MCT combined with elements of an ICTC can provide the necessary support at a rail terminal. Terminal responsibilities of an MCT include—

- Ensure shipment of prioritized cargo, designated by movement programs or other directives.
- Receive and validate movement requests and coordinate transportation.
- Positive inbound clearance of cargo through the destination MCT.
- Ensure packing, marking and documentation procedures, including international requirements are compliant.
- Marshall convoys.
- Maintain ITV of personnel and cargo transitioning the terminal.
- Assist arriving personnel through customs at air, rail, and seaports of entry.
- Ensure cargo is properly marked and containers have functioning radio frequency identification tags.

- Prepare passenger manifest and load plans.
- Assist with container and pallet management. For more information see ATP 4-12.

AREA

2-33. An MCT, performing an area mission, coordinates transportation support for units in a designated operational area. Transportation support includes Army common user transportation assets to include motor transport, rail, watercraft, and rotary/fixed wing. The MCT may have the authority to arrange HN and commercial transportation similar to the above mentioned to include buses, container handling equipment (CHE), and materials handling equipment (MHE). In performing an area mission, the MCT customer base can include, but is not limited to, the sustainment brigade, medical units, engineers, military police, separate brigades, and non-divisional maneuver and maneuver support units. Additional responsibilities of an MCT performing an area mission can include—

- Validate movement requirements for consideration by a movement board.
- Coordinate transportation movements, diversions, and transfer of unit cargo and personnel.
- Coordinate for common-user transportation assets or with sustainment units to assist in the movement of sustainment supplies.
- Provide ITV of unit equipment and sustainment movements.
- Process convoy clearance and coordinate cross boundary movements.
- Positive inbound clearance of cargo through the destination MCT.
- Function as the installation transportation officer when employed to support redeployment operations.

2-34. The MCT can also perform the duties of the unit movement coordinator when deployed and provide transportation services for units in its operational area to support redeployment. Those services can include assisting in the preparation of shipping documents for unit cargo, deployment automation management, and processing unit movement data.

MOVEMENT REGULATION

2-35. An MCT might be placed at various locations to assist in managing the flow on MSRs or ASRs. The MCT can provide a first destination reporting point at border crossings and boundaries to manage the flow of military or commercial movement entering a unit's operational area, stage convoys, and ensure movement schedules are adhered to at convoy support centers or distribution hubs. MCTs performing a movement regulation mission can also have responsibilities to provide visibility of incoming and outgoing convoy movements at hubs. Additional responsibilities can include—

- Observe, assess and report progress of tactical and non-tactical movements along MSRs and ASRs.
- Coordinate and adjust movement schedules.
- Assist in implementing changes to vehicle or convoy routings.
- Assist in modifying convoy vehicle composition.

2-36. Since MCTs can be spread throughout an AOR on various MSRs and distribution nodes they can be a source of information on enemy threats. Commanders should develop information collection plans and reporting procedures for their MCTs to ensure that movement regulating teams are aware and knowledgeable about potential threats. Doing so will the team mindful of subtle to overt changes in the surroundings that could pose a threat to military convoy operations.

CARGO DOCUMENTATION

2-37. An MCT can provide assistance on cargo documentation including hazardous material forms, packing lists or other documentation for the transshipment of cargo at water, air, or rail nodes as well as at a central receiving and shipping point. An entire MCT is normally not needed specifically for this mission, but elements of an MCT can be sent to various distribution nodes to provide this capability or augment the existing documentation capability of other units as mission dictates.

DIVISION SUPPORT

2-38. An MCT operating in direct support to a division transportation office assists in the coordination of transportation required for the movement of units, cargo, and personnel in the division operational area. Under the direction of the DTO, the MCT validates transportation requirements, conducts route synchronization, and maintains ITV of unit equipment and sustainment cargo movements in the division AO. Additional details on the role of an MCT assigned in a division support role are detailed later in this chapter.

DIVISION

2-39. The division is the formation that is optimized to serve as a tactical unit of execution for a corps conducting decisive action operations during large-scale combat operations. Divisions are organized, manned, trained, and equipped for operations of up to five BCTs. Divisions are normally fixed organizations, typically consisting of infantry, armor or Stryker units, functional brigades, and a division support brigade.

DIVISION TRANSPORTATION OFFICER

2-40. The DTO is a special staff officer normally assigned in the main command post sustainment cell of the division headquarters involved in the movement of units and maneuver elements in coordination with the division G-3 and assistant chief of staff, logistics (G-4). The DTO is responsible for the development and publishing transportation policy for the division, advises the commander, and coordinates transportation support with the division G-3 and G-4. The DTO coordinates with the G-3 on operational movements, the G-4 on sustainment, and provides guidance on transportation issues with other staff sections and commanders. The DTO also—

- Establishes procedures for movements that cross boundaries.
- Receives and analyzes route statuses for corps MSRs and ASRs.
- Coordinates deployment and redeployment of forces with the division G-3.
- Coordinates tactical relocation of forces with the division G-3.
- Prepares the division movement program.
- Monitors the availability of subordinate brigade transportation assets.
- Regulates movement along division controlled MSRs and ASRs.
- Assists the division G-4 in preparing, updating, and maintaining the transportation portion of the logistics estimate.

2-41. In addition to the above mentioned functions, the DTO coordinates with other division staff offices to include the provost marshal, engineers, the U.S. Air Force air mobility liaison officer, and subordinate staffs such as the brigade support battalion (BSB) SPO's transportation section. The DTO movement control efforts also require close coordination with the MCB and the MCT providing area support. Additional coordination can occur with the sustainment brigade, combat aviation brigade, MEB, and CTO.

2-42. The DTO is the focal point for transportation technical guidance and assistance for the staff in areas of planning and in the execution of operations. With the mobility officer assigned to the office and the MCT in direct support, the DTO—

- Conducts route synchronization (in coordination with the G-3 and supporting military police units) to include movement regulating teams, providing movement credits and march tables for sustainment convoys.
- Assists in the container management and tracking process.
- Provides technical assistance in planning for unit movement by all modes.
- Participates in the military decision making process as a member of the division planning staff.
- Conducts parallel and collaborative planning with the staff to integrate movement, maneuver and transportation sustainment operations.
- Prepares a movement program.
- Develops the deployment, movement, and route synchronization portions of the division OPLANSs and operations orders (OPORDs).

- Validates and coordinates the requirement for external transportation when requirements exceed a brigade's organic capability.
- Maintains the status of subordinate brigade's transportations assets.

MOVEMENT CONTROL TEAM (DIVISION SUPPORT MISSION)

2-43. The MCT that is in direct support to a division headquarters is placed under the management of the DTO to augment that staff and assist in providing transportation support planning, programming, and operations required to support the range of military operations. The team operates on a 24-hour basis to assist the DTO in planning, scheduling, controlling, and coordinating mode operations. The team's automations systems also provide the division linkage to the theater movement control network and maintain ITV of materiel and personnel transiting into, within, and out of the division area. This MCT is requested prior to the division's deployment. Other functions with which the MCT can assist the DTO include—

- Execute route synchronization.
- Coordinate for use of MSRs or ASRs within a division-controlled area.
- Operate first destination reporting point for within a division operational area.
- Provide technical expertise to transportation users in the division operational area.
- Provide movement control support for any divisional movements.
- Provide movement control capability to augment a BCT or other divisional units as needed.
- Assist division headquarters and subordinate brigades with deployment and redeployment operations.

MANEUVER ENHANCEMENT BRIGADE

2-44. The MEB is a multifunctional headquarters that controls movement throughout its operational area. The MEB is designed to provide command and control of forces from multiple branches, but especially those that conduct support area operations at the division and corps echelon. (See FM 3-81 for additional responsibilities of the MEB.)

2-45. When the MEB is assigned responsibility for the supported area, it controls all movement throughout the operational area. Units may not move through ground or air LOCs without clearance from the MEB. The MEB ensures movement within its area does not interfere with the corps or division commander's maneuver or fires execution. A distinction of the MEB from sustainment units involved in movement control is its capability to conduct operations in the assigned echelon supported area which provides added security and defense for other units and enhances the freedom of mobility for the supported echelon.

2-46. The echelon that designates the supported area must provide guidance on the roles and responsibilities for movement control, protection, and defense of forces moving through the operational area or originating in the supported area that move into other operational areas. The higher headquarters, through its MCB and MCTs, has primary responsibility for movement control within the theater.

2-47. During the movement control process the MEB regulates movements and route synchronization. If the movement is conducted on MSRs or ASRs designated by higher headquarters, the MEB commander regulates movement in coordination with the DTO, MCB and MCTs.

DIVISION SUSTAINMENT BRIGADE

2-48. The division sustainment brigade (DSB) is assigned to a division and is the controlling headquarters for the integration and synchronization of sustainment operations at the division echelon. The DSB staff supports the division staff in sustainment planning and task organization of sustainment capabilities. The DSB task organization includes an organic division sustainment troops battalion and division sustainment support battalion and division sustainment support battalion.

2-49. Depending upon the mission, the DSB can command up to seven battalions. The division sustainment brigade provides general support logistics, personnel services, and financial management to non-divisional forces operating in the division area.

2-50. The DSB transportation operations branch supports the division G-4 by contributing to the development of the division movement plan. This branch assesses the transportation network to determine the workload capacity of each route by mode and the capabilities at each node. Transportation capabilities at each node must include loading and unloading capability (MHE, CHE, ramps) storage capability, and any other factors that affect transportation services. The DSB transportation operations branch also updates the transportation assessment provided in corps & division orders with new information (if available) prior to developing the next movement plan. The branch determines transportation capabilities available at each node, to operate by each mode for each applicable planning horizon.

2-51. When necessary, an MCT can be allocated in direct support to a DSB with responsibilities to assist the DSB in planning, scheduling, controlling, and coordinating mode operations.

BRIGADE COMBAT TEAM

2-52. Within the BCT headquarters, the battalion or brigade logistics staff officer (S-4) staff performs limited movement control functions due to minimal transportation staff. The S-4 transportation staff includes a mobility warrant officer and an 88N noncommissioned officer. This staff section provides the following support:

- Establishes supply routes in the brigade area in coordination with the DTO and brigade's support battalion.
- Establishes a brigade route synchronization plan for movements within the brigade area, and for incoming sustainment convoys.
- Reports the status of containers.
- Reports the maintenance and supply status to the division.
- Coordinates with sustainment brigade for additional transportation assets outside the BSB's capability.

BRIGADE SUPPORT BATTALION

2-53. The BSB commander is the senior logistician in the BCT and provides critical transportation planning and execution capability. The BSB SPO transportation section provides movement control support to the BCT to fulfill the BCT commander's distribution movement requirements. Additionally, the SPO—

- Holds tasking authority over the BSB's common user transportation assets.
- Coordinates with the DSB SPO when transportation requirements exceed the BCT capabilities.
- Maintains information on the status of its transportation assets allocated to support movement requirements and includes the transportation assets of the forward support companies.
- Monitors the status of containers, flatracks, pallets, and trailers in the BCT AOR.
- Coordinates sustainment movement outside the BCT operational area with the DTO and informs the BCT S-4.

OPERATIONAL CONTRACT SUPPORT

2-54. OCS is the process of planning for and obtaining supplies, services, and construction from commercial sources in support of CCDR-directed operations. The OCS process begins when a requiring activity identifies a need for commercial support, and it concludes with a contract closeout. Acquisition personnel (contracting officers) and non-acquisition personnel and activities have OCS roles and responsibilities in this process. In some operations, OCS can enhance flexibility and increase operational reach while achieving objectives for the supported commander. (See ATP 4-10, AR 715-9, and JP 4-10 for more information on OCS.)

2-55. The use of OCS in movement control and distribution operations is a force multiplier that enhances the capability of commanders to provide more effective and efficient transportation support to their supported units. Contracts may be established to provide additional mode capability to include truck, bus, rail, fixed and rotary wing air assets, or watercraft transportation. Contractors, normally through a logistics civil augmentation program task order, may also augment MCT operations. To effectively manage contracts, commanders must leverage the abilities of their staff and subordinate units by selecting a technically qualified

person to perform the duties of a contracting officers' representative to ensure the contractor is in compliance with contractual requirements. The key to effective contractor support is ensuring contractors follow the requirements detailed in the contract, and the contracting officers' representative is critical in managing those requirements. The contracting officers' representative can come from the TSC, ESC, or sustainment brigade based on—

- The ability to best monitor contract performance.
- The magnitude of the contract.
- The level or organization that has central oversight of the movement requirements the contract will support.

This page intentionally left blank.

Chapter 3

Movement Request Process during Large-Scale Combat Operations

The movement request is the start point for committing allocated assets to satisfy a movement requirement. The focus of this chapter is on the movement request process at TSC echelon and below. At each echelon mentioned in this chapter, the discussion focuses on who accomplishes the actions needed to create the end state of the process, the TMR. The TMR serves as a mission number and aids in the visibility and tracking of transportation movement requests and assets across all echelons during large-scale combat operations. A TMR is issued whenever Army common-user transportation assets are used to support the range of military operations such as deployment, redeployment, and distribution and is the mechanism to assign transportation movement missions to the mode operator. A TMR is normally issued by an MCB or MCT but exceptions do exist within theater of operations that are conducting small scale and wide dispersing transportation operations. When a movement control unit is not available, the ASCC will determine the best course of action to process transportation movement releases.

MOVEMENT REQUEST IN THE THEATER AND CORPS ECHELON

3-1. An MCT is the immediate interface for Army units requesting transportation support when the unit's requirement exceeds their organic capability in their designated area of support at echelon. The MCT can receive movement requests from customer units such as a sustainment brigade, engineer, military police, personnel, medical or another service, to move a variety of supplies, equipment, or personnel. See table 3-1 on page 3-2 for data elements of a movement request. The MCT is also the first point of contact for other DOD organizations needing Army common user transportation. Movement requests can also be initiated as a function controlled by the TSC or ESC movement program that directs the MCT to use the movement program's preplanned mode and mode operator for the mission. For more information, see chapter 4.

Table 3-1. Example movement request data elements

Movement Request		
Type	***Requestor POC***	***Requestor Operation***
Priority		
	MODE	
Mode Method		
	ORIGIN	
DODAAC	Requested Spot Date	Mode
MCE	Requested Load Date	Installation
Street Address	Requested Pull Date	
	DESTINATION	
DODAAC	RDD	Street
Type	Requestor POC	Requestor Organization
City	Special Interest Code	Mode
MCE	Installation	PIC Required
Destination POC		
	CARGO	
Pieces	Weight	Dimensions

LEGEND:
DODAAC = Department of Defense activity address code
MCE = movement control element
PIC = positive inbound clearance
POC = point of contact
RDD = required delivery date

3-2. The MCB or MCT will determine the most appropriate mode of transportation, such as truck, rotary wing, or fixed wing. The MCB or MCT will consider a variety of factors to determine the most effective and efficient means to fill movement requirements. These factors include—

- Allocated transportation assets. The availability status of the mode operator's transportation assets must be a factor in determining which mode and which organization can execute the mission.
- Priorities. Provide service according to the command priorities for movement and support.
- Security. Consider security requirements for shipments involving hazardous or sensitive cargo. This may require cargo to be guarded or that the movement is conducted at night, by air, or by any other means to safeguard the cargo.
- Backhaul. Identifying the availability of cargo for transport on return missions is an important planning consideration to maximize vehicle usage.
- Political considerations. Determine if there is any political sensitivity to materiel being shipped. This may require movement through a HN at night, by air, or other means.
- Tactical considerations. Depending on the type of military operation or phase, the environment can be extremely fluid and non-static. Coordinate with the requesting and destination units to determine potential changes in pickup or delivery locations.
- Routes. Rerouting may be required if there are changes to route classifications, the distribution pattern, or one of the other factors dictates a change.
- Rail movement. This mode is suitable for bulk and high tonnage cargo for delivery along the rail line and where trans-loading can be accomplished with MHE and CHE.
- Air movement. Use of aircraft as a delivery mode is constrained to the air assets allocated for logistics support to the MCB. Transportation to move the cargo to and from the airfield or landing zone must be planned.
- HN and commercial assets. Use is limited to those modes and assets provided by the host country or available through commercial contract. HN support is coordinated by the assistant chief of staff, plans (G-5) or units having a HN coordinating mission. The HN or a commercial contractor may not have the authority to move certain military cargo or may be limited to the geographical areas within a theater. Security of the commercial or HN transportation assets must be considered as

well. Contractor identities will be vetted for locally employed personnel and other trusted positions.

3-3. Once all factors are assessed, the origin MCT can request positive inbound clearance (PIC) for sensitive, classified, oversize, overweight, or other priority or high visibility shipments through the destination MCT. ***Positive inbound clearance*** **is the process of the origin movement control team contacting the destination movement control team before a transportation movement release is created to ensure the destination unit has the capability to receive the shipment, considering materials handling equipment, storage and personnel available.** The destination MCT confirms the organization's location and ability to off-load the cargo with the origin MCT. The destination MCT also has the responsibility to close out all TMRs with the origin MCT by coordinating with units in their operational area to verify when delivery is complete.

3-4. When a TMR exceeds the capability of an MCT, the MCT will forward the request to the MCB. The MCB will review and verify if common user assets are available and commit the request based on the priority of support designated by the TSC or ESC. The MCB has committal authority over common user land transport assets as derived from ASCC, TSC or ESC. ***Committal authority*** **is the ability to obligate Army common user transportation resources against a transportation movement requirement.** The MCB can retain all committal authority of allocated transportation assets or transfer that authority to an MCT when operationally applicable. Normally, committal authority over transportation assets such as Army aviation, rail, Army watercraft, host nation and contracted support are retained at the MCB due to the limited availability of these resources.

3-5. When the MCB or MCT commits a mode operator it will create a TMR for the movement. The MCB or MCT will commit a mode operator and coordinate with a sustainment brigade or source transportation asset organization to execute the movement request (figure 3-1). The TMR or standing TMR will be tracked until completion, usually on a movement program. For more information, see chapter 4. **A** ***standing transportation movement release*** **is a document that assigns a transportation capability to a movement requirement that has the same origin, destination, load time, spot time, pull time and is a perpetual requirement.** The mode operator submits a request for convoy clearance or route authorization to its supporting MCT if required.

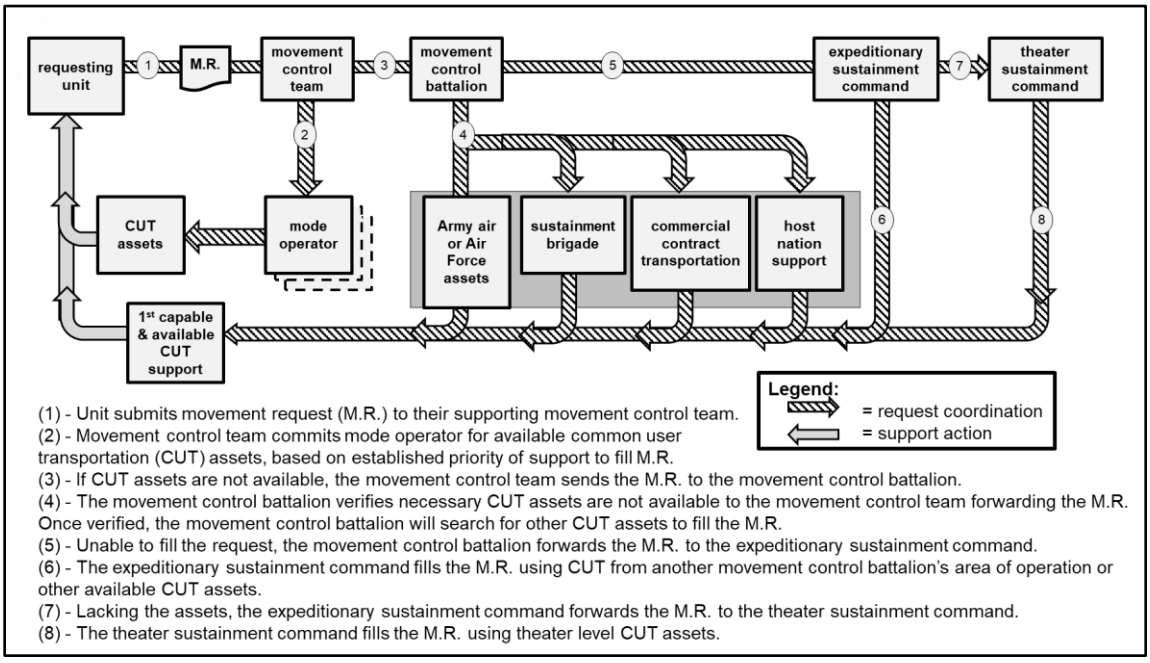

Figure 3-1. Example movement request process in movement control battalion

3-6. The sustainment brigade SPO receives the movement requirements from either a higher headquarters' movement program, an internal brigade requirement, or a commitment from the supporting MCB or MCT.

The SPO staff, as part of the TSC or ESC movement board, provides the forecast of available common user transportation assets for inclusion to the sustainment headquarters movement program and to the supporting MCT. When the ASCC, corps or division movement program is published, the sustainment brigade will task its subordinate battalions and in turn, the battalions will task their subordinate units. The sustainment brigade will coordinate with the supporting MCT to ensure that missions resulting from the movement board are matched with a TMR.

3-7. Within the sustainment brigade, if a company requires additional transportation support it will send its movement requirement to its battalion SPO for review of satisfying request with internal assets from another subordinate organization. If the battalion cannot satisfy the requirement with its internal assets, the battalion SPO will forward the movement requirement to the brigade for support. The sustainment brigade will review and determine if the requirement can be filled using assets from another battalion within the brigade. If so, the brigade will task the supporting battalion to fill the requirement. The brigade SPO section ensures internal movements are coordinated with the supporting MCT to confirm a TMR is created for the mission.

MOVEMENT REQUEST IN THE DIVISION

3-8. The movement request process in the division starts at the brigade echelon (BCT or multifunctional support brigade). Units submit movement requirements through their battalion S-4 for review and execution if assets are available. If transportation assets are not available, those movement requirements are forwarded to the brigade S-4 for processing. Movement requirements that exceed the brigade's capability or capacity to support are referred to the DTO, initiating the movement request process (figure 3-2). Unlike a brigade, the DTO may have access to additional transportation assets such as rotary or fixed wing Army aviation assets that can be used to assist when requirements exceed capability at the brigade echelon. The DTO validates the movement requirement and determines the best method for execution based on the division commander's priority for movement. Once assets are committed, the DSB is responsible for developing a distribution plan with validated movement requirements.

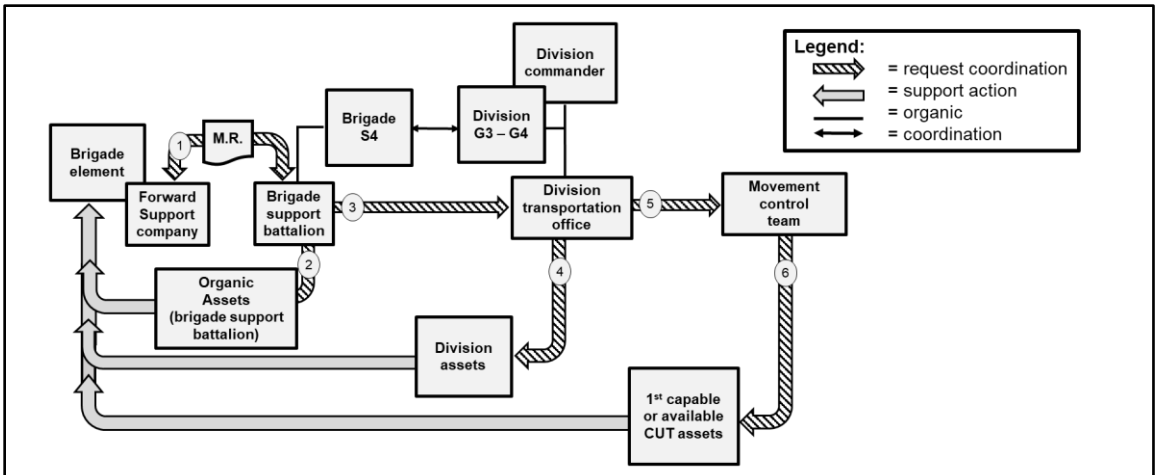

Figure 3-2. Example movement request process in a division

3-9. A movement request that exceeds the division's capability is forwarded to a MCT providing area support (not the MCT augmenting the DTO). The area MCT may have access to sustainment brigade, contracted, or HN transportation assets to commit in order to fill the request. If the MCT does not have the capability to meet the division's movement request, the team will forward the request to the MCB. When there is no MCT providing area support, the DTO will forward the movement request to the SPO of the

supporting sustainment headquarters such as the combat sustainment support battalion or sustainment brigade.

This page intentionally left blank.

Chapter 4

Developing an Integrated Movement Program

This chapter is for movement managers at all levels and explains how to conduct movement boards and develop an integrated movement program to match transportation movement requirements against transportation capabilities supporting distribution, deployment, and redeployment operations. Movement boards and integrated movement programs require direct coordination between materiel managers, movement managers, and mode operators.

MOVEMENT BOARDS

4-1. At each level of command, brigade through theater, various boards or cells may be established to focus the management of certain logistics functions. The most common of these are movement and distribution boards. Movement boards are a mechanism to review and manage transportation policies, priorities, route status, convoy protection and synchronization, and transportation asset allocation to support distribution operations. Movement boards should be conducted regularly to validate transportation movement requirements against transportation capabilities. The movement board should cover the major internal and external movements by all modes of transportation supporting deployment, redeployment and distribution operations affecting organic transportation units or supporting assets. Distribution boards receive input from movement boards to provide theater movement controllers with updates on distribution priorities, major unit moves, and a means to provide input concerning changes to MSR, ASRs, and area security status.

4-2. Ideally, the movement and distribution boards should be conducted sequentially on a daily basis to support the next higher level of external support requirements and provide a forum to present issues and transportation shortfalls that can be resourced at the next headquarters level. Each movement board will provide the capability to change transportation resource allocation and adjust to changing priorities or contingencies. A validated movement program is the outcome of a board and ensures all movement requirements are matched with the appropriate capability. The movement board also ensures necessary coordination and synchronization for mission execution is requested for movement occurring within the next 24–96 hours. Participation at the higher-level movement boards should include those headquarters and agencies that have equity in the distribution process. When transportation assets are tasked through a movement program, the MCB will ensure a TMR is produced to capture that transportation movement requirement. At the brigade, division, corps, and theater level, movement boards at a minimum should cover—

- Current threat assessment.
- Deployment and redeployment movements along with operational movements.
- Validated transportation movement requirements 24, 48, 72 and 96 hours out.
- External transportation movements entering an organization’s area of operation 24, 48, 72 and 96 hours out.
- Convoy security or escort requirements and protection support.
- Priority of movements and priority of support.
- Current and projected route and weather status.
- Retrograde and backhaul requirements.
- Human resource coordination for movement and distribution of personnel, transients, and non-unit replacements.

THEATER AND CORPS MOVEMENT BOARDS

4-3. The deputy commanding general for support or CTO will establish movement boards to manage transportation policies, priorities, LOC status, convoy protection and synchronization, and transportation asset allocation to support theater corps distribution operations. The sustainment command movement boards validate movement requirements and at this level could be daily or weekly depending on the situation (such as the number of movement regions), but must be frequent enough to adjust to changes. Subordinate units, such as the sustainment brigade, transportation brigade expeditionary, and MCB, publish in an order and execute the resulting TSC or ESC validated movement program. The sustainment brigade and MCB can simultaneously start their planning and coordination for the pending missions. Theater-level movement boards should include but are not limited to—

- Sustainment command SPO, and DMC materiel managers and transportation operations and distribution plans and integration branches.
- Sustainment command assistant chief of staff, intelligence, G-3, G-4, assistant chief of staff, financial management, and G-9.
- Sustainment command subordinate brigades.
- MCBs.
- CTOs.
- MEBs.
- JDDOC.
- SDDC.
- COR.

DIVISION MOVEMENT BOARDS

4-4. At the division level, the DTO will normally chair movement boards. In a joint or multinational operational, the division G-4 or the deputy commanding general for support could chair movement control boards. The outcome of a movement board is a validated division movement program. This ensures all internal movement requirements are matched with the appropriate capability and the coordination and synchronization for mission execution is confirmed for movement occurring within the next 24–48 hours. For movement occurring outside of 48 hours it is important to identify potential requirements along with the availability of committed assets. Representatives at a division level movement board should include—

- DTO.
- Division assistant chief of staff, intelligence, G-3 current operations, G-5 and G-9.
- Subordinate BCT S-4s and BSB SPO.
- DSB SPO or SPO human resource operations branch for movement coordination of personnel.
- Representatives from separate brigades, battalions, and companies.
- Provost Marshal.
- Division engineers.
- Representatives from subordinate units attached to or under operational control of the division from any non-divisional supporting brigades (MEB, aviation, and sustainment).
- MCTs providing area support.
- Representatives from the protection cell (military police, chemical, biological, radiological, and nuclear [CBRN], explosive ordnance disposal).
- Cyber electronic warfare officer.

THEATER MOVEMENT PROGRAM

4-5. A theater movement program is a command directive prepared by planners in the ASCC with assistance from the MCB, or tasked by the ASCC to a sustainment command and disseminated through the orders process. A movement program is used to plan anticipated transportation requirements for movement and flow of units, personnel, materiel, and sustainment supplies. During the movement planning process, movement planners allocate available Army and HN common user transportation resources based on the

commander's priorities. It incorporates all movements originating from a movement request via an MCT in coordination with the TSC or ESC DMC materiel managers, transportation operations and distribution plans and integration branches, as well as the plans, programs, and operations section of the MCB. A division, BCT, or separate brigade may also create a movement program to better synchronize their distribution operations.

4-6. The theater movement program supports the commander's priorities by establishing what requirements can be resourced given available transportation assets, units, and infrastructure. Doing this effectively uses these available assets and identifies competing requirements and shortages required to support combat and sustainment operations. This requires supported units to provide accurate data when developing transportation requirements and inform movement planners of current and projected operating sites. Maintaining flexibility in the planning process enables the plan to be adaptable because requirements often change based on changes in priority, unit locations, asset availability, and conditions of the LOCs. Therefore, supporting movement plans should have fully developed alternatives based on likely courses of action. The complexity of managing the movement operations requires the MCB be resourced with sufficient MCTs and communications equipment to provide adequate movement control and operational flexibility.

4-7. The theater movement program serves as an authority to commit transportation assets. It authorizes the MCTs to issue TMRs, directs mode operators to furnish assets, arrange commercial movements, and alerts receiving units to accept programmed shipments so they can unload transportation assets promptly. There are nine basic steps used to develop a movement program:

- Step 1. Assess the distribution pattern.
- Step 2. Determine requirements.
- Step 3. Determine transportation capabilities.
- Step 4. Balance the requirements against the capabilities.
- Step 5. Determine critical points.
- Step 6. Determine CPs.
- Step 7. Determine shortfalls and recommended solutions for handling the shortfalls.
- Step 8. Coordinate the movement program.
- Step 9. Format and publish the program.

ASSESS THE DISTRIBUTION PATTERN

4-8. The distribution pattern is a complete logistics picture that shows the locations of ports, supply activities, shipment consignees, maintenance activities, shipment nodes, and transportation activities. Operational needs will dictate the distribution pattern and allow planners to determine where support will flow or be diverted as required. The distribution pattern constantly evolves as the theater develops. The commander's concept of operations guides development of the distribution pattern which takes into account the number, types, and locations of in-place and incoming units, and their time-phased arrival in theater. The distribution pattern delineates throughput and inter-zonal transportation requirements directly affecting the coordination and preparation of movement programs.

4-9. Movement planners use the distribution pattern to develop the transportation network. The pattern shows the complete system of routes pertaining to all modes of transportation available in the theater. Movement planners study intelligence and engineer information on the operational area to determine the capabilities of transportation networks and determine existing or potential threats to movement. Concurrently, they determine the suitability and feasibility of moving supplies, equipment and personnel over those transportation networks. Based on these studies, movement planners recommend locations for transportation units and modes to make full use of the transportation networks.

4-10. Movement planners at the TSC and ESC level coordinate with their subordinate units regarding the positioning of transportation units and supply activities. Determining appropriate positioning includes shipper and receiver capability to receive, handle, and load by various transportation modes. The sustainment commands utilize the information to determine the availability of MHE, CHE, ramps, labor, storage capacity, and other factors that affect transportation services. This ensures units are positioned so their capabilities will enhance the distribution system and for the efficient scheduling of transportation to prevent congestion.

DETERMINE REQUIREMENTS

4-11. An effective movement program is based on having accurate requirements being forecasted and submitted far enough in advance for the transportation and supply systems to adjust their resources to carry out the program. Requirements for movement can be generated at the TSC and ESC command level during high operating tempo, or at the MCT level during more static and permissive periods. The movement program requires major subordinate commands to provide their movement requirements that exceed organic transportation capability for inclusion.

4-12. Movement planners use planning periods for forecasting requirements, with the length of the periods based upon the number and frequency that changes are experienced or anticipated. A 14-day planning period is desirable to allow a firm forecast of requirements for the current seven-day period and a tentative forecast for the succeeding seven day period. This method provides a basis on which to operate during the current period and a tool for planning during the succeeding period. With a 14-day planning period, a new planning cycle is initiated every seven days.

4-13. Materiel movement requirements are developed and grouped in terms of classes of supply, estimated weight and cube, destination, priority, origin, and required delivery date (RDD). **The *required delivery date* identifies when personnel and/or cargo must arrive at its destination in order to properly support an operation or contingency.** Special handling requirements such as refrigerated cargo, hazardous cargo, and controlled or sensitive cargo should also be identified. Personnel movement estimates are grouped by category such as troops, civilians, patients, and prisoners of war.

DETERMINE CAPABILITIES

4-14. Movement planners at each command level determine the capabilities of the transportation mode operators in their operational area. They obtain from mode operators the characteristics and capabilities of the following—

- Number of units providing common user transportation and their equipment available to support common-user movement requirements.
- Total number of HN transportation assets allocated to support common-user movement requirements (including commercial, rail, and inland waterways).
- Number of third country and U.S.-contracted assets.
- Reception, materiel handling, and in-transit storage capabilities.

4-15. Movement planners must update capabilities with changes as they occur and adjust movement programs accordingly. When determining transport capabilities, planners must use planning factors or experience based on the type of equipment, availability of MHE and CHE, weather, and terrain. Planners can obtain planning factors from mode operators or from planning publications and electronic based programs. For additional information on planning factors, visit the Combined Arms Support Command, Fielded Force Integration Directorate – Planning Data Branch website listed in the index of this publication.

BALANCE REQUIREMENTS AGAINST CAPABILITIES

4-16. Balancing requirements against capabilities determines whether the available mode assets will support movement requirements. As a result of this step, movement planners determine the workload for each mode and segment of the transportation network. They should not limit this process to simply programming the use of available transportation capability. Planners must also consider command relationships and geographic areas of responsibility.

4-17. When movement planners assign requirements against all capabilities, it is accomplished in a logical manner to also include the total transportation network, tactical situation, priority of movement, and the risk of failure. The example would be to use a more plentiful mode of transport for a critical shipment versus using a singular mode of transport (three roads versus one rail network) allowing for less critical movements using the singular mode of transport. Movement planners also consider the following competing workload requirements when assigning requirements against capabilities:

- Direct shipments.

- Multi stops.
- Retrograde.
- Intermodal shipments.

4-18. When transportation shortfalls occur, movement planners will adjust the movement plan according to command priorities and the priority for the shipment. The adjusted movements are coordinated with the shipper, receiver, materiel managers, and affected sustainment staffs and headquarters.

4-19. Schematics may be used to assist movement planners when balancing requirements and capabilities. Their purpose is to graphically portray total shipping requirements and available transportation capabilities as they relate to the distribution plan. Planners use two types of schematics: requirements and mode.

Requirements Schematic

4-20. Planners prepare a requirements schematic as shown in figure 4-1. The schematic is prepared as follows—

- Draw and circle origin and destination points obtained from movement requirement forecasts.
- Identify each origin and destination point.
- List the daily shipping requirements between each origin and destination point. The requirements list the classes of supply, the tonnage, and the movement program line number.
- Create a legend as shown in figure 4-1.

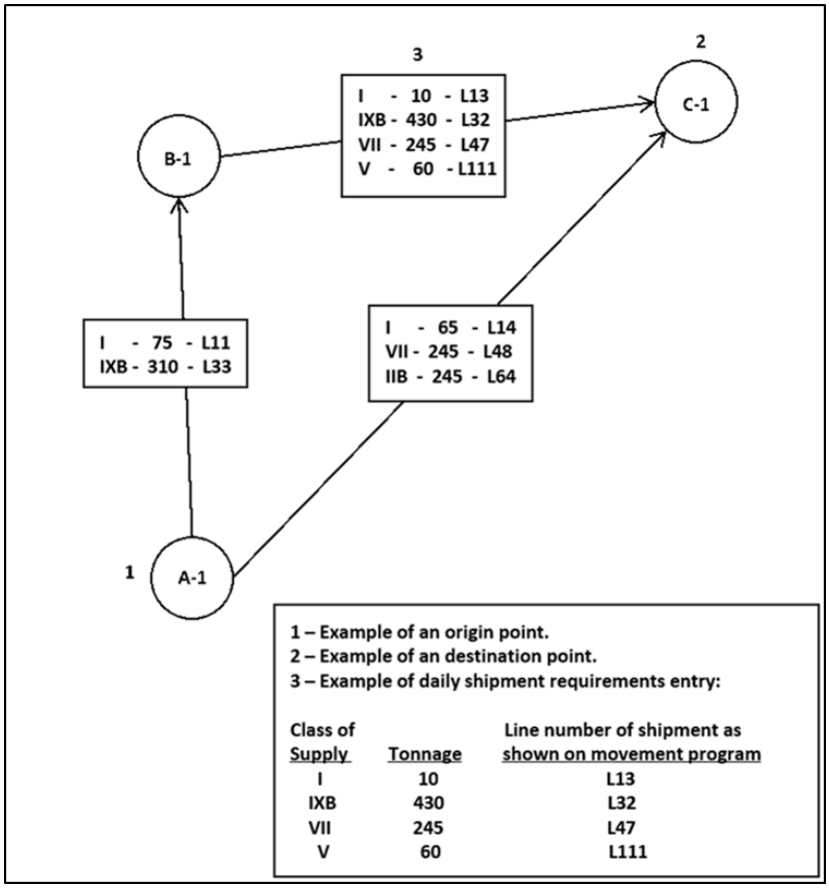

Figure 4-1. Requirements schematic

Mode Schematic

4-21. Planners prepare a mode schematic (see figure 4-2) for each available mode as follows—

- Draw and label mode origin and destination nodes and connect with lines. Connect the lines whether or not the current program requires movement on a segment.
- Note the mode capacity on the outside of the lines. Mode capacity can be expressed for rail and air as the total daily tonnage capacity between major terminals. For motor transport compute capacity in a particular area or as segments of a line-haul operation
- Identify the schematic.
- Assign program line numbers to each mode and list them between the modes as classes of supply, tonnage, and the movement program line numbers.
- Note the type of mode under the schematic.
- Create a legend as shown in figure 4-2.

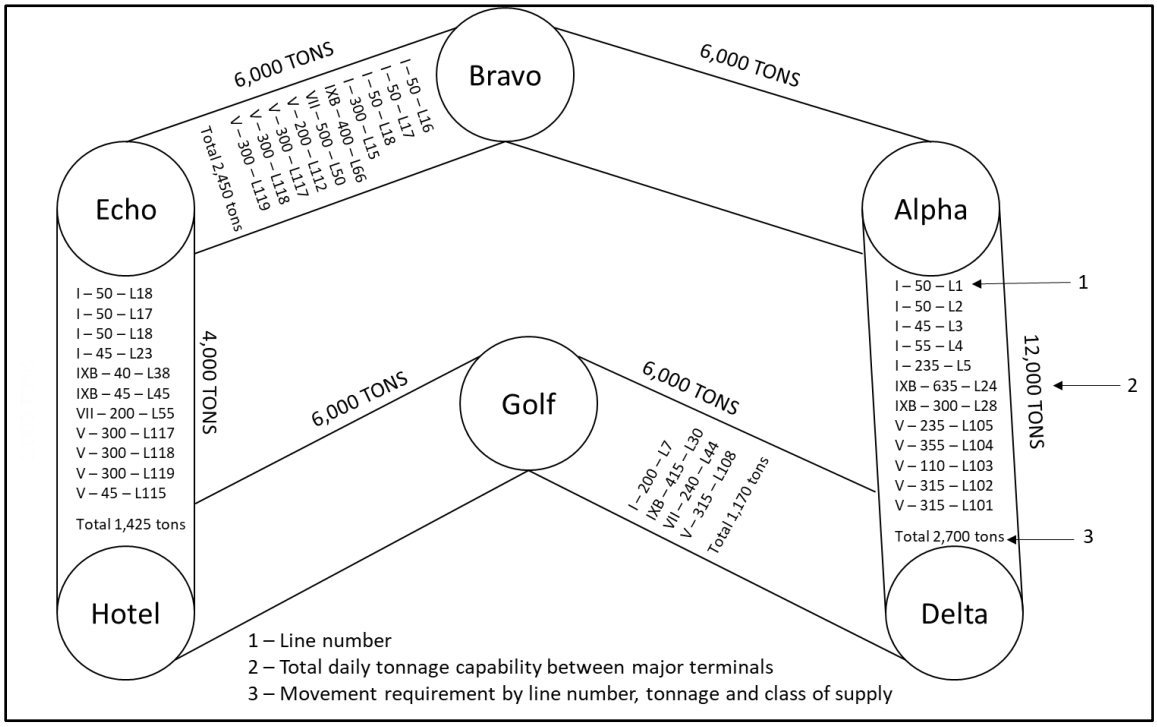

Figure 4-2. Mode schematic

Planning Sequence for Reception and Onward Movement

4-22. The sustainment command develops a comprehensive plan for reception and onward movement that adheres to a step-by-step process similar to that used to develop a movement program. Planners utilize estimates for the workload at specific transportation nodes to determine requirements for movement control, mode operating, and cargo transfer units. Planning includes estimating the operational periods for each mode of transportation required, to include the requirements for MHE, CHE, and HN support.

4-23. During this planning process movement planners at the port of debarkation (POD) do the following—

- Obtain advance arrival information for intertheater sea and air movement from port operators and operational planners.
- Assess the movement requirements data such as RDD, priority of movement, equipment characteristics, and special requirements.
- Group the requirements for each POD by destination geographic location in RDD sequence.
- Obtain movement priority for requirements that have the same destination and RDD.
- Determine available modes for onward movement based on upon planning requirements.
- Consider requirements, equipment characteristics, priorities, and modes servicing PODs, staging areas, and tactical assembly areas.

- Select mode for each requirement.
- Program the mode for each requirement for reporting to POD based upon estimated time for POD clearance. This is dependent on the type of strategic asset lift; air or sea.
- Determine availability of equipment for follow-on missions at the POD. Estimate uploading and processing time for each mode at the POD. Apply time-distance factors to estimate transit time to other transportation nodes, or arrival at the tactical assembly area or other destination. Determine total transit time, maintenance, crew rest, and return time.
- Resolve conflicts by rerouting, changing modes, rescheduling, or obtain guidance from operational planners. Reconfirm that the selected route can accommodate any oversize or overweight cargo being moved.
- Identify requirements for MHE and CHE for each mode at the POD, cargo and trailer transfer points, and at destination.
- Coordinate to establish holding and storage areas outside the POD marshalling area if ports become congested.
- Identify en route support needs for fuel, mess, maintenance, and billeting. Identify need and potential location of convoy support centers. Coordinate with the TSC for this support.
- Determine critical points where route synchronization or traffic control should be established to maintain the flow of traffic. Provide for en route communication.

4-24. Plan retrograde missions for equipment returning from staging area and tactical assembly area in the same manner as above.

Selecting a Mode

4-25. Movement planners use the following basic guidelines to allocate the mode of transport.

- Provide service according to command and transportation priority.
- Factors such as shipment characteristics, security requirements, and political considerations are also evaluated.
- Whenever possible, reduce or eliminate cargo re-handling, avoid cross hauls, and plan for backhauls.
- Allocate all available transport equipment necessary to fulfill known requirements.
- Use the most efficient mode for the complete movement or as far forward as possible.

DETERMINE CRITICAL POINTS

4-26. Movement planners identify critical points and the usual hours of the day, in which restrictions at those locations or activities could slow down or stop movement that limit the efficiency and effectiveness of the entire transportation network. Congested critical points limit the efficiency and effectiveness of the entire transportation network. Critical points include—

- Facilities.
- Terminals.
- Ports.
- Railheads.
- Bridges.
- Tunnels.
- Congested routes.
- Cargo transfer points.
- CPs.
- Border crossings.

4-27. After identifying the critical points, planners determine alternative plans or control measures that could reduce or eliminate the risk of congestion. The MCB can place teams on the ground where the problems are expected so they can respond before delays congest the system. They should also coordinate with the engineer and military police support where necessary.

4-28. The CPs identified by the movement planners to control movement are included in the movement program's MSR check point list. It provides ready reference data about the MSR network such as CPs, link numbers, feeder routes into the MSR, and distances. Movement control personnel and customers can use this information to identify what path to use from origin to destination and to identify segment numbers for use in requesting movement bids and receiving movement credits. When determining CPs, it is important that they be easily recognizable features identifiable on both the MSR CP list and on the route.

DETERMINE SHORTFALLS AND RECOMMEND SOLUTIONS

4-29. Once shortfalls between materiel to be moved and the transportation assets to move the materiel are identified, solutions must be developed. These include —

- Changing the date of the move to a later date.
- Assigning another motor transport unit to move the materiel.
- Assigning another mode (moving the materiel by rail rather than motor transport units).
- Using HN or commercial assets.
- Holding the materiel until transportation assets can be used to move items.

COORDINATE THE PROGRAM

4-30. The movement program is coordinated with movement planners and distribution managers at each command level during its development and validated at the movement board to ensure integrated planning and coordinated execution. Once validated it becomes a directive to plan and allocate resources against.

FORMAT AND PUBLISH THE PROGRAM

4-31. During the planning process, planners assign each movement requirement a movement program line number. This line number is used to identify the requirement and provide additional information throughout the development of the movement program. The movement program planning process can also be used to identify and plan for the expected arrival of units into the theater. Information in the cargo format includes—

- Program line numbers.
- TMR number.
- Container type.
- Class of supply.
- Pieces.
- Estimated weight (short tons and short tons cube).
- Cube.
- Origin.
- Transportation priority.
- Origin location.
- RDD.
- Destination.
- Mode.
- Destination location.
- Remarks.
- Destination MCT.

4-32. The remarks column should be used to identify characteristics for items requiring special handling. For example, the remarks column could include the dimensions of outsized or overweight cargo. Other examples include items requiring special handling such as controlled temperature, controlled environment, hazardous cargo, or cargo security.

4-33. Information in the personnel format includes—

- Program line number.
- Passenger type.

- Container type.
- Pieces.
- Estimated weight (short tons and short tons cube).
- Cube.
- Origin.
- Transportation priority.
- Origin location.
- RDD.
- Destination.
- Mode.
- Destination location.
- Destination MCT.

4-34. The sustainment command compiles activity address files for units in the theater. These files list in-the-clear unit locations and points of contact. Therefore, these files must be designated as classified documents and require protection in accordance with DODI 5200.01. The sustainment command provides a copy of each file to subordinate MCBs. These subordinate units also compile activity address files for units in their geographical area and update the sustainment command master file.

4-35. The movement program planning format may also be used to develop individual movement plans. Movement plans are initial developmental stages of a movement program that support specific OPLANs. As such, these movement programs are only plans until they are executed.

EXECUTING THE MOVEMENT PROGRAM

4-36. To activate a movement program line number, the shipper contacts its servicing MCT and requests its line number to be activated. The MCT verifies the program data is still valid by coordinating with the shipper. The MCT will coordinate with the receiver or destination MCT if a PIC is required. If command priorities change during the current program cycle and these priority changes affect program execution, movement planners will coordinate with affected shippers and receivers. Shippers or receivers should immediately contact their servicing MCT or DTO when there is a change in requirements, capabilities, or locations. Effective communication between the TSC, ESC, MCB, DSB, and sustainment brigades is required to execute an efficient movement program.

PREPARING THE PORT CLEARANCE PROGRAM

4-37. The port clearance program is a part of the theater movement program. The TSC or ESC begins preparing the port clearance program as soon as it receives an advanced manifest. Once the manifest (lists what is actually on the ship, plane or vessel and where stowed) is available, the MCT at the port does the following:

- Programs actual transportation assets to provide onward transportation based on anticipated arrival date.
- Activates line numbers or programs.

4-38. The MCT communicates through movement control channels the status of program being executed.

4-39. The TSC or ESC provides input to the terminal port commander if diversion is required. The sustainment command makes recommendations based on the following considerations:

- Cargo destinations.
- Available port capacities, capabilities, and workload.
- Capacities and projected workload for the various modes and segments of the transportation network.

This page intentionally left blank.

Chapter 5
Route Synchronization

Route synchronization is the planning, routing, and scheduling of movement on ground supply routes (MSRs and ASRs) in conjunction with movement clearance measures to regulate the flow of movement supporting military operations. Route synchronization is executed by commanders with the responsibility to provide order, prevent congestion, and enforce movement priorities for the ground supply routes in their operational area. The extent of the synchronization needed depends upon the number of moves, the number of brigade areas of operations being transited, and the capacity of the road network. Route synchronization is vital when operating over unimproved and congested road networks.

PLANNING FOR ROUTE SYNCHRONIZATION

5-1. Planned movement requirements are identified in distribution plans, movement programs, and OPLANs and orders. (See appendix C for road movement planning.) They involve onward movement of forces from PODs, redeployment of forces to ports of embarkation, movement of supplies and equipment, and movement of units. Immediate requirements are unplanned and based on requirements generated during the conduct of operations. They include requirements such as unit displacement, unprogrammed resupply, and evacuation. Immediate requirements are normally of a higher priority than planned requirements and require prompt action.

5-2. The goal of route synchronization planning is to sustain movements according to the commander's priorities and make the most effective and efficient use of the road networks through coordination with planners for unit movement and maneuver. Planning is done in a logical sequence and results in the publication of the route synchronization plan and the distribution network design (see chapter 2). The first step in the planning process is to assemble critical information. This information can be found in the following:

- OPLANs, OPORDs and estimates contain essential information needed for movement planners to understand the concept of operations to effectively support the commander's intent while executing route synchronization. The estimates provide information such as geographic boundaries, task organization, priorities, and locations of major supply activities.
- Engineer and military police route reconnaissance or classification overlays provide detailed information on the characteristics of the road network such as road surface, width, restrictive features, effects of seasonal weather conditions, and bridge classifications. Current information is required and thorough route reconnaissance may not always be possible or feasible. Therefore, movement planners may also obtain information from aerial photographs, local authorities, intelligence reports, and military police hasty route reconnaissance to supplement information obtained from maps or intelligence products and assessments. This information is necessary to determine critical points and route capacity and the characteristics of the route contained in the route classification formula used to create the route-classification overlay. See ATP 3-34.81 for more information on route reconnaissance and classification overlays.
- CBRN route reconnaissance provides information to movement planners and MCTs during CBRN operations. Adversaries use CBRN weapons to dissect the battlefield, severing LOCs and mission critical supply routes. When movement planners want to use a specific route that has possible CBRN contamination, CBRN reconnaissance platoons are employed to provide timely information regarding the type of agent, duration of contamination, and available by-pass routes around contamination. CBRN reconnaissance assets enable MCTs to determine uncontaminated (clean) and contaminated (dirty) routes, preventing the cross-contamination of logistical assets.

See ATP 3-11.37 for more information on CBRN reconnaissance operations in support of movement control.

- Traffic density information is the anticipated volume of traffic on route segments during specific periods and comes from planned requirements contained in the distribution plan, movement program, the OPLAN or OPORD, or fragmentary orders. Planners use the documents to extract the specified and implied requirements for unit movements, sustainment movements, and retrograde movements. These may involve moving dislocated civilians, unit displacements, or shared uses by multinational or HN forces that influence how each type of movement must be prioritized, planned, and coordinated.
- Intermodal and facilities data is obtained from the theater distribution plan, and includes the location of supply points, intermodal points, staging and assembly areas, and refuel points. These are considered in terms of their total clearance and reception capabilities, with specific considerations given to location, access from supply routes, and their capability to receive, load, unload, and stage personnel, cargo, and equipment.

5-3. When the data is assembled and studied, movement planners will identify the road networks that are capable of supporting the volume of traffic necessary to meet planned and anticipated movement requirements. These road networks will be recommended as MSRs and ASRs that include extensions of the MSRs to anticipate forward movement of maneuver forces and ASRs when the MSRs are disabled or too congested. The CCDR's, corps', or division's operations directorate of a joint staff, (J-3) or G-3 as appropriate, approves the selection of MSRs and ASRs to ensure maneuver and other operational issues are considered before movement planners can conduct detailed route synchronization planning.

5-4. Movement planners develop the route synchronization plan (see appendix D) and distribution network design after coordination with the J-3 or G-3. The route synchronization plan is a written plan that describes the MSR network and establishes control measures to promote effective regulation. The distribution network design is a map overlay or equivalent graphic representation of the MSR network. Both are published as an annex to the OPLAN or OPORD. They are used by the provost marshal to develop the traffic control plan. The development process involves—

- Naming each MSR according to command directives. Avoid using colors to name MSRs since the MSR status and other logistics statuses are normally reported as green, amber, red, or black. Avoid using numbers to name MSRs because they may conflict with existing route numbers. Establish a theme to the naming convention such as sports teams or automobile models.
- Determining critical points and areas along a route where movement may be slowed down or halted.
- Establishing CPs on each MSR to segment the MSRs. Segmenting the MSR facilitates route synchronization and traffic control planning and execution. CPs should be established at major crossroads, locations where road conditions change, major supply or service areas, geographic boundaries, assembly areas, and other critical points.

5-5. CPs are predetermined points on the MSR that are used as a means of regulating and controlling movement, and when possible, CPs should be easily identifiable from the air and ground. Units use CPs when requesting movement clearance by using CPs to identify their start point (SP), release point (RP), and en route CPs. CPs enable quick dissemination of information during execution such as a point where traffic will be rerouted. CPs are also used when describing the MSR in the route synchronization plan. The following list demonstrates some examples:

- MSR Spear is a paved, all weather road from CP 22 to CP 34.
- From CP 34 to the 1st BCT near boundary, the MSR is an improved fair weather road. The MSR can accommodate two-way traffic.
- The route is classified as an open route from CP 22 to CP 34.
- It is a supervised route from CP 34 to CP 8 at the division near boundary. Convoys of eight or more vehicles, tracked vehicles, or vehicles that cannot maintain a 30 kilometer (km) march rate require a movement credit on that segment.
- The most restrictive route feature is at CP 35, a bridge with a military load classification of 30. (See ATP 4-11 for additional details on military load classification.) Vehicles with a military load classification greater than 30 must use the ford at NJ334098. Signs for the ford are posted.

5-6. Planners should identify sufficient CPs to adequately exercise control, but no more than required to manage when the plan is executed. This requires careful balancing so that excessive CPs do not impede execution. Some examples are —

- Establishing control measures for each route. Control measures should be based on the engineer route classifications, planned and anticipated traffic volume, critical points, and mission variables (mission, enemy, terrain and weather, troops and support available, time available, and civil considerations [also called METT-TC]). Planners must also consider the capabilities of movement control and traffic control units to enforce the control measures. Control measures may change based on the conduct of operations. Movement planners must ensure that changes generated as the result of operational needs are incorporated into the OPORD or otherwise disseminated quickly. The five control measures are listed below:
  - Open route. This is the least restrictive control measure where any unit may use the route without a movement credit (document identifying movement number or an identification serial number). Minimum control is exercised.
  - Supervised route. The movement control headquarters will specify the size of convoys, the type of traffic, or characteristics of vehicles that require a movement credit to use the route. Limited control is exercised.
  - Dispatch route. A movement credit is required to use this route regardless of the number or types of vehicles. A dispatch route will normally be designated when traffic volume is expected to exceed capacity, or when the route is critical to operations and priority of use must be strictly enforced. Full control is exercised.
  - Reserved route. The route is reserved for the exclusive use of particular units or type of traffic and no other units or traffic may use the route. Reserved routes may be identified for large unit movements. Examples are when a maneuver unit must pass another forward, when reserve formations are committed, or when units are withdrawn for reconstitution.
  - Prohibited route. The route is closed and no unit or traffic may use the route. A route may be prohibited due to washouts, destroyed bridges, maintenance, or construction work. It may be prohibited for only short periods, such as the time necessary to do repairs.
- Making the distribution network design. The overlay will show all MSRs, ASRs, and route synchronization CPs, and include route names, direction of travel, boundaries, and principal supply activities. It will reflect any restrictive route features, critical points, and convoy support centers, and may include traffic control posts if provided by the provost marshal before publication of the distribution network design.
- Determining reporting requirements. Inform units using the MSR if reporting is necessary.
- Developing the route synchronization plan. This is accomplished during the planning process and is included in the OPLAN or OPORD. The written route synchronization plan will describe the information contained on the overlay and specify the control measures that apply to each MSR or critical segments of MSRs. If they can be determined and coordinated in advance, the control measures should be posted to the route synchronization plan and reflect the phases of the operation.
- Staffing and coordinating the plan provides the ability to recommend points and locations where traffic control will be required to set priorities for engineer repair and upgrade efforts.

PRINCIPLES OF ROUTING

5-7. Routing is the process of coordinating, synchronizing and directing movements on MSRs or ASRs. When routing traffic, movement planners should consider the four principles that govern routing:

- Balance. Balance is the matching of vehicle characteristics with route characteristics to ensure that vehicle traffic does not exceed the most limiting feature of a route.
- Separation. Separation is allocating the road space to ensure that military movements do not conflict with each other, with pedestrian movements, or with civilian traffic.
- Distribution. Distribution is allocating as many routes as possible to reduce the potential for congestion, enhance the useful life of roads and bridges (sustained capability), and prevent

deterioration of road surfaces (due to overuse). Distribution also promotes defense by distributing and separating traffic.

- Prioritize. Assign highest priority traffic to routes that provide the minimum time-distance.

METHODS OF SCHEDULING

5-8. Scheduling is the process of coordinating times for road and route movements. It involves receiving and managing movement requests and issuing clearances. Scheduling is essential to the application of the principles of routing.

5-9. The method of scheduling road movements is based on the control measures specified for the route. The four types of scheduling methods (from the least restrictive to the most restrictive) are described below:

- Infiltration schedule. This schedule is a rate of dispatch assigned to units for specific routes and time blocks to achieve an average traffic flow that is within the capacity of the route. By assigning rates of dispatch to different units that need to use the same route, average traffic flow can be held within desired limits. An infiltration schedule may be used for open or supervised routes.
- Route schedule. This schedule is a flexible scheduling method. It apportions blocks of time on MSRs to units, types of movements, phases of the operation, or for route maintenance. A route schedule may be used for supervised, dispatch, or reserved routes.
- Location schedule. This schedule is more restrictive than an infiltration or route schedule. It assigns arrival and clear times to different units needing to use the same entry point onto MSRs. The location will normally be a CP. For example, at a particular CP, unit A may be scheduled to arrive at 1000 and to clear at 1015, unit B to arrive at 1020 and to clear at 1030, and so on. A location schedule may be used for supervised or dispatch routes.
- Column schedule. This schedule is the most restrictive scheduling method. It specifies arrival and clear times at CPs along an entire route. It may be based on the requestor's movement request or movement table, or on movement tables issued by the movement control organization. Based upon the extent of control required, a column schedule can provide the most effective route synchronization because it provides in-transit times to reach CPs and helps the pacesetter maintain the prescribed rate of march. It may be used for supervised, dispatch, or reserved routes. It should also be used when congestion is anticipated.

5-10. Apply the following guidelines in scheduling movements:

- Movements on routes requiring movement clearance must be scheduled.
- Movements that cross movement control boundaries must be scheduled, coordinated, and inbound cleared by the movement control organization responsible for the area where the movement originates to the movement control organization where the movement terminates.
- Large unit movements must be scheduled.
- Movements in one direction, on routes that require a movement clearance, are treated as a single movement, regardless of the distance or time involved. Each movement retains the same movement clearance to destination.
- Schedules and changes to schedules (due to changes in the tactical situation or in immediate movement requirements) are provided to the movement regulation team’s MCT to execute route synchronization and to the provost marshal to provide traffic control.

CLEARANCE REQUEST

5-11. Units needing to move on controlled routes that require a movement credit must request and receive clearance before beginning movement. The request is submitted through the MCT within the area where the movement originates and forwarded to the highway traffic section of the MCB for processing. If a route is accessed by multiple MCBs, then the MCB will forward the request to the TSC or ESC transportation operations branch to process. Clearance requests that traverse along divisional routes will be submitted to the DTO for usage approval. All access that transit theater routes will be submitted through the servicing MCB or MCT. Certain movement will require cross coordination de-confliction through divisions, MCB and MCTs.

5-12. Requests are reviewed and considered based on command priorities for the type of movement and the unit requiring movement such as unit movement, movement of reserves, logistical movement, and movement of replacements. Unit or task force priorities are based on the commander's requirements to meet the tactical situation and are specified in OPLANs and OPORDs. In anticipation of operational changes, movement planners will frequently obtain planning guidance from the J-3 or G-3 to adjust support for movements and units based on changes in priorities.

5-13. At echelon, either the MCB or DTO schedules the movement as requested or notifies the unit if it cannot be granted. They will coordinate with the lower priority requestor to reschedule the movement at a different time or on a different route. If conflicts arise during planning that cannot be resolved by the MCB or DTO, they must seek resolution of the priority conflict through the staff that approved the priorities.

5-14. The movement credits are based on policies governed by command directives that develop codes used to create control numbers used to identify the unit or type of movement authorized on a controlled route. Movement credits normally include a command identifier, Julian date, and sequence number. For example, a unit of the 1st BCT will move on Julian date 043. The credit was the third issued for that date. The movement credit would be 01-043-003. Additional codes may be added after the sequence number to further identify the unit or type of movement. Command directives normally prescribe that moving units chalk the movement credit on the sides of their vehicles to identify the movement is authorized. The movement credit is provided to the provost marshal for traffic control and movement regulating purposes, and is returned to the requesting unit through the same channels used for the request at the completion of the movement.

COORDINATING MOVEMENTS

5-15. At echelon, the MCB or DTO must deconflict and coordinate the planned movement of convoys on controlled MSRs. This is done in order to coordinate departure and arrival times, manage movement priorities, and coordinate with the protection cell to ensure protection capabilities and resources are properly synchronized, integrated, and organized to prevent and mitigate the effects of threats and hazards on the MSR. Coordination requires daily and weekly meetings such as movements synchronization boards and groups to validate convoy departure times and issue movement credits, and as required to initiate the process to reroute or divert convoys. Coordination at all levels must occur before and during movement with the S-3, G-3, or headquarters responsible for the operational areas that the convoy is traversing.

5-16. While it is important for the MCB or DTO to monitor the in-transit status of all convoys, the operational area owner also plays a critical role in monitoring and supporting convoys as they traverse controlled MSRs and ASRs. Changes to route status due to weather, enemy activity, or threats identified through intelligence channels must be communicated to the highway traffic section of the MCB (for theater routes) or the DTO (for division routes), who are responsible for continuously updating and disseminating. Any changes to departure times will be communicated from the MCB's highway traffic section through the MCTs, who are responsible for communicating route status information and issuing movement credits. Any changes to departure time for a convoy require additional synchronization and coordination with all other movement enablers and the protection cell prior to issuing a new movement credit.

5-17. Without positive control measures, continuous communication and monitoring, the MSRs may become congested and movements will be delayed placing convoys at risk. The movement program and movement table (see appendix F) will provide commanders with the visibility and detailed information to visualize the location, composition and status of convoys at any time, and know when they should arrive and clear CPs.

5-18. Brigade-level commanders may have some responsibility for movement through their assigned operational areas even if the movement is conducted on MSRs or ASRs designated by higher headquarters. Depending on the established theater policy, units traveling through another brigade’s operational area may have to coordinate clearance from that organization, obtain intelligence updates, or coordinate security procedures. At a minimum, coordination must take place between the mode operator, the brigade owning the operational area, and the MCB. The TSC, ESC, or CTO can be involved if the operational environment dictates.

DIVERTING AND REROUTING

5-19. At echelon, the MCB or DTO will monitor the status of convoys to determine if movements are being executed as validated in the movement table. This enables the ability to initiate the diversion and rerouting of convoys, through communication with MCTs, mode operators, and the protection cell to influence changes and enforce control measures on MSRs. The MCB and DTO will normally coordinate with the mode operator's staff as opposed to directly contacting a convoy. However, there may be instances where contacting the convoy directly is the most expedient method to ensure the safety of the convoy. The route synchronization plan and policies must provide detailed procedures for coordinating and disseminating route status changes and information that will impact convoy movements.

5-20. Changes to MSR status, as indicated in appendix C, and traffic disruptions may be caused by weather, enemy actions, or threats identified through intelligence channels. These changes may require commanders to decide on the operational necessity of executing convoys. This requires a collaborative effort amongst the operational, intelligence, and logistics communities to anticipate potential traffic disruptions and disseminate information and guidance on road movement restrictions and route avoidance. The MCB or DTO must continuously seek out and monitor information from other commands or staff sections to make assessments of route status. Upon receiving reports of problems on an MSR, the MCB and subordinate MCTs can simultaneously adjust the movement program and movement table to ensure maximum synchronization to support operational and movement priorities. They can issue instructions to hold operational and logistical movements that have not departed, issue new routing instructions, or divert convoys to a different destination.

LARGE UNIT MOVEMENTS

5-21. Maintaining logistical support and uninterrupted transportation to other supported units in conjunction with large unit moves requires continuous coordination. Large unit movements will normally be planned by the moving units under parameters defined by the J-3 or G-3 and will involve opening routes for movement while rescheduling previously planned movements. Rescheduling depends upon the unit’s location and whether the movement commits the forces or moves them from one assembly area to another. Planning for movement of large units consists of four concurrent steps:

- Determining the requirements for the move.
- Determining the timeframe for the move.
- Analyzing organic and nonorganic movement capabilities.
- Establishing movement priorities.

5-22. The mission variables (mission, enemy, terrain and weather, troops and support available, time available, and civil considerations), drive the planning for large unit movements as they form the base requirement for the time and space factors characterizing the movement. The following factors are considered—

- Task organization of units, current location, and density.
- Adequacy of routes to support vehicles and tonnages.
- Available assembly areas and transportation modes at origin.
- Control measures, coordination, and logistics support for the movement and at destination.
- Assembly areas at destination.
- Deception measures before and during the movement and at destination.
- Enemy situation, route and geographic conditions and weather.

5-23. Preplanned movements require reevaluation in terms of their priority in relation to the unit movement to ensure critical supplies are pre-positioned or moved by alternate modes such as air, rail, or inland waterway if they are available. While in route, logistics support such as a refuel on the move, maintenance, and life support may require pre-positioning along with traffic control and MCTs.

5-24. Route synchronization planning requires extensive and thorough coordination to ensure critical road junctions are identified and managed. Synchronization planning will also need to address less critical movements so that they are rerouted, delayed, or shifted to alternate modes. Changes in plans may require engineering to upgrade routes or to construct bypasses or bridges. This will require scheduling guidance be

provided to the moving units that allows the units to conduct their internal planning for the movement. The main factor will be the availability of routes. Movement planners can—

- Create reserved routes for particular units.
- Use location or columns scheduling to allocate time blocks for movement if units share routes.
- Develop movement tables if routes are limited and the requirement for control is greatest.

5-25. Detailed movement tables are necessary for smaller units to execute their portion of the plan. However, the moving unit can develop these plans based on the allocation of routes or time blocks. Movement control organizations will not normally develop detailed movement tables for large unit movements.

This page intentionally left blank.

Appendix A

Allied and Joint Organizations

This appendix provides a brief overview of allied and joint organizations that support the Army's movement control effort.

ALLIED MOVEMENT COORDINATION CENTER

A-1. The multinational coalition commander may direct the activation of an allied movement coordination center in the event of a potential crisis. The allied movement coordination center is the multinational coalition commander's mobility and movement crisis management organization and movement coordination agency. The allied movement coordination center comprises representatives from the multinational coalition commander's movements staff, augmented when necessary from subordinate military headquarters and nations. The allied movement coordination center's purpose is to assimilate and assess information, develop movement options, and make recommendations to support the multinational coalition commander's decision-making process. The allied movement coordination center monitors the strategic deployment, transportation for sustainment (resupply), and redeployment of forces in order to assess status, progress, and areas of concern.

UNITED STATES TRANSPORTATION COMMAND

A-2. USTRANSCOM, as the joint deployment and distribution coordinator, oversees the overall effectiveness, efficiency, and alignment of DOD-wide distribution activities, including force projection, sustainment, and redeployment and retrograde operations. For more information, see JP 3-35. The joint deployment and distribution coordinator also supports the strategic flow of deploying forces and sustainment to sea and aerial ports of debarkation in the joint operations area. These services are provided through use of common user airlift, sealift, surface transport, and terminal traffic management activities. USTRANSCOM, through its transportation component commands SDDC-Army and Air Mobility Command (AMC)-Air Force, provides aerial port terminal management. Military Sealift Command – Navy, provides seaport terminal management and services to the supported CCDR. USTRANSCOM coordinates the efforts of these commands with the supported and supporting commanders. USTRANSCOM and all of the transportation component commands ensure ITV is available for sustainment movements, as well as time phased force deployment data units and cargo. ITV is critical throughout the distribution enterprise as it allows contracted lift or theater organizations involved in movement control to adequately plan for regulating traffic and allocating assets.

A-3. In order to carry out the command mission, the commander of USTRANSCOM has established the deployment and distribution operation center as a functional internal organization to provide strategic movement control throughout the Defense Transportation System (DTS). The center directs the global air, land, and sea transportation capabilities of the DTS to meet national security objectives. The distribution operation center fuses capabilities of multi-modal deployment and distribution operations, intelligence, protection, capacity acquisition, resource management, and other staff functions to collaboratively provide distribution options to the supported CCDR. The distribution operation center oversees and controls the majority of intertheater lift forces and logistic infrastructure. It also tracks the movement requirement from lift allocation and initial execution through closure at final destination through its support teams.

A-4. The distribution operation center uses a support team construct that provides upfront planning through collaboration with the supported commander and other key stakeholders. This allows the process to stay in step with commander's intent as the operation unfolds and increases visibility of all movement requirements. The geographical orientation of support teams enables a holistic view of strategic movement control and lift requirements, provides an opportunity to conduct a thorough transportation analysis, reduces correspondence

management, leverages collaboration technologies, and enables aggregation of requirements within movement windows.

MILITARY SURFACE DEPLOYMENT AND DISTRIBUTION COMMAND

A-5. SDDC is an operational level Army force designated by the Secretary of the Army as the ASCC of USTRANSCOM and a major subordinate command of United States Army Materiel Command. The mission of SDDC is to provide expeditionary and sustained end-to-end deployment and distribution support to meet the nation's objectives. As the single port manager (SPM), SDDC acts as a liaison between government shippers and commercial carriers. It is responsible for the establishment and maintenance of contracts, solicitations, and agreements with the carrier and stevedore industry to deploy and distribute DOD supplies and equipment worldwide. When required, SDDC provides deployment and distribution support teams. These special-mission teams support power projection platforms to assist organizations in preparing for origin-to-port of embarkation deployment operations. These teams are capable of providing technical support in the preparation and configuration of equipment for deployment.

A-6. SDDC manages the surface transport of defense materiel from the point of origin to the seaport of embarkation or aerial ports of embarkation in the continental United States. SDDC does the following—

- Coordinates all activities with the supported combatant commander.
- Works with the combatant commander to create water terminal force packages for situations where reliable stevedore labor or support infrastructure is needed.
- Recommends seaports of embarkation, both in the continental U.S. and outside of the continental U. S., establishes cargo booking procedures, and manages the movement of cargo onto and off ships.
- Manages common-user seaports of embarkation and debarkation both in and outside of the continental U. S.

A-7. The rapid port opening element is the Army organization of the joint task force–port opening assigned to SDDC, and under operational control of USTRANSCOM. The rapid port opening element provides specific surface deployment and distribution support, operational capabilities at a port of embarkation or POD and provides similar capability as a MCT performing an intermodal mission, as well as the cargo transfer capabilities of an ICTC. When employed, the rapid port opening element will perform the port of debarkation mission of an MCT until replaced with a sustainment headquarters such as a combat sustainment support battalion or sustainment brigade that is capable of performing the mission. The rapid port opening element coordinates with a sustainment headquarters to obtain additional motor transport assets or receive movement credits when needed for the movement of personnel, equipment or cargo from the POD, as well as provide visibility of movements that will assist the supported command and its subordinate units with their RSOI and distribution missions.

JOINT DEPLOYMENT AND DISTRIBUTION OPERATIONS CENTER

A-8. The JDDOC is an enduring capability of the CCDR that is the cornerstone for linking the theater with the DTS to support the CCDR's end-to-end movements. The JDDOC provides the CCDR with a movement control capability designed to synchronize and optimize national and theater multi-modal resources in order to meet deployment and distribution timeline requirements. It also serves as a link between multiple organizations including multinational partners, nongovernmental organization's liaison elements, commercial transportation providers, and other private entities. The JDDOC's assigned national partner representatives (see figure A-1) provide expertise and capability to reach back to national intratheater legs of the DTS. The premise behind the JDDOC capability is that theater expertise is combined with national-level, strategic knowledge and reach back authority within the CCDR's command structure. The JDDOC is an organization that accomplishes theater joint movement responsibilities for any potential logistic organizational structure as directed by the CCDR. Normally, the JDDOC is embedded under the direction of the CCDR's joint staff logistics directorate; however, it may be established in organizations below the CCDR level at the direction of the supported commander. Although the CCDR can organize this structure as appropriate for the specific theater, the JDDOC must be placed at a level where it can effectively accomplish

its assigned functions. The JDDOC must also be staffed and operated in the context of a joint command structure where command authorities can be used to accomplish the joint deployment and distribution mission for the joint force commander.

A-9. The JDDOC synchronizes the strategic to operational movement of forces and sustainment into theater by providing advance notice to the CCDR's air and surface theater movement command and control elements. The JDDOC collects data and provides the CCDR with ITV on lift capacity throughout both the intertheater and intratheater systems. It also coordinates all CCDR common-user transportation activities and integrates commercial lift capability as far forward as appropriate to move forces and materiel as quickly as possible based on CCDR requirements.

A-10. In concert with CCDR priorities and on behalf of the CCDR, the JDDOC coordinates common-user and theater distribution operations above the tactical level. It develops deployment, redeployment and distribution; and coordinates and synchronizes supply, transportation, and related distribution activities. The JDDOC resolves potential deployment and distribution problems through coordination of available theater logistical support capabilities and collaborates reach back to organizations critical to the CCDR's operational mission.

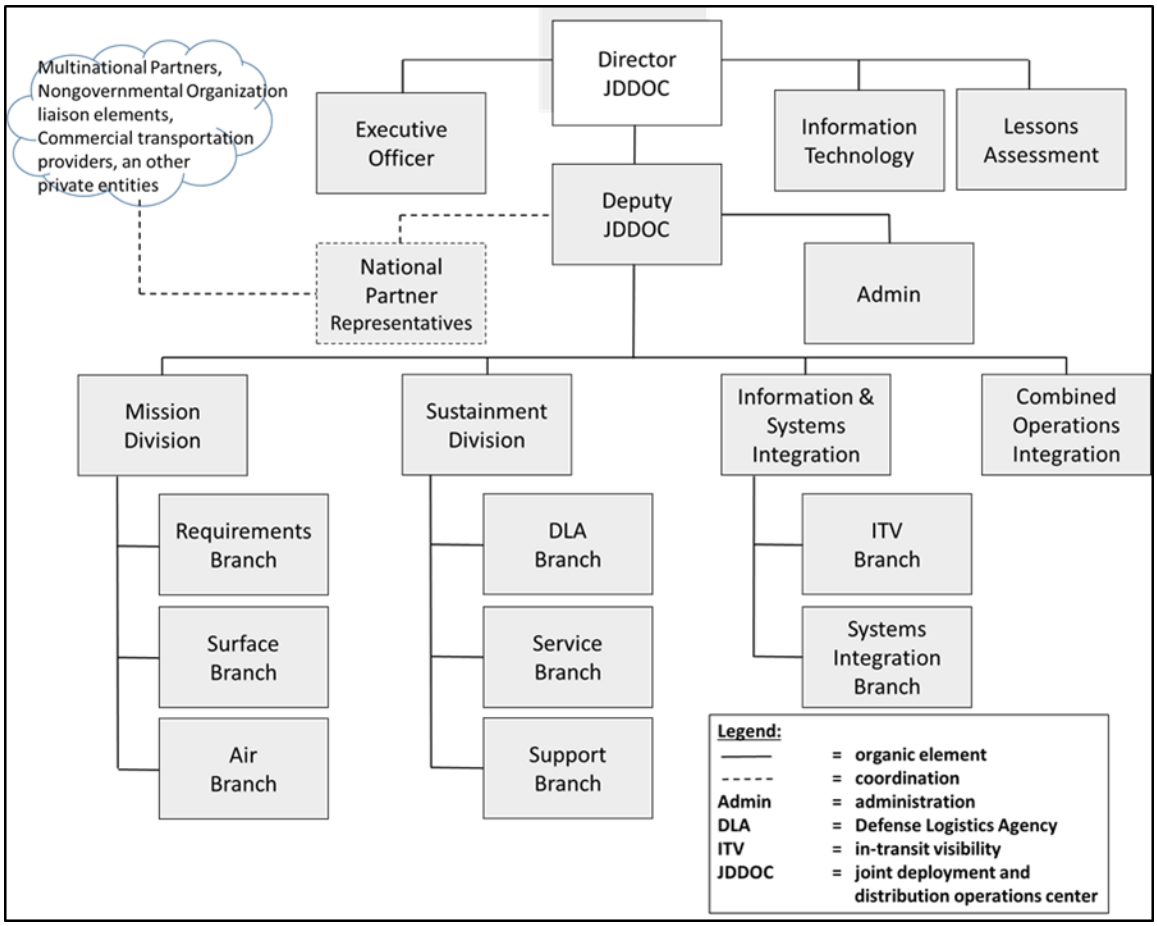

Figure A-1. Notional joint deployment and distribution operations center organizational structure

AIR MOBILITY COMMAND

A-11. AMC is a major command of the U.S. Air Force. As a transportation component of USTRANSCOM, AMC provides common-user air mobility (airlift and aerial refueling) and intertheater evacuation services to deploy, employ, sustain, and redeploy U.S. forces on a global basis. Additionally, AMC is the SPM of common-user aerial ports of embarkation and aerial ports of debarkation. AMC aircraft provide the capability

to deploy the Army anywhere in the world. AMC provides military and chartered civilian aircraft for transporting passengers, cargo, and air refueling operations.

A-12. In its SPM role, AMC performs those functions necessary to support the strategic flow of the deploying forces' equipment and sustainment from the aerial ports of embarkation and handover to the combatant commander in the aerial ports of debarkation. The SPM is responsible for providing strategic deployment status information to the combatant commander and to manage workloads of the aerial ports of debarkation based on the commander's priorities and guidance. The SPM is responsible through all phases of the theater aerial port of debarkation operations, from an unimproved airfield to a commercial contract supported port operation. In areas not served by a permanent USTRANSCOM presence, AMC through its contingency response wings, will deploy contingency response groups, contingency response elements, mobile aerial port flights, or mission support teams. An MCT, rapid port opening element or arrival and departure airfield control group will usually be co-located with AMC units at air terminals to coordinate onward movement of arriving and departing personnel, equipment, and supplies.

MILITARY SEALIFT COMMAND

A-13. The mission of the military sealift command is to provide ocean transportation of equipment, fuel, supplies, and ammunition to sustain U.S. forces worldwide, and therefore does not usually become involved in movement control.

JOINT MOVEMENT CENTER

A-14. A joint movement center may be established at a subordinate unified or joint task force level to coordinate the employment of all means of transportation (including that provided by allies or HNs) to support the concept of operations. This coordination is accomplished through established theater and joint task force transportation policies within the assigned operational area, consistent with relative urgency of need, port and terminal capabilities, transportation asset availability, and priorities set by a joint force commander. The joint task force-joint movement center will work closely with the JDDOC. For more information, see ATP 4-0.1.

Appendix B

Transportation Movement Release

The transportation movement release is a document that assigns a transportation capability to a transportation movement requirement and provides the movement details of the requirement.

A TMR is issued against Army common user transportation assets as the mechanism to assign transportation movement missions to the mode operator. A TMR is issued whenever Army common user transportation assets are used to support the range of military operations such as deployment, redeployment, and distribution. A TMR is normally issued by an MCB or MCT but can be issued by a mode operating brigade or battalion to its subordinate units if the operational environment dictates. A TMR and the corresponding TMR number assist in providing a theater with visibility and tracking of transportation movement missions as well as the availability of transportation assets. Figure B-1, on page B-2, shows an example of a TMR from Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II).

The TC-AIMS II program provides automated support to functions performed by a wide range of users. These functions include: unit move, theater operations, convoy planning and highway regulations. TC-AIMS II facilitates planning and execution of unit movements and enables movement control elements (MCEs) to manage and coordinate transportation services. For more information on TC-AIMS II visit the automated movement and identification solutions website.

HOW TO COMPLETE A TRANSPORTATION MOVEMENT RELEASE

B-1. The TMR number entry field is usually a ten to fourteen-position alphanumeric entry.

B-2. Each theater should have published guidance for TMR procedures that should also include codes for establishing the TMR number. Codes are locally generated unless prohibited by command policy. The following is general information (as an example) used to establish a TMR number:

- The first two positions of the TMR number identify the origin MCE code. It is the MCE code of the organization creating the TMR.
- The third position of the TMR number is the month code. The month code will be the month code of the requested spot date.
- Positions four through seven are the sequence numbers. These numbers are given to each TMR for its own unique identity.
- Positions eight and nine are the destination's MCE.
- Position ten is the stop sequence. Stop sequences: S=single, M=multiple.
- Positions eleven and twelve identify the special interest code; for example, RO=reefer van
- Position thirteen, the mode method code. The mode method code is the code of the mode method assigned to the TMR.
- Position fourteen is the transportation priority: 1, 2, or 3.

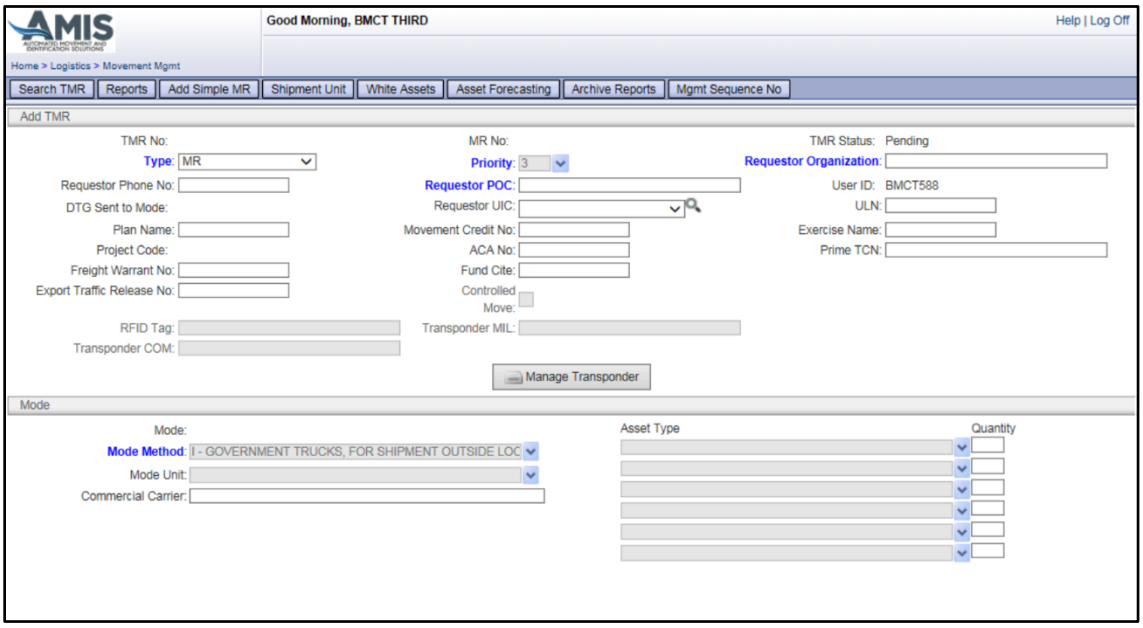

Figure B-1. Transportation movement release in TC-AIMS II

TRANSPORTATION MOVEMENT RELEASE ASSOCIATED DOCUMENTATION DESCRIPTIONS

B-3. Once the TMR number has been generated, TC-AIMS II will generate required fields to be completed before a TMR can be submitted (see figure B-1). The following are a brief description of fields—

- The Movement Request Control No. (number) entry is used to identify the movement request associated with the TMR.
- The Requestor Organization entry is used to identify the organization requesting the movement.
- The Requestor POC (point of contact) entry is used to enter the name of the POC for the unit requesting the transportation.
- The Requestor Phone No. (number) entry is used to enter the telephone number of the POC for the unit requesting the transportation.
- The Prime TCN (transportation control number) entry should be a seventeen-position entry. Positions 1 through 6 are the Consignor Department of Defense Activity Address Code (DODAAC). Positions 7 through 10 are the four-position Julian date of when the request was created. Positions 11 through 14 are the serial number and positions 15 through 17 are all Xs.
- The DTG (date time group), the TMR Sent to Mode entry is the date the TMR was provided to the Mode unit delivering the cargo or passengers.
- The ACA No. (airlift clearance authority number) entry is used to enter the airlift clearance authority number for cargo being shipped by air.
- The Movement Credit No. (number) entry is used to enter the Movement Credit number for a convoy issued by the clearance authority.
- The Export Traffic Release No. (number) entry is issued by the ocean cargo clearance authority to authorize cargo to be exported.
- The Freight Warrant No. (number) entry is the freight warrant number of cargo assigned to the TMR.
- The Exercise Name entry is used to associate movements to a specific exercise.
- The Project Code entry is used to depict the TMR is in support of a specific exercise.
- The Fund Cite entry identifies a fund citation associated with a movement.

MODE INFORMATION ENTRY DESCRIPTIONS:

B-4. The following are mode information entry descriptions—

- The Mode Method Code entry is the mode method used to ship the cargo.
- The Mode Unit entry identifies the military mode unit that is assigned to the movement.
- The Commercial Carrier entry is the code for the commercial carrier assigned to the movement.
- The Asset Type entry is the code for the asset assigned to the movement.
- The Quantity entry is the number of assets assigned to the movement.

ORIGIN PICK-UP LOCATIONS ENTRY DESCRIPTIONS

B-5. The following are pick-up location entry descriptions (see figure B-2)—

- The origin DODAAC (Department of Defense Activity Address Code) entry is the DODAAC of the consignor where the cargo or passengers are to be picked up.
- The origin MCE entry is the MCE code supporting the consignor where the cargo or passengers are to be picked up.
- The origin unit POC (point of contact) entry identifies the POC of the consignor.
- The origin POC Phone entry is the phone number of the origin POC.
- The origin city entry is the city where the cargo or passengers are to be picked up.
- The origin Installation entry is the installation where the cargo or passengers are to be picked up.
- The Mode provides choices to identify the type of cargo.
- The origin Street Address entry is the street address or building number where the cargo or passengers are to be picked up.

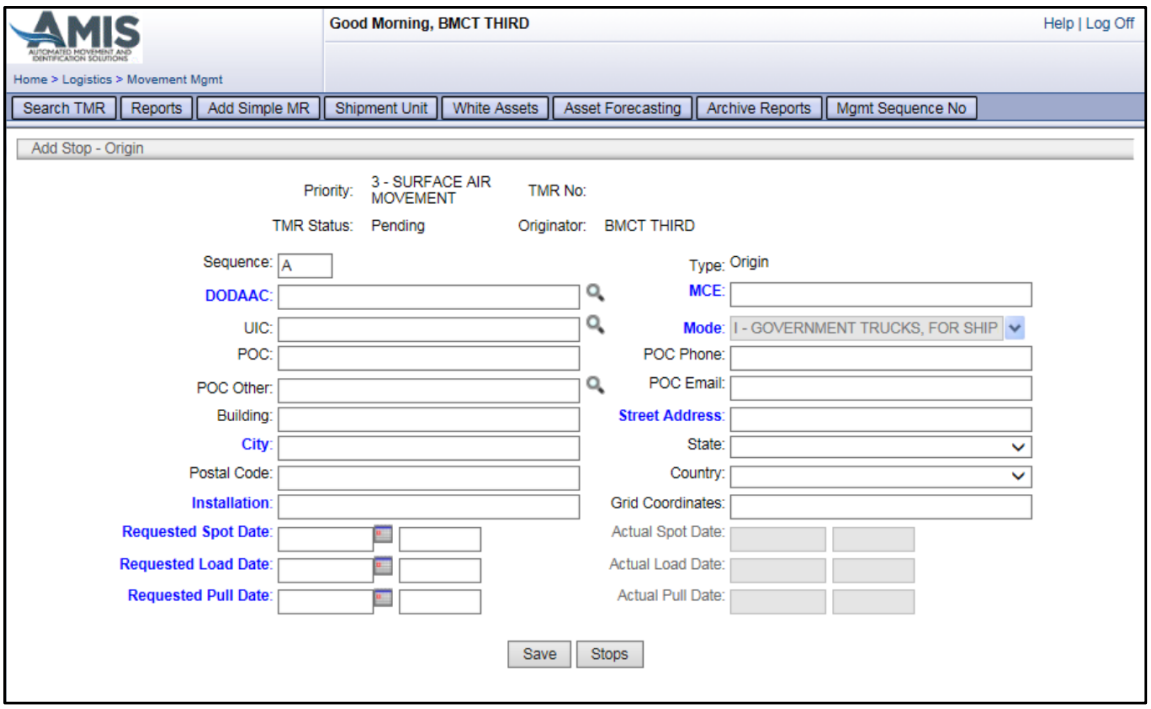

Figure B-2. Origin pick-up locations entry in TC-AIMS II

REQUESTED SPOT, LOAD, AND PULL INFORMATION ENTRY DESCRIPTIONS

B-6. Information for requested spot, load and pull follows—

- The Requested Spot Date entry is the day the customer wants the asset spotted at the consignor.
- The Requested Load Date entry is the date requested by the shipper that the asset be loaded.

- The Requested Pull Date entry is the date requested by the shipper the asset be pulled from the consignor.

DESTINATION LOCATIONS ENTRY DESCRIPTIONS

B-7. The destination stop-off Sequence entry should be a one-position alphabetic entry. If the movement is a single stop movement such as one consignee, the user will enter an "S". If the movement is a multi-stop movement such as more than one consignee, an "A" will be entered for the first stop and a "Z" for the last stop. A four stop movement request would have A, B, C, and Z stops. For a multi-stop movement, all letters may be used except O, S, and I. The following entries (see figure B-3) support establishing destinations—

- The destination DODAAC (Department of Defense Activity Address Code) entry is the DODAAC of the organization where the cargo or passengers will be delivered.
- The destination MCE code entry is the MCE supporting the consignee where the cargo or passengers are to be delivered.
- The destination unit POC entry identifies the POC of the consignee.
- The destination POC Phone number entry is the phone number of the destination POC.
- The destination City entry is the city where the cargo or passengers are to be delivered.
- The destination Installation entry is the installation where the cargo or passengers are to be delivered.
- The destination Street Address entry is the street address or building number where the cargo or passengers are to be delivered.
- The destination Grid Coordinates entry is the grid coordinate where the cargo or passengers are to be delivered.
- The PIC (positive inbound clearance) required entry indicates if a positive inbound clearance is required.
- The PIC Date entry is the date that the PIC was received from the destination MCT.
- The PIC POC entry is the name of the point of contact with whom the PIC was confirmed.
- The PIC Phone entry is the phone number of the point of contact with whom the PIC was confirmed.
- The RDD (Required Delivery Date) entry is the date that the cargo or passengers must be delivered.

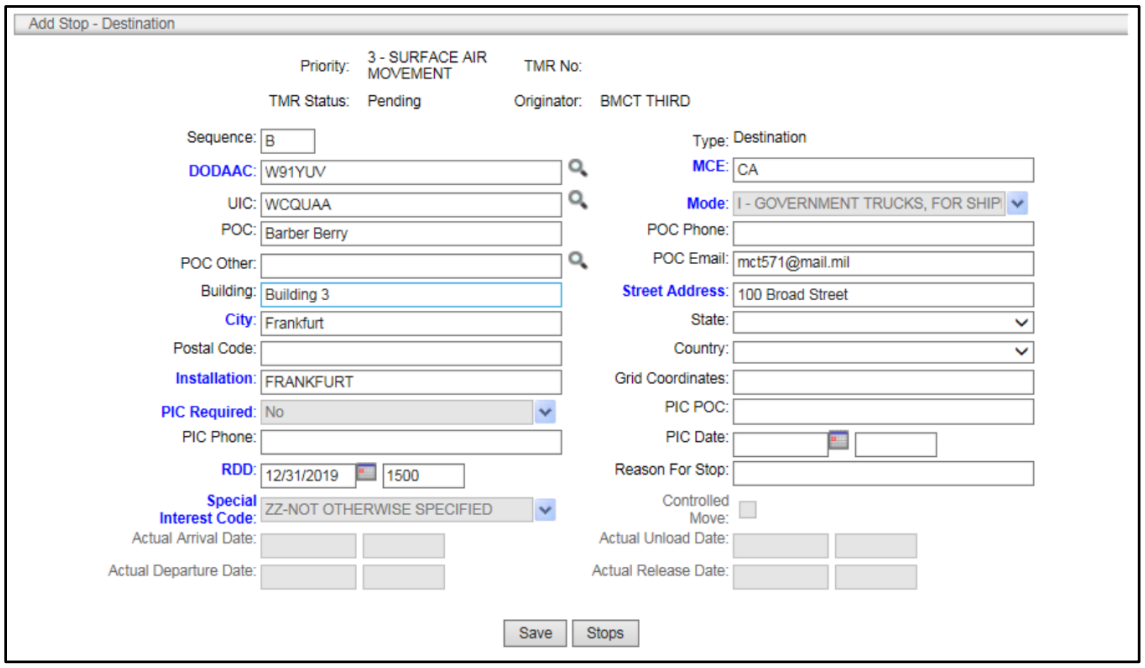

Figure B-3. Destination locations entry in TC-AIMS II

CARGO ENTRY DESCRIPTIONS

B-8. See figure B-4 on page B-6 for an illustration of cargo delivery entry descriptions. The following are cargo entry descriptions—

- The TCN (transportation control number) entry identifies the TCNs of the cargo to be picked up.
- The Water CC (commodity code) entry is the commodity code of the cargo to be picked up.
- The Type Cargo Code entry identifies certain types of cargo, primarily those that are hazardous.
- The Water SHC (special handling code) entry indicates the type of special handling required by an item to ensure proper transportation without damage to the item, its surroundings, or its security.
- The Air CC (commodity code) entry is the commodity code of the cargo to be picked up.
- The Air SHC (special handling code) entry indicates the type of special handling required by an item to ensure proper transportation without damage to the item, its surroundings, or its security.
- The origin NSN (national stock number) entry identifies the national stock number of the cargo to be picked up.
- The Compatibility Grp (group) entry identifies the compatibility code of the hazardous cargo to be picked up.
- The UN/HzItm ID (United Nations Hazardous Class Code and Division Number) entry identifies the United Nations class code/division number of the hazardous cargo to be picked up.
- The Supply Class entry identifies the supply class of the cargo to be picked up.
- The Pieces entry is the total number of pieces for the shipment unit that is being picked up.
- The Weight entry is the total weight of the shipment unit that is being picked up.
- The Cube entry is the total cubic feet of the shipment unit that is being picked up.
- The Length entry is the total length of the largest piece of cargo being picked up when the cargo is outsized.
- The Width entry is the total width of the largest piece of cargo being picked up when the cargo is outsized.

- The Height entry is the total height of the largest piece of cargo being picked up when the cargo is outsized.
- The Container No (number) entry identifies the number of the container being picked up.
- The Pallet ID (identification) entry identifies the pallet being picked up.

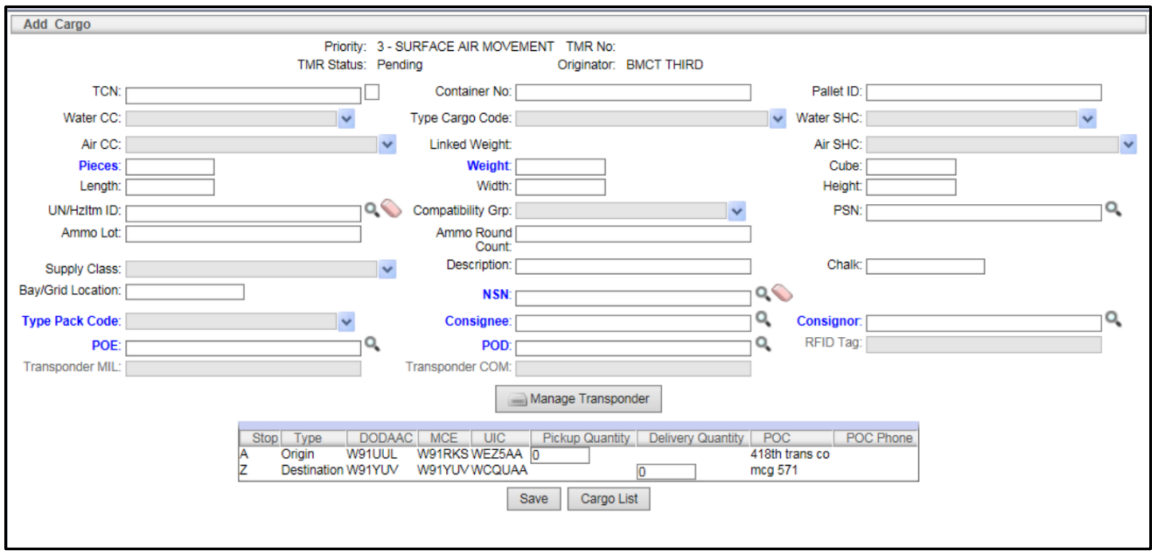

Figure B-4. Cargo entry in TC-AIMS II

Appendix C

Road Movement Planning

This appendix covers elements of road movement planning. These elements are route movement planning factors, graphing, planning for route restrictions, preparing movement tables for highway movement, and road management planning.

ROUTE MOVEMENT PLANNING FACTORS

C-1. Synchronizing route movement requires deliberate planning to implement an effective plan. The following factors are necessary to plan and execute road movements in support of the theater distribution network:

- Movement measurement.
- Time and distance.
- Time, distance, and rate calculations.
- Arrive and clear time calculations.

MOVEMENT MEASUREMENT

C-2. Movements are measured by calculating how long it takes to move a given distance. The three methods of measurement are speed, pace, and rate of march. Movement planners normally use rate of march in performing movement calculations:

- Speed is the actual rate at which a vehicle is moving at a given time as shown on the speedometer. It is expressed as kilometers or miles per hour.
- Pace is the regulated speed of a convoy or an element as set by a lead vehicle, the pacesetter. It is constantly adjusted to suit road, terrain, and weather conditions. Pace is also expressed as kilometers or miles per hour.
- Rate of march is the average number of kilometers or miles traveled in any specific time period. It includes short periodic halts and short delays, but it does not include long halts, such as those for consuming meals or for overnight stops. It is expressed in kilometers or miles in the hour.

TIME AND DISTANCE FACTORS

C-3. Time and distance factors (see figure C-1 on page C-3) are used to perform a wide range of calculations for planning route movements. They can be used to conduct detailed planning or to develop movement tables. They can also be used to conduct expedient planning and calculating to manage movement request.

Time Factors

C-4. Time is expressed in hours or minutes. The terms used to describe time factors are as follows—

- Pass time (or time length) is the time required for a column or its elements to pass a given point on a route.
- Time space is the time required for a column or its elements to pass any given point on a route plus any additional time (safety factor) added to the pass time.
- Time gap is the time measured between vehicles, march units, serials, or columns as they pass a given point. It is measured from the trail vehicle of one element to the lead vehicles of the following element.
- Time lead is the time measured between individual vehicles or elements of a column, measured from head to head, as they pass a given point.

- Time distance is the time required for the head of a column or any single vehicle of a column to move from one point to another at a given rate of march.
- Road clearance time is the total time a column or one of its elements requires to travel the road distance and clearance point along the route or the RP. Road clearance time equals the column's pass time or time space plus time distance.

Distance Factors

C-5. Distance factors are expressed in kilometers or meters. The terms used to describe distance factors are as follows—

- Length of any column or element of a column is the length of roadway that it occupies. It is measured from the front bumper of the lead vehicle to the rear bumper of the trail vehicle and includes all gaps inside the column.
- Road space is the length of a column, plus any additional space (safety factor) added to the length to prevent conflict with preceding or succeeding traffic.
- Gap is the space between vehicles, march units, serials, and columns. It is measured from the trail vehicle of one element to the lead vehicle of the following element. The gap between vehicles is normally expressed in meters. The gap between march elements is normally expressed in kilometers.
- Lead is the space between the heads of elements in a convoy or between heads of successive vehicles, march units, serials, or columns.
- Road distance is the distance from point to point on a route, normally expressed in kilometers.
- Road clearance distance is the distance the head of a column must travel for the entire column to clear the RP or any point along the route. Road clearance distance equals the column's length or road space plus road distance.

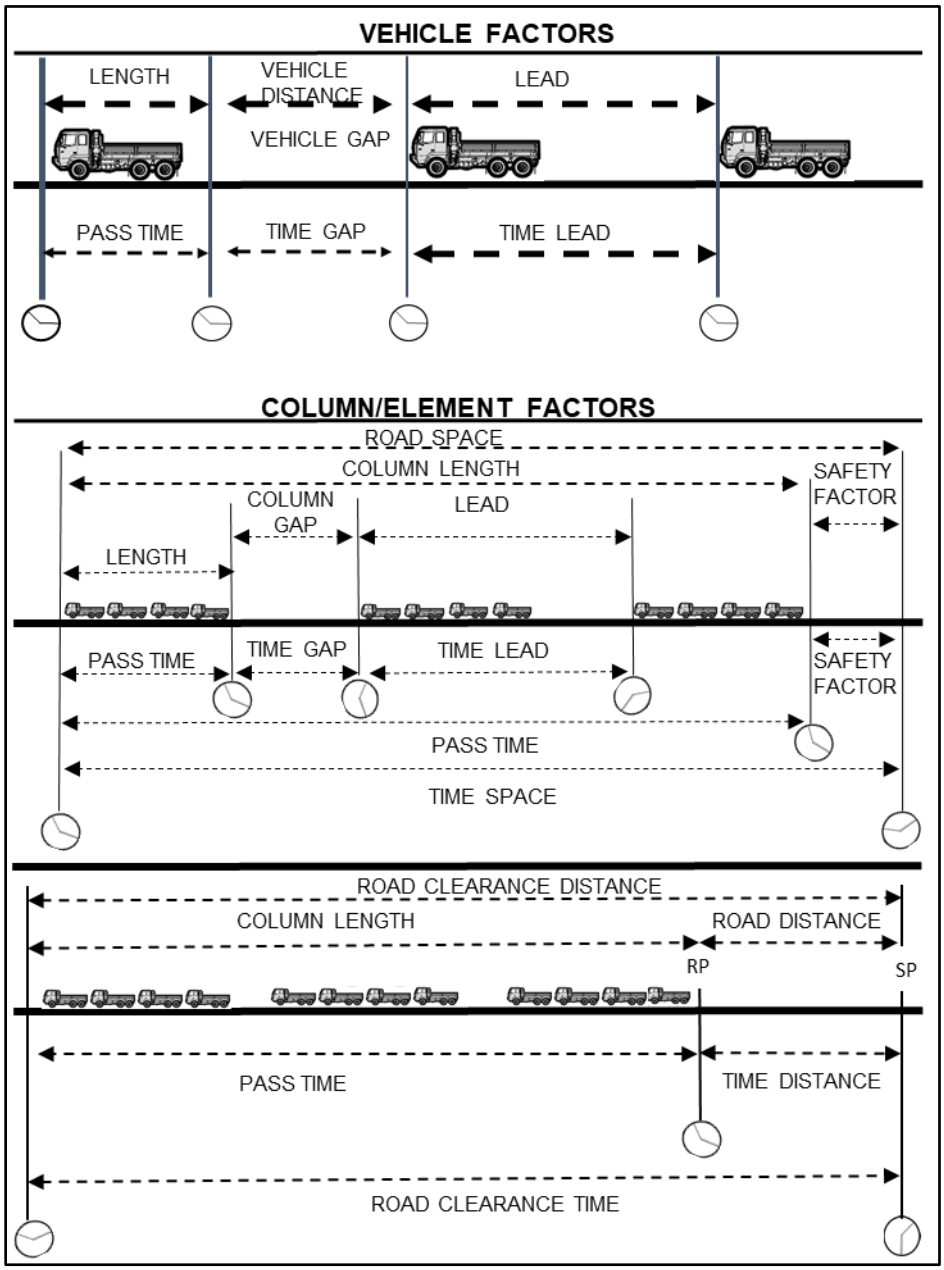

Figure C-1. Time and distance factors

TIME, DISTANCE AND RATE CALCULATIONS

C-6. Time, distance, and rate factors are used to make scheduling calculations for columns of any size. When two of the three factors are known, the third can be found by using one of following equations as shown in figure C-2 on page C-4.

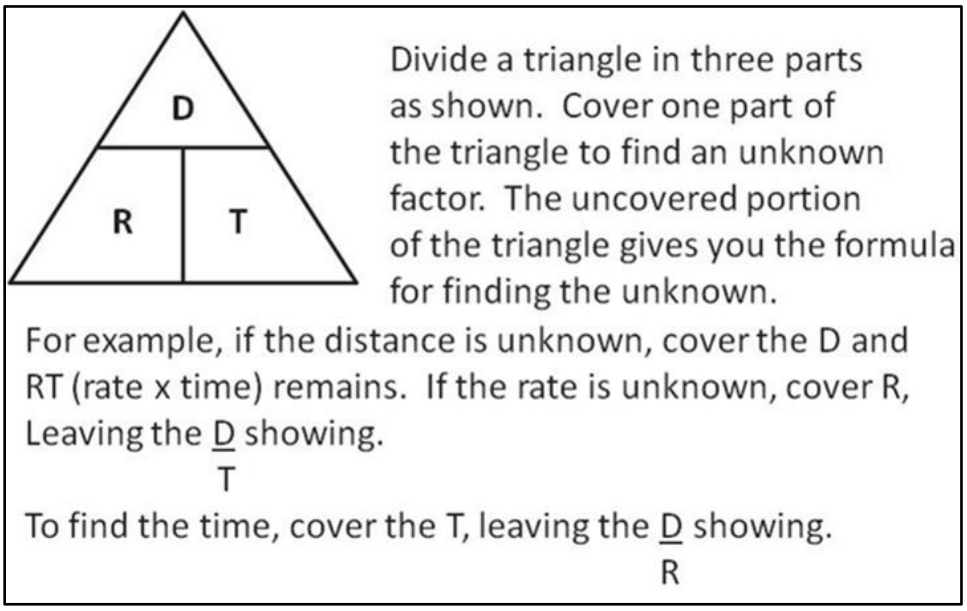

Figure C-2. Finding an unknown factor of time, distance or rate

- Determining Time. Time equals distance divided by rate. If the distance is 210 km and the rate of march is 42 km/h, the time is 5 hours: 210 ÷ 42 = 5.
- Determining Distance. Distance equals rate multiplied by time. If the rate of march is 40 km/h and time is 4 hours, the distance is 160 km: 40 x 4 = 160.
- Determining Rate. Rate equals distance divided by time. If a convoy travels for 5 hours to complete a 190 km trip, its rate of march is 38 km/h: 190 ÷ 5 = 38.

ARRIVE AND CLEAR TIME CALCULATIONS

C-7. To manage movements on MSR by using location or column scheduling, movement control organizations can use an expedient method of planning and calculating. Both requestors and movement control organizations must understand and apply time and distance factors associated with the movement of convoys on MSRs. Moving units must make calculations as part of their movement planning and movement requests.

C-8. The minimum essential information needed is the arrive and clear times at SPs, intermediate CPs, and RPs. Therefore, theater standard operating procedures should specify a clearance request format that requires requesting units to calculate these arrive and clear times. The DTO or MCB may have to perform these calculations for large unit movements or special movements. They should check the accuracy of unit requests.

C-9. Use time, distance, and rate factors to calculate arrive and clear times. The arrive time is the time the first vehicle in the column will reach an SP, CP, or RP. The arrive time is derived from calculating the time distance. The clear time is the time the last vehicle in the column will clear that SP, CP, or RP. The clear time is derived from calculating the pass time.

C-10. Calculate arrive times as follows—

- To calculate the arrive time at the first CP (see figure C-3), take the distance from the SP to the first CP, divide by the planned rate of march, and multiply by 60 minutes.

Example	Distance from SP to first CP – 8 km March rate – 30 km/h
Solution	8 ÷ 30 = .26 hours x 60 = 16 minutes If the SP time is 0800, then the arrival time at the first CP will be 0816

Figure C-3. Calculating arrive times (first check point)

- To calculate the arrive time at the second check point (see figure C-4), take the distance from the first check point to the second check point, divide by the rate of march, and multiply by 60.

Example	Distance between CPs – 9 km March rate – 30 km/h
Solution	9 ÷ 30 = .30 hours x 60 – 18 minutes If the arrival time at the first CP is 0816, then the arrival time at the second CP will be 0834.

Figure C-4. Calculating arrive times (second check point)

Note. Continue this method to calculate the arrive time at the succeeding check points through the release point.

- To calculate the clear times at each check point, planners must determine the pass time. Calculating pass time requires calculations for density (figure C-5), time gaps (figure C-6 on page C-6), road space (figure C-7 on page C-6), and pass time (figure C-8 on page C-6).

Density =	$\frac{1{,}000 \text{ (meters)}}{\text{gap + average length of vehicle}}$
Example	If the gap is 50 meters and the average length of the vehicle in the column is 9 meters, then:
Density =	$\frac{1{,}000}{50+9} = \frac{1{,}000}{59} = 16.94$ = 17 vehicles per km

Figure C-5. Calculating pass times (density)

Time Gaps =	([number of march units – 1]) x march unit time gap) + ([number of serials – 1] x [serial time gap – march unit time gap])
Solution =	([5 – 1) x 30 minutes) + ([3 -1] x [45 minutes – 30 minutes]) = 150 minutes

Figure C-6. Calculating pass times (time gaps)

Note. Time gaps = ([number of march units – 1] x march unit time gap) + ([number of serials – 1] x [serial time gap – march unit time gap]).

$$\frac{\text{number of vehicles}}{\text{density}} + \frac{\text{time gaps x rate}}{\text{60 minutes}}$$

Example

number of vehicles = 102
density = 17 per km
rate = 30 km/h
time gaps = 30 minutes

$$\text{road space} = \frac{102}{17} + \frac{30 \times 30}{60} = 6 + 15 = 21 \text{ km}$$

Figure C-7. Calculating pass times (road space)

$$\text{Pass Time} = \frac{\text{road space x 60}}{\text{rate}}$$

Example

Continuation from previous examples.

$$\text{Pass Time} = \frac{21 \times 60}{30} = \frac{1{,}260}{30} = 42 \text{ minutes}$$

Figure C-8. Calculating pass times (pass time)

C-11. The pass time at the SP is 42 minutes after the first vehicle crosses the SP. If the arrive time at the SP is 0800, the clear time at the SP will be 0842. If the arrival time at the first CP is 0816, the clear time at the first CP will be 0858. Use this same method to calculate the arrive and clear times at succeeding CPs to the RP.

C-12. The pass time will stay the same throughout the route as long as the march rate and density do not change. If the march rate or density changes, then recalculate the pass time to determine the new clear time. Calculations are simplified by—

- Preparing and using conversion tables for changing U.S. common distances to metric distances, number of vehicles to pass time, and distance to time.
- Standardizing variables to reduce calculation time. When possible, use standard march rates and density.
- Using automated programs to calculate arrive and clear times such as the military application program package.

GRAPHING

C-13. A movement graph is a method of graphically portraying movements along a single route. It shows the relationship between time and distance and highlights any conflicts between columns scheduled for movement on the route. Movement planners can use movement graphs during planning when conflicts are anticipated or when restrictions are applied to routes.

C-14. Movement graphs can be prepared on any type of graph paper. The vertical axis shows distance and the horizontal axis shows time. The lower left corner of the graph represents zero kilometers (or miles) and the earliest start time of the movement. The planner creating the graph must apply a scale to the vertical and horizontal axis as shown in figure C-9 on page C-8.

C-15. The scale of the vertical axis is a division of the total distance. The top number on the vertical axis is the greatest number of km (or miles) to be traveled by any element on the route. The distance scale shown in figure C-9 on page C-8 is 3 km per block.

C-16. The scale of the horizontal axis is a division of the total time. The time at the end of the horizontal scale shows the latest planning time to complete all movements planned for the route. The time scale shown in figure C-9 on page C-8 is 12 minutes per block.

C-17. Critical points along the route, such as built up areas, road junctions, and check points are shown along the vertical axis on the same scale as that of the graph. The start point and release point can also be annotated alongside the CP if all movements begin and end at the same CP.

C-18. The graph at figure C-9 on page C-8 shows the time and distance scales, critical points, CPs, and a plotted line representing the movement of one vehicle (or the first vehicle of a column) from the SP (Newport) to Jackson Heights. Based on the scale of each block representing 3 km and 12 minutes, the head of the convoy will leave Newport at 0400, travel 90 km to Jackson Heights, and arrive at 0700. Using the formula to determine march rate ($R = D \div T$) the march rate is 30 km/h.

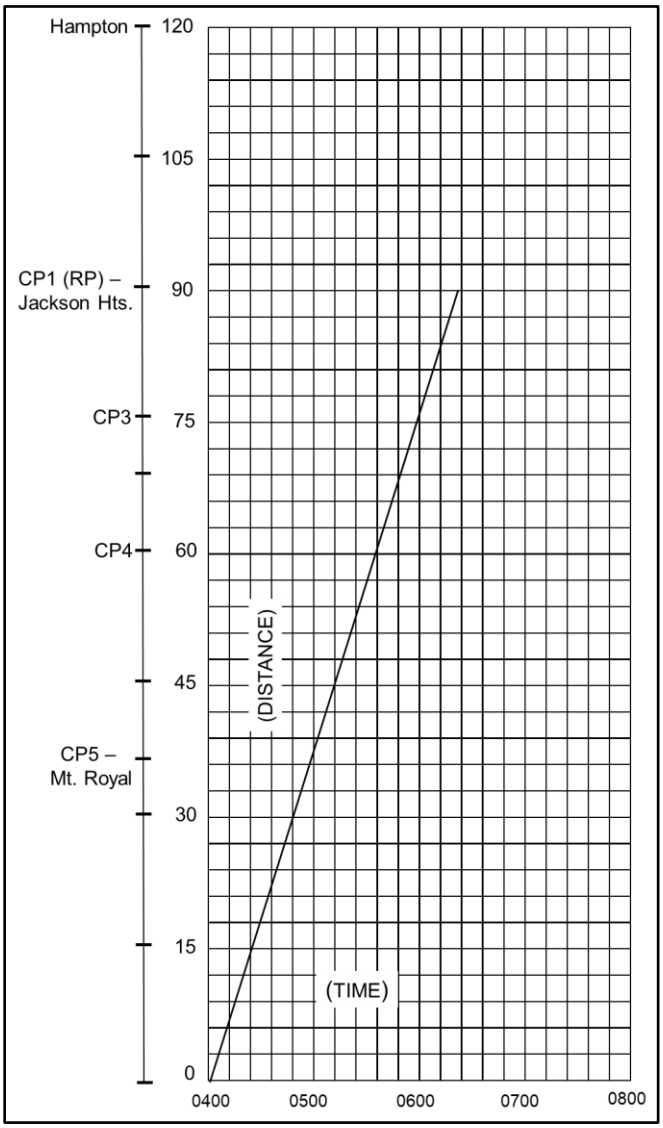

Figure C-9. Schedule of head column

C-19. March columns, serials, and march units are represented on a graph by parallel diagonal lines like the ones shown in figure C-10. The vertical space between the diagonal lines is the length of roadway (length) occupied by the column. It is measured along the vertical scale. The horizontal space is the time it takes for the column to pass any given point (pass time or time length).

C-20. The head of the column is plotted at the intersection of the SP on the vertical scale and start time on the horizontal scale. The clear time of the head of the column is plotted at the intersection of the RP on the vertical scale and the clear time on the horizontal scale.

C-21. The trail of the column is plotted at the intersection of the same SP on the horizontal scale. The trail vehicle's start time is calculated by adding the pass time to the start time of the first vehicle. The clear time of the trail vehicle is plotted at the intersection of the RP on the vertical scale and its clear time on the horizontal scale. The trail vehicle's clear time is calculated by adding the pass time to the clear time of the first vehicle.

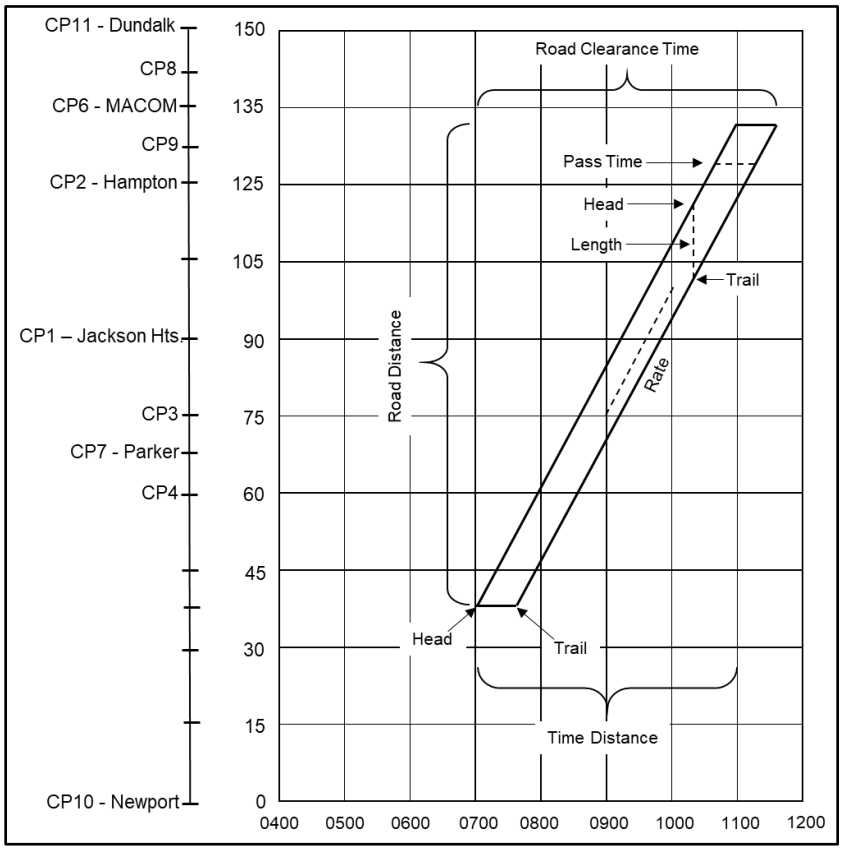

Figure C-10. March graph showing movement of a column

C-22. The graph now completely pictures the movement of one column. The vertical and horizontal scales reveal the following information—

- The two parallel diagonal lines show the head and the trail movements.
- The column's length is about 14 km.
- The pass time of the column is 36 minutes. That means that it will take 36 minutes for the column to clear any point along the route.
- The road distance from SP to RP is about 96 km. The time distance is 4 hours (0700 to 1100). That means it will take 4 hours for the head of the column to clear the RP.
- Road clearance time, calculated by adding the pass time to the time distance, is 4 hours and 36 minutes.
- Road clearance distance, calculated by adding the length to road distance, is 110 km.

C-23. March graphs are normally used to show multiple columns traveling over the same routes as shown in figure C-11 on page C-10. Each of these columns is explained below.

- Column A is scheduled to leave its SP (Newport) at 0400 and clear the SP at 0500, a pass time of 1 hour. Distance to the RP (Hampton) is 120 km. The rate of march is 30 km/h. The time distance is 4 hours (120 km ÷ 30 km/h). The head will arrive at the RP at 0800 and the trail at 0900. Therefore, the road clearance time is 5 hours, which is the time distance plus the pass time.
- Column B makes a shorter move at a different time. It is scheduled to leave its SP (Mount Royal) at 0700 and clear the CP at 0730, a pass time of 30 minutes. Distance to the RP is 48 km. The rate of march is 24 km/h. The time distance is 2 hours (48 ÷ 24 km/h). The head will arrive at the RP at 0900 and the trail at 0930. Therefore, the road clearance time is 2 1/2 hours. The graph shows that this move does not conflict with the first move.

Note. A crossroad lateral movement is scheduled to cross at CP 9 from 0906 until 1312. The graph shows that the lateral movement will not interfere with any of the scheduled moves.

- Column C makes a longer and slower move than the other columns. The graph shows this because the diagonal lines representing time distance are not as steep as the lines of columns A, B, and D. The steepness of a diagonal line on the graph indicates the rate of march. Column C is scheduled to leave its SP (Newport) at 0700 and clear the SP at 0750, a pass time of 50 minutes. Distance to the RP is 132 ÷ km. The rate of march is 18 km/h. Column C is also scheduled for a 1 hour rest halt on the road. Rest halt time is added to the time distance when calculating. Therefore, the time distance is 132 km ÷ 18 km/h + 1 hour or 8 hours and 20 minutes. The road clearance time is 9 hours and 10 minutes.
- Columns D-1 and D-2 are two serials of one column. They are scheduled to travel at 28 km/h from the same SP to the same RP, one leaving 24 minutes after the other. The graph shows that the head of Column D-1 is scheduled to leave the SP at 1400 and arrive at the RP at 1700, a distance of 84 km in 3 hours. The rate of march is 28 km/h (84 ÷ 3 hours). Because both elements of the move are shown on the graph parallel to each other, the rate is the same for both.
- Column E is a foot march on the route. It is traveling slowly (24 km in 6 hours of walking time).

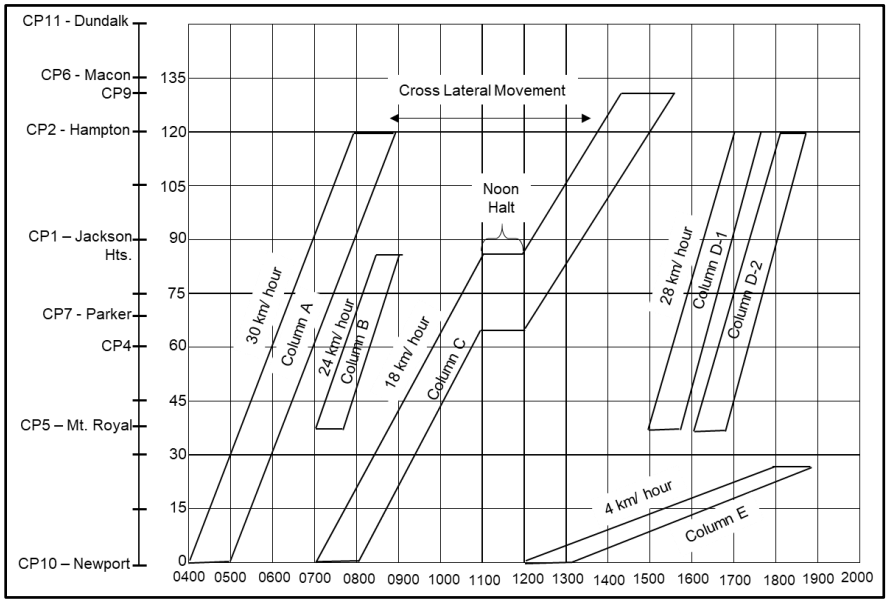

Figure C-11. Scheduling moves

PLANNING FOR ROUTE RESTRICTIONS

C-24. Planners must consider route restrictions when graphing movements. These restrictions normally add greater control measures to a route. They may be imposed to allow for route maintenance, large unit movements, or maneuver. They should be specified in route synchronization plans, OPORDs, or fragmentary orders.

C-25. Restrictions are marked on graphs by blocking out the time and space on the graph when traffic may not use a route or cross an intersection. To plan around restrictions, planners can calculate either earliest or latest time a column can leave the SP to miss the restriction.

C-26. When passing after restriction ends, use the following formula. Compute the earliest time the head of the column can cross the SP to clear the ending time of a route restriction without halting at the restriction.

C-27. The earliest time the first vehicle can cross the SP = end of restriction time + safety factor - time distance from start point to restriction point.

C-28. Example: A restriction is in effect from 1140 to 1240. The distance from the SP to the restriction is 32 km. A safety factor of 15 minutes is in force before and after the restriction. This is a close column move executed at the rate of 16 km/h. Pass time is 12 minutes. Using the formula, calculate the earliest time the first vehicle can cross the SP: 1240 + 15 min – 32 km/16 km/h = 1255 - 2hrs = 1055. The earliest time the column can leave the SP is 1055.

C-29. When passing before restriction begins, use the following formula. Compute the latest time the first vehicle of a column can cross the SP to have the last vehicle arrive at the 1140 to 1240 restriction before it begins.

C-30. The latest time the first vehicle of a column can cross the SP = beginning of restriction time - safety factor - time distance from SP to the restriction - time length. Using the data in the example in paragraph C-27 above, calculate the time: 1140 - 15 minutes - 32 km/16 km/h - 12 minutes = 1125 - 2 hrs - 12 minutes = 0913. The latest time the first vehicle can leave the SP is 0913.

PREPARING MOVEMENT TABLES FOR HIGHWAY MOVEMENT

C-31. This section provides a step-by-step example of how to compute a route movement, prepare a road movement graph, and prepare road movement tables for a convoy consisting of five serials.

CONVOY DATA

C-32. On 23 February, elements of the 439th Transportation Battalion will move from the unit's present position to an area near CP 106. The movement will consist of five serials, organized as shown in Table C-1. The first and second serials have six march units each; the third and fourth serials have seven march units each; and the fifth has five march units. The SP is CP 97, and the RP is CP 106. The route of march is from CP 97 to CP 106 by way of CPs 99, 103, 104, and 105. The lead vehicle of the first serial will cross the SP at 0800.

Table C-1. Organization of serial march units

SERIALS	*UNIT*	*NUMBER OF VEHICLES*	*NUMBER OF MARCH UNITS*
First	2439th and 2440th Transportation	126	6
Second	2441st and 2442d Transportation	135	6
Third	2443d and 2444th Transportation Companies and Headquarters and Headquarters Detachment, 439th Transportation Battalion	150	7
Fourth	2445th and 2446th Transportation Companies	144	7
Fifth	2447th and 2448th Transportation Companies (attached)	124	5

MOVEMENT CONDITIONS

C-33. Extracts of the route synchronization plan specify the following conditions on the movement:

- The rate of march during daylight hours is 24 km/h and the density of vehicles during daylight hours is 12 per km.
- The rate of march during hours of darkness (1835 to 0630) is 16 km/h and the density of vehicles during hours of darkness is 48 per km.
- Gaps will be 10 minutes between serials and 2 minutes between march units.
- When an en route restriction is applied to the movement, a 15-minute safety factor will be allowed before and after the restriction.

RESTRICTIONS

C-34. The following restrictions are in effect on 23 February:

- CP 99 to CP 103 from 1100 to 1200.
- CP 105 from 1500 to 1530.

- CP 104 from 1510 to 1630.
- CP 105 from 1700 to 1830.

ADDITIONAL GUIDANCE

C-35. The fourth serial will halt in place at the 1500 to 1530 restriction at CP 105 and will continue as soon as possible after the restriction. The head of the fifth serial will depart the SP as soon as possible to clear the restriction at CP 104. The fifth serial will stop at the 1700 to 1830 restriction at CP 105 and disperse vehicles until the restriction is lifted.

C-36. All computations in minutes resulting in a fraction are raised to the next full minute; km are rounded up to the nearest tenth. For example—

- 15.6 minutes - 16 minutes.
- 15.3 minutes - 16 minutes.
- 13.67 km = 13.7 km.
- 13.43 km = 13.5 km.

COMPUTING TIME AND DISTANCE OF THE ROUTE

C-37. The planner must first determine how long it will take each serial to travel from the SP to the RP, the time distance of the route.

- Formula. Compute the time distance by dividing the distance from the SP to the RP by the rate of march (TD = D ÷ R).
- Data. The distances between CPs and total distance are shown in figure C-12.

	Kilometers
CP 97 to CP 99	24
CP 99 to CP 103	6
CP 103 to CP 104	9
CP 104 to CP 105	18
CP 105 to CP 106	18
Total	75

Figure C-12. Distance

- Computation. The distance from SP to RP is 75 km. The lead vehicle will cross the SP at 0800 and the rate of march during daytime is 24 km/h. Substituting in the formula TD = D ÷ R, TD = 75 ÷ 24, or 3.125 hours. Since .125 hours is 8 minutes (.125 X 60), the time distance is 3 hours and 8 minutes.

COMPUTING ROAD SPACE OF THE FIRST SERIAL

C-38. Road space is the length of a column. The formula for computing road space is shown in figure C-13. Table C-1 shows 126 vehicles in the first serial. The rate of march is 24 km/h; the density is 12 vehicles per kilometer. The time gap is 2 minutes between march units. Because six march units make up the serial, there are five gaps making a total time gap in the serial of 10 minutes. The formula for computing road space for the first serial is shown in figure C-14.

$$\text{Road space} = \frac{\text{number of vehicles}}{\text{vehicle density}} + \frac{\text{time gaps x rate}}{\text{60 minutes}}$$

Figure C-13. Computing road space

$$\text{Road space} = \frac{126}{12} + \frac{10 \times 24}{60} = 10.5 + 4 = 14.5\text{km}$$

Figure C-14. Computing road space (first serial)

COMPUTING PASS TIME OF THE FIRST SERIAL

C-39. Pass time is the time required for a column to pass a point on the route. The formula for computing pass time is shown in figure C-15. Use the road space computed in figure C-14 (14.5 km) to compute pass time (figure C-16).

$$\text{Pass time} = \frac{\text{road space x 60}}{\text{rate}}$$

Figure C-15. Computing pass time

$$\text{Pass time} = \frac{14.5 \text{ km} \times 60 \text{ min}}{24 \text{ km/h}} = 36.3 \text{ or } 37 \text{ min}$$

Figure C-16. Pass time (first serial)

COMPUTING ROAD SPACE AND PASS TIME OF THE SECOND, THIRD, FOURTH, AND FIFTH SERIALS

C-40. Using the same formulas and methods of computation as for the first serial, compute the road space and pass time for the second serial (figure C-17 on page C-14), third serial (figure C-18 on page C-14), fourth serial (figure C-19 on page C-14), and fifth serial (figure C-20 on page C-14).

$$\text{Road space} = \frac{135}{12} + \frac{10 \times 24}{60} = 11.3 + 4 = 15.3 \text{ km}$$

$$\text{Pass time} = \frac{15.3 \times 60}{24} = 38.25 \text{ or } 39 \text{ min}$$

Figure C-17. Computing road space and pass time (second serial)

$$\text{Road space} = \frac{150}{12} + \frac{12 \times 24}{60} = 12.5 + 4.8 = 17.3 \text{ km}$$

$$\text{Pass time} = \frac{17.3 \times 60}{24} = 43.2 \text{ or } 44 \text{ min}$$

Figure C-18. Computing road space and pass time (third serial)

$$\text{Road space} = \frac{144}{12} + \frac{12 \times 24}{60} = 12.5 + 4.8 = 16.8 \text{ km}$$

$$\text{Pass time} = \frac{16.8 \times 60}{24} = 42 \text{ min}$$

Figure C-19. Computing road space and pass time (fourth serial)

$$\text{Road space} = \frac{124}{12} + \frac{8 \times 24}{60} = 10.3 + 3.2 = 13.5 \text{ km}$$

$$\text{Pass time} = \frac{13.5 \times 60}{24} = 33.7 \text{ or } 34 \text{ min}$$

Figure C-20. Computing road space and pass time (fifth serial)

PUBLISHING ROAD MOVEMENT TABLES

C-41. The road movement graph is a planning work sheet for movement planners. It is not normally disseminated to subordinate units or published in plans and orders. Information obtained from the graph is published in road movement tables.

PREPARING A ROAD MOVEMENT GRAPH

C-42. A road movement graph is a time and space diagram. After computing for a move, the planner can then discern where the plotted move will be executed. The following explains how to plot the move:

- Designating hours. From the lower left corner across the bottom of the graph designate the time needed for the movement. Since the first serial is to arrive at the SP at 0800, the timing of this graph should start at 0800 in the lower left corner. The computations performed in paragraphs C-36, C-37, and C-38 show that more than 12 hours are required to complete the movement of the five serials. This is derived from adding the time distance, sum of pass times, restricted times, and gaps. Therefore, the time of this graph must extend to at least 2100. In this example, each horizontal block represents 12 minutes and every six blocks represents 1 hour as shown in figure C-21.

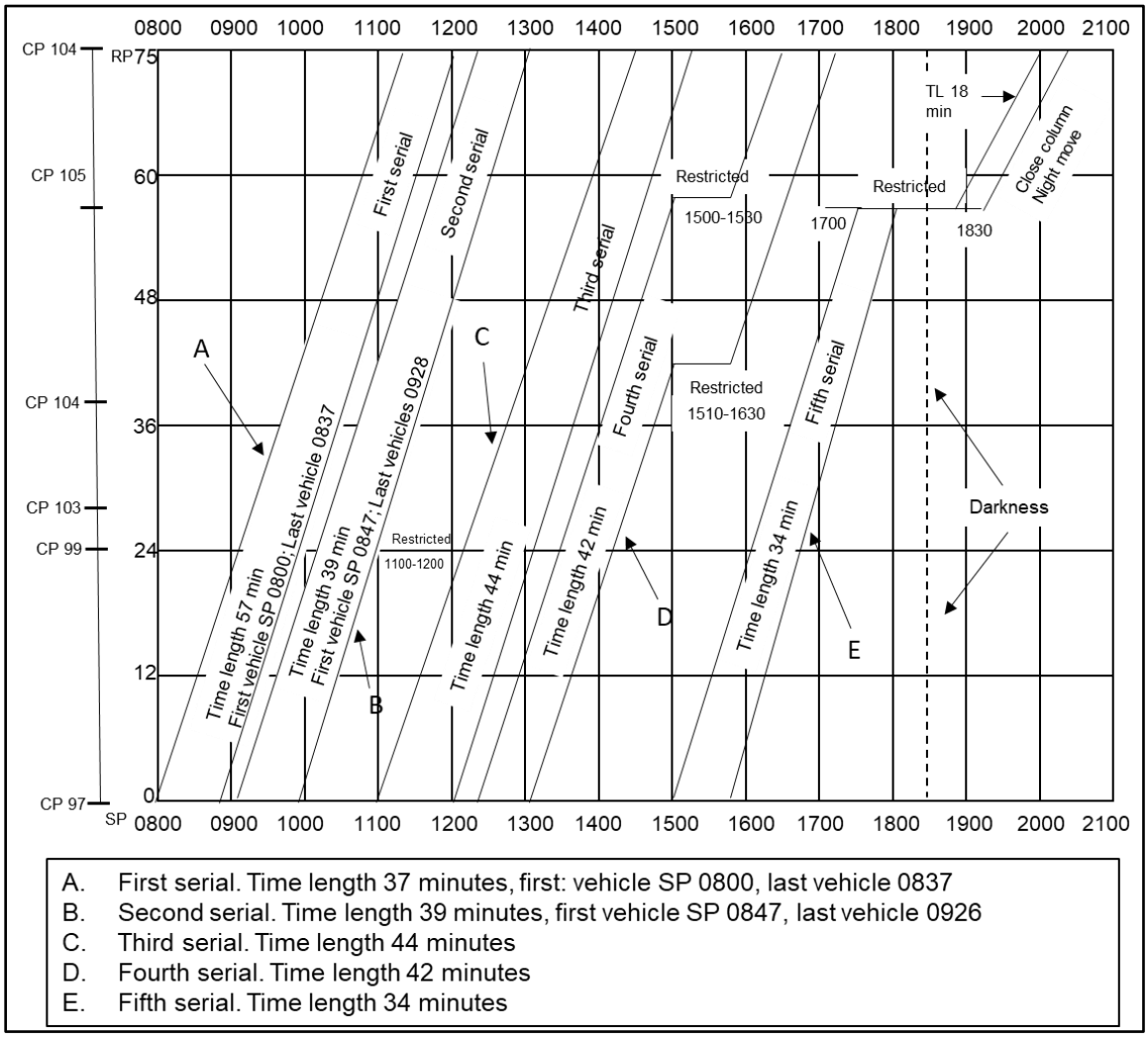

Figure C-21. Road movement graph for five serials

- Designating kilometers. Indicate the distance to be moved in kilometers on the vertical axis. Begin at the SP in the lower left corner of the graph with 0 km. Since this move is 75 km, the top of the vertical axis should be marked as 75 km. In this example, each vertical block between 0 and 75 km represents 1.5 km as shown in figure C-21. It is important to show critical points, check points, or other important points directly opposite the correct distance blocks of the graph. For example, CP 99 is 24 km from the SP and is noted on the scale opposite the 24 km line. CP 103 is noted on the scale opposite the 30 km line.
- Plotting the restrictions. Mark route restrictions within the graph as described below:
  - The first restriction is from CP 99 to CP 103 between 1100 and 1200. CP 99 is 24 km (16 blocks) from the SP and CP 103 is 6 km (4 blocks) from CP 99. To show the restriction, the time from 1100 to 1200 between CP 99 and CP 103 is blocked out.
  - The second restriction is at CP 105 between 1500 and 1530. CP 105 is at the 57 km point. In this example, the restriction is only at the CP. To show the restriction, a horizontal line from 1500 to 1530 at the CP is marked. It extends horizontally from 1500 over three blocks (30 minutes).
  - The third and fourth restrictions are also only at the CP. They are shown as above.

GRAPHING THE FIRST SERIAL

C-43. Once the hours, kilometers, and restrictions are marked on the graph, plot the serials. The first vehicle of the first serial is scheduled to leave the SP at 0800. Put a dot at the beginning of the 0800 line in the lower left corner of the graph. Figure C-21 on page C-15 shows the first vehicle is to arrive at the RP at 1108. This was calculated by adding the time distance (3 hours and 8 minutes) to the time the first vehicle crosses the SP. Locate the 1108 hour line at the top of the graph at the RP (75 km line) and put a dot there and then connect the dots.

C-44. The next step is to plot the trail (last vehicle) of the first serial. To find the time the last vehicle crosses the SP, add the pass time to the time the first vehicle crosses the SP. As determined when computing time and distance to the route, the pass time of the first serial is 37 minutes. Therefore, adding 37 minutes to 0800 gives 0837 as the time the last vehicle of the first serial leaves the SP. Make a dot at 0837 on the bottom of the graph. Then add the time distance of 3 hours and 8 minutes to 0837 start time to compute the time the last vehicle clears the RP. This is 0837 plus 3 hours and 8 minutes, or 1145. Make another dot at the top of the graph at 1145. Connect the dots. This second line parallels the first line drawn, which shows the movement of the first vehicle of the first serial. The horizontal space between the two lines represents the 37-minute pass time of the serial.

GRAPHING THE SECOND SERIAL

C-45. Because the last vehicle of the first serial is scheduled to clear the SP at 0837 and a 10-minute time gap is required between serials, the second serial cannot begin movement until 0847. To show the first vehicle of the second serial on the graph, place a dot at 0847 on the bottom of the graph. The time distance for the second serial is the same as that of the first serial. Therefore, the trail vehicle of the second serial will clear the RP at 1155 (0847 plus 3 hours and 8 minutes). To show the last vehicle of the second serial on the graph, place a dot at 1155 at the top of the graph at the RP and connect the dots with a line.

C-46. Plot the trail vehicle of the second serial the same as the first serial. To find the time the last vehicle of the second serial crosses the SP, add the pass time of the second serial to the time the first vehicle of the second serial crosses the SP. From figure C-17 on page C-14, this was determined to be 39 minutes. Therefore, adding 39 minutes to the 0847 SP time gives 0926 as the time the trail vehicle of the second serial leaves the SP. Make a dot at 0926 on the bottom of the graph. Since the first vehicle clears the RP at 1155 and the pass time is 39 minutes, the trail vehicle will clear the RP at 1234 (1155 plus 39 minutes). Make another dot on the top of the graph at 1234. Connect the two dots. The second serial is now complete.

GRAPHING THE THIRD SERIAL

C-47. Graphing the third serial is more complicated than the first two. The reason is that the third serial will not be able to clear the SP 10 minutes after the second serial clears the SP because this would cause it to run

into the 1100 to 1200 restriction at CP 99. Therefore, compute for the earliest time the first vehicle can leave in order to pass the restriction after the restriction ends at 1200 (plus the 15-minutes safety factor). As shown in figure C-21 on page C-15, the computation is 1200 (time the restriction ends) plus 15-minute safety factor minus 1 hour (time distance to the restriction [24 km at 24 km/h]) equals 1115. This time (1115) is the earliest time the first vehicle of the third serial can leave the SP. Place a dot at 1115 to show this SP time. Time distance is still 3 hours and 8 minutes. Therefore, the first vehicle of this serial will clear the RP at 1423. Put a dot at 1423 at the top of the graph and connect the two dots.

C-48. Since pass time for this serial is 44 minutes, the last vehicle will leave the SP at 1159. Time distance is still 3 hours and 8 minutes. Adding this to the starting time of the trail of the serial gives the clear time for the trail at the RP of 1507. Place dots at the times computed for the trail and connect them as with the two previous serials.

GRAPHING THE FOURTH SERIAL

C-49. Graphing the fourth serial is also more complicated than the others because it must halt at the 1500 to 1530 restriction at CP 105. The first step is to compute the time distance from the SP to the restriction. The distance is 57 km and the rate is 24 km/h. Using the formula to calculate time distance, TD = D ÷ R, 57 ÷ 24 = 2 hours and 23 minutes. Because the last vehicle of the third serial cleared the SP at 1159 and a 10- minute gap is required between serials, the fourth serial cannot begin movement until 1209.

C-50. The first vehicle of this serial will arrive at the restriction (CP 105) 2 hours and 23 minutes after it clears the SP, or 1423. Adding the pass time of this serial (42 minutes) to this gives 1514 as the time when the trail vehicle of the serial would clear CP 105 if it moved on without stopping. Since the restriction at this point is from 1500 to 1530, the column must halt at CP 105 and cannot move on until 15 minutes (safety factor) after the restriction ends. Thus the serial begins moving again at 1545.

C-51. The remaining distance of 18 km will take 45 minutes (18 km ÷ 24 km/h), so the lead vehicle clears the RP at 1630. The trail vehicle leaves CP 105, 42 minutes after the lead vehicle at 1627 and clears the RP, 45 minutes later at 1712.

GRAPHING THE FIFTH SERIAL

C-52. For the fifth serial, as with the third serial, a 10-minute time gap will not work because the fourth serial will be halted on the road for the restriction at CP 104. If the fifth serial was to leave 10 minutes after the fourth serial cleared the SP, it would run into the fourth serial at its halt.

C-53. Therefore, compute the earliest time the lead vehicle can leave the SP in order to avoid running into the fourth serial at CP 104. As described in paragraph C-31, first find how long it takes the lead vehicle to travel the 39 km to CP 104: 39 km ÷ 24 km/h = 1 hour and 38 minutes. The restriction at CP 104 is in effect from 1510 to 1630. Adding the 15-minute safety factor, 1645 is the earliest time at which the lead vehicle of the serial can clear the restriction. Subtracting 1 hour, 38 minutes from 1645 gives 1507 as the earliest time the fifth serial can leave the SP. It will clear the CP 104 at 1645 without halting.

C-54. Another problem arises at this point. If the fifth serial leaves at 1507, it will arrive at CP 105 at 1730, 45 minutes after clearing CP 104. Since there is a 1700 to 1830 restriction at CP 105, the serial must halt and wait until 1845 to resume movement. Because this serial has been ordered to disperse off the road at CP 105, the halt is shown differently than with the fourth serial, which halted on the road and occupied road space.

C-55. The pass time of the serial must also be recomputed from this point since the movement instructions specified that a slower march rate and larger density apply to movements during darkness after 1835. Accordingly, the rate of march becomes 16 km/h, and vehicle density becomes 48 vehicles per kilometer. To find the new pass time, first calculate the new road space see figure C-22 on page C-18. To recalculate the new pass time see figure C-23 on page C-18.

$$\text{Road space} = \frac{\text{number of vehicles}}{\text{vehicle density}} + \frac{\text{time gaps}}{60 \text{ minutes}} \times \text{rate}$$

$$= \frac{124}{8} + \frac{16}{2.6} + 2.2 = 4.8\text{km}$$

Figure C-22. Calculating new road space

C-56. Traveling at 16 km/h, it takes the lead vehicle 1 hour and 8 minutes to travel the remaining 18 km to the RP. It arrives there at 1953 (1845 + 1 hour and 8 minutes). The trail vehicle leaves CP 105, 18 minutes later than the lead vehicle, or at 1903; and arrives at the RP at 2011.

$$\text{Pass time} = \frac{\text{road space}}{\text{rate}} \times 60 \text{ min} = \frac{4.8 \times 60}{16} = 18 \text{ min}$$

Figure C-23. Recalculating new pass time

USING A ROAD MOVEMENT TABLE

C-57. Data is taken from the graph and put into a road movement table, which can be issued as an annex to an OPORD for a road movement. Convoy commanders can use the information to track their progress during movement and ensure they arrive and clear each CP on schedule. Movement regulation teams, traffic control posts, and others can use the information for control purposes.

C-58. Table C-2 and Table C-3 on pages C-18 through C-20 show the front and back sides of a sample road movement table. The data in this table is derived from the information found on the graph in figure C-21 on page C-15.

Table C-2. Road movement table-front

							Check Point (CP)				
Serial and Date	Units	# of Vhcls	Load class of Hvy Vhcls	From - To	Rte	Rte to SP	Ref	Due hrs	Clear hrs	Ret from RP	Remark
a	b	c	d	e	f	g	h	i	j	k	l
1 23 Feb	2439 Trans Co (Lt Trk) 2440 Trans Co (Lt Trk)	126	21	CP97-CP106	A	N28	CP97 CP99 CP103 CP104 CP105 CP106	0800	0837	N16	
2 23 Feb	2441 Trans Co 2443 Trans Co (Lt Trk)	135	21	CP97 – CP106	A	N45	CP97 CP99 CP103 CP104 CP105 CP106	0847 0947 1002 1025 1110 1155	0926 1026 1041 1104 1149 1234	N14	

Table C-2. Road movement table-front *(Continued)*

Serial and Date	Units	# of Vhcls	Load class of Hvy Vhcls	From - To	Rte	Rte to SP	Ref	Due hrs	Clear hrs	Ret from RP	Remark
a	b	c	d	e	f	g	h	i	j	k	l
3 23 Feb	2443 Trans Co (Lt Trk) Hq & Hq Det 439th Bn (Trk)	144	21	CP97 – CP106	A	N280	CP97 CP99 CP103 CP104 CP105 CP106	1115 1215 1230 1253 1338 1423	1159 1259 1314 1337 1422 1507	N16	
4 23 Feb	2445 Trans Co (Lt Trk) 2446 Trans Co (Lt Trk)	144	21	CP97 – CP106	A	N4	CP97 CP99 CP103 CP104 CP105 CP106	1209 1309 1324 1347 1432 1630	1251 1351 1406 1429 1627 1721	N53	Halt at CP105, 1432 to 1545 until restrictions end
5 23 Feb	2447 Trans Co (Lt Trk) 2448 Trans Co (Lt Trk – attached)	124	21	CP97 – CP106	A	N16	CP97 CP99 CP103 CP104 CP105 CP106	1507 1607 1622 1645 1730 1953	1541 1641 1656 1719 1919 2011		Stop at CP105, disperse vhcls until restrictions end. Resume at 1845
	Legend: Co = company Det = detachment Hrs = hours Hq = headquarters Hvy = heavy Lt = light Ref = reference Rte = route Trk = truck Trans = transportation Vhcls = vehicles										

Table C-3. Road movement table-back

MAPS			
1	AVERAGE SPEED Serials 1-4, 24 kilometers per hour (kph) Serials 5-12, 24 kph; after 1845, 16 kph	5	CHECK POINTS (CP) A. Start Points – CP97 B. Release Point – CP106 C. Other Critical Points - CP99, CP103, CP104, CP105
2	AVERAGE DENSITY Serials 1-5, 12 vehicles per kilometers (km) Serials 6 – 12, 47 vehicles per km after 1845	6	Main Routes to Start Points – N28, N45, N280 N4, N16
3	HALTS Fourth serial at CP 105, 1432 to 1545 Fifth serial at CP 105, 1730 to 1845	7	Main Routes from Release Points – N16, N53
4	Routes – Route A		

ROAD MANAGEMENT PLANNING

C-59. Movement planners must manage the planned movement of convoys on controlled MSRs in order to issue movement credits, reroute, or divert.

MOVEMENT PLANNING

C-60. A critical time and point graph is a tool that may be used by movement planners to aid in preventing conflicts at critical points when planning and scheduling movements. It is an alternative method of managing movements from the grid system. Both methods accomplish the same function of tracking the planned itineraries of convoys as they arrive and clear planned check points along MSRs. This method is more

detailed and may be useful for planning movements on road networks that have many MSRs crossing each other.

CRITICAL TIME AND POINT GRAPH

C-61. Data for developing a critical time and point graph is taken from route synchronization plans or distribution network designs. These plans identify the critical points or check points that will be used to plan movements. Movement planners also receive movement information for preplanned or immediate requirements. Preplanned information is derived from movement graphs or tables used to support the movement program. Immediate requirements are generated on short notice from clearance requests (movement credit).

C-62. The movement planner posts the movement data for each movement requirement to the critical time and point graph for the day or days involved. The planner will either confirm the availability of the road network for the requesting unit or makes changes to separate, balance, or distribute based upon command priorities.

C-63. An example of a critical time and point graph is shown in figure C-24. Critical time and point graphs are composed of subgraphs, one for each critical point. The name or number of the critical point is marked along the left margin. Each critical point has four paths, one for each direction (north, south, east, and west). These paths are marked along the left side to show the predominant direction of movement or change of direction. Time is annotated along the top on the vertical divisions of the graph in short time blocks, normally 15 minutes or less. A graph may reflect any time period. However, graphs do not normally exceed 24 hours.

C-64. The critical time and point graph reflects a route with three critical points (25, 26, and 27). In this example, the vertical lines represent five-minute time blocks. See below for a detailed explanation showing how to graph two convoys arriving and departing at critical points—

- Convoy 225 traveling eastward on MSR Sparrow will arrive at critical point 25 at 0020 and will clear that point at 0040. Therefore, the block representing convoy 225 extends from the arrive time to the clear time.
- Convoy 225 then continues to travel eastward and will arrive at critical point 26 at 0130. At critical point 26, convoy 225 turns northward on MSR Hawk as shown by the flag extending from the eastbound to northbound paths. Changes in direction of travel at critical points are always indicated by a flag extending into the appropriate path on the graph opposite N, S, E, W. Convoy 225 clears critical point 26 about 0145.
- Convoy 226 travelling northward on MSR Hawk arrives at critical point 27 at 0230 and will clear that point at 0300.

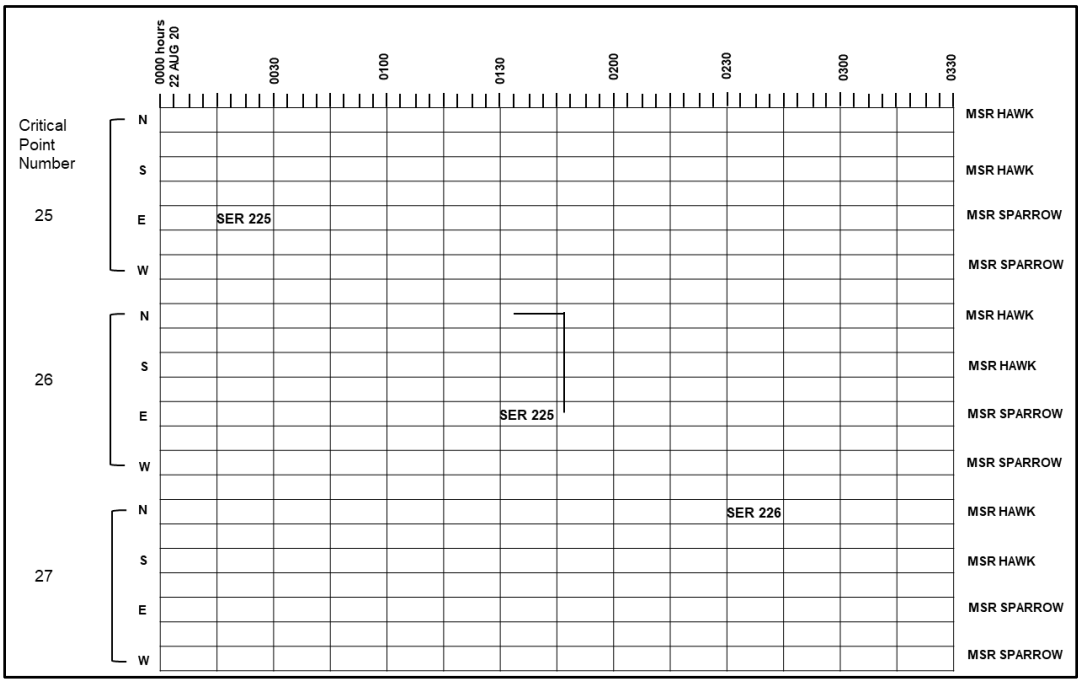

Figure C-24. Critical time and point graph

C-65. Critical time and point graphs should be prepared for each MSR in advance for a specified planning period to manage programmed moves over multiple routes. The data for arrive and clear times at critical points can be obtained from movement graphs or movement credits. The planning period will vary depending upon the level of command. Generally, the TSC, ESC and MCB work with longer planning periods than does the DTO because theater level movements can be programmed further in advance.

C-66. On the day of movement, movement planners receive the in-transit status of convoys as reported by MCTs or the moving unit. They check the progress of movement against the critical time and point graph for that day. When a convoy is reported off schedule, they check the graph for time and space separations from other convoys. If necessary, planners may reroute or stop a movement or reschedule convoys to prevent conflicts. They provide these changes to the affected commands and the military police.

This page intentionally left blank.

Appendix D

Example of a Route Synchronization Plan Format

This example route synchronization plan provides the basic format to develop a tailored plan in support of an OPLAN or exercise.

PURPOSE

D-1. The route synchronization plan is used to inform all units within the theater of operations of the policies and procedures governing convoy or oversize and overweight vehicle movements.

SCOPE

D-2. Route synchronization plans should be developed for all OPLANs or exercises and be included within the transportation annex of the applicable OPLAN or exercise directive. It is the responsibility of all organizations with a wartime route synchronization mission to develop route synchronization plans. Responsible organizations include DTOs, MCBs, and MCTs.

D-3. Whenever two or more regulating agencies operate in the same theater of operation, they must conduct coordination to standardize policies and procedures. Development of the distribution network design must also be coordinated to ensure mutual-use MSRs are given one name throughout the theater to avoid confusion. Movement priority codes and other policies and procedures must be standardized. Below is an example of a route synchronization plan. (See FM 6-0 for more details on plan formats.)

EXAMPLE FORMAT AND INFORMATION FOR THE ROUTE SYNCHRONIZATION PLAN

ANNEX ROUTE SYNCHRONIZATION PLAN TO OPERATION____
Reference: Maps, distribution network design, and other relevant documents.
Time zone used throughout the order

Time Zone Used Throughout the Plan: State the time zone used in the area of operations during execution. When the plan applies to units in different time zones, utilize Greenwich Mean (ZULU) Time.

Task Organization: Describe the organization of forces available to the issuing headquarters and their command and support relationships.

1. SITUATION.
   Include information affecting movement (terrain, weather, enemy forces, etc.).

2. MISSION.
   Include provisions of effective route synchronization, reporting, support of operations, and coordination of movement and maneuver. Identify responsible organizations (who controls routes).

3. EXECUTION.

a. Concept of movements. Briefly state the route synchronization concept and coordination of movements and maneuver and battlefield circulation control.
b. Tasks to subordinate units.
    (1) Units perform route reconnaissance or get information from a movement plan pertaining to theater route network.
    (2) Units responsible for abiding by all policies and procedures listed in the plan.
c. Coordination of use of MSRs.
    (1) Request procedures.
        (a) Use DD Form 1265 (*Request for Convoy Clearance*) and DD Form 1266 (*Request for Special Hauling Permit*). Put examples of these forms or the local equivalent in the appendix. Identify required data (mandatory). Hazardous cargo and oversize/overweight information must be put in remarks. Round trip, use DD Form 1265 with stopover time.
        (b) Submit to. Identify locations units will submit convoy movement requests or oversize/overweight. Telephone procedures/telephone numbers, FAX, walk in locations, MCT, system modem numbers, and so on. Hours of operations.
        (c) Submit when. How many days before movement peace/war, emergency procedures, and authorization.
        (d) Convoy movement priorities. Use numbers 1: highest priority and so on. Coordinate with all clearance activities to use same number system.
        (e) Minimum number of vehicles that constitute a convoy.
        (f) Infiltration rules (fewer vehicles than a convoy). Ensure infiltrating vehicles yield to convoys at intersection and do not hinder convoy movement.
        (g) Special movement consideration information must be entered in remarks on the movement request.
    (2) Route utilization information. Discuss MSR listed in a movement plan. Explain controlled versus MSR (open).
        (a) MSR listed on movement plan is open route, any unit can use. No clearance required. First come, first serve. Minimum speed on MSR and any restrictions. Direction of travel.
        (b) Controlled route. Listed in movement plan (same as dispatch route). Convoy request must be submitted and a clearance issued prior to movement. Minimum speed for controlled routes and any restrictions. Direction of travel.
        (c) Supervised route. Identify routes(s) rules and procedures.
        (d) Prohibited route. Identify which route in movement plan is prohibited.
        (e) Reserved route (identify who can use and duration).
        (f) Light lines.
        (g) Hardening of vehicles.

(3) Procedures.
(a) Distance between vehicles.
(b) Time gap between convoys.
(c) Oversize or overweight criteria. Procedures to submit for clearance.
(d) Vehicles per march unit.
(e) March units per serial.
(f) Blackout procedures.
(g) Hardening of vehicles.
(h) Convoy or hazardous cargo markings or flags.
(i) Delay in meeting SP procedures.

4. SUSTAINMENT.
a. Provide logistical support request procedures. Rest, refueling, and so forth. The movement plan (text version) identifies convoy halt locations, facilities, and services available to include units responsible for providing service.
b. Maintenance and recovery procedures. Vehicle breakdown procedures.
c. Medical evacuation procedures.
d. Halts.

5. COMMAND AND SIGNAL.
a. Command. Identify communications reporting locations and procedures with route synchronization and police officials.
b. Signal. Describe reporting requirements, method of communication, and radio frequencies.

This page intentionally left blank.

Appendix E

Example Route Status Table

This route status table (table E-1) is an example of a usable format and type of content.

Table E-1. Route status table

CRITERIA		***GREEN***	***AMBER***	***RED***	***BLACK***
Enemy	Security	- Security is established along routes	- Additional security is needed along routes and bypasses	- Security is not established along routes	- Security is not established along routes
	Threats	- Low occurrences of enemy activities - No scheduled local national activities or religious observances	- Two enemy attacks between the same phase lines, within the last twelve hours with damage of equipment and/or injuries - Scheduled local national activity or religious event	- Enemy attacks ≥ 3 between the same phase lines within the last 12 hours with damage of equipment and/or injuries - Scheduled local national activity or religious event declared as a threat	- Enemy concentration at or above level 2 attack; enemy contact imminent along route
Communi-cations	Status	- Communi-cations established	- Communications established but there are dead spots in certain routes	- No communications established	- No communications established
Bridges	Capacity	- Bridges military load classification (MLC) > 100 - No damages - No overhead restrictions	- Bridges with MLC 25 and < 99 - Damages with bypass available overhead > 4.3 < 5 meters	- Bridges with MLC > 4 and < 24 - Overhead < 4.3 meters - Damaged bridges awaiting Engineer damage assessment	- Non-passable; bridge completely destroyed unsafe by Division Engineers for military traffic - No bypass available

Table E-1. Route status table *(Continued)*

CRITERIA		*GREEN*	*AMBER*	*RED*	*BLACK*
Terrain	Roads	No construction: - Double flow roads Supports wheeled vehicles with width over 7.3 meters and tracked and combination with width over 8 meters - All weather roads (weather proof roads)	Construction: - Single lane roads (restricted to support vehicles, tracked and combination with width ≥ 3.5 ≤ 6 meters - Single flow roads (restricted to support vehicles, tracked and combination with width ≥ 6 ≤ 8m) - Limited all-weather routes affected by rain, frost, thaw, or heat - Road conditions delay convoy movements for < 2 hours	Construction: - Limited access roads (permits passage of isolated vehicles with width ≤ 3.5 meters and vehicles tracked combination with width ≤ 4 meters) - Fair weather route seriously affected by adverse weather conditions that will remain closed for long periods.	Construction: - Non-trafficable routes or bridges due to severe damage due to enemy interdiction, blockages, or floods. Roads will remain closed for an indefinite period.
		No Obstructions: - No overhead restrictions - Slopes < 7% - Curves with a radius > 45 meters; No blockages	Obstructions: - Curves with a radius of 25.1 to 45 meters - Slopes > 7% - Overhead restrictions ≥ 4.3 ≤ 5.0 meters over the route	Obstructions: - Curves with a radius > 25 meters - Road blockages	Obstructions that block the entire traveled way of road; no bypass available

Table E-1. Route status table *(Continued)*

CRITERIA		***GREEN***	***AMBER***	***RED***	***BLACK***
Weather	Impact on personnel or maneuver	- Favorable impact (wind chill or heat index/temperature – 6C (21F) to 29C (85F) - No/ light precipitation, ground dry or frozen to 12", <6" snow depth	Marginal impact: - Wind chill or heat index/temperature 30C to 35C or -7C to -26C, moderate precipitation, lightning within 5 mi, wind > 35 kts, hail > ½" diameter, puddles on improved surfaces, 1" – 2" rain per 12 hours or 0.1 – 0.4" rain per hour, 1-2" snow per 12 hours, 6-12" snow depth, visibility 160 – 800m	Unfavorable impact: -Wind chill or heat index/temperature > 35C (95F) or <-26C (-15F). Heavy precipitation, with > 49 kts, hail > ¾" diameter, sand storms that reduce visibility to < 25 meters	Unfavorable impact that causes a cease or military operations for more than two days. Visibility < 10 meters for sustainment convoys. No MEDEVAC coverage is available due to extreme weather. MEDEVAC will not fly during the following conditions – Day: < 500 ceiling and/or 1 mile visibility, Night: <700 ceiling and/or 2 mile visibility, thunderstorm warning or gusts > 45 knots
Multi-national operations		- No occurrences or scheduled friendly operations	- Scheduled or ongoing friendly operations without access restrictions	- Limited friendly operations with access restrictions	- Heavy enemy concentration; multinational forces engaged in ongoing offensive operations

Table E-1. Route status table *(Continued)*

CRITERIA		*GREEN*	*AMBER*	*RED*	*BLACK*
Unit/ friendly action		- Absolute verification or no threat	- Threats are possible even if no immediate perceivable threat is present	- An MSR/ASR is assessed as red when CCDR observes and reports an unconfirmed threat or interrogated, has limited use by multinational forces within last 7 days, or security assets are not available in the specific area. With exception of personnel supporting movement of route clearance and EOD. No sustainment personnel will travel on routes assessed as red, without coordination 96 hours out. The route will remain red until route clearance/ sanitization clears or EOD confirms/ mitigates the threat. Area owner brigade commander's approval can shut down an MSR/ASR for an hour in case of emergency; Usually the CCDR G-3 is approval authority if a part of a route will be red for more than 1 hr.	- A route is assessed as black when no traffic can travel on it due to washout, damage or a unit route clearance, or EOD observes and reports a confirmed threat. With the exception of personnel supporting movement of route clearance and EOD, no sustainment personnel will travel on routes assessed as black. The route will remain black until route clearance or EOD mitigates/ reduces the threat and reports this status to senior combatant commander G-3 for further analysis

Legend:

C = Celsius	CCDR = combatant commander	EOD = explosive ordnance disposal
F = Fahrenheit	G-3 = assistant chief of staff, operations	kts = knots
M = meter	MEDEVAC = medical evacuation	

Appendix F

Automation Information Systems

This appendix lists movement control and related automation information systems and describes the purpose for each system.

GLOBAL AIR TRANSPORTATION EXECUTION SYSTEM

F-1. Global Air Transportation Execution System (GATES) is a system used at aerial ports that integrates command and control, passenger operations, and cargo movement processes. It assists management of cargo manifested for air shipment, cargo awaiting air shipment, and cargo departed from aerial ports via air or ground transportation. GATES—

- Processes and tracks cargo and passenger information.
- Supports management of resources.
- Provides logistical support information.
- Supports scheduling and forecasting.
- Provides tracking and tracing of aerial port assets (including personnel, vehicles, equipment, and supplies).
- Supports processing service short-term cargo requirements and long term passenger and cargo requirements.
- Supports channel mission management.
- Manages tariff data regarding baggage, passenger, and pet fares.
- Manages passenger reservations.
- Provides reports and transportation status for customers.

F-2. GATES-OCEAN provides ship loading planning capabilities, concurrent planning for multi-ship operations.

F-3. The United States Air Force, AMC, developed GATES-AIR. GATES replaced the legacy systems that supported the AMC and SDDC transportation mission with a modernized, fully integrated, and significantly enhanced global transportation system using an open system infrastructure and shared, relational database that enable new requirements to be easily incorporated in the future.

F-4. GATES provides DOD and commercial partners with an automated functionality to process and track cargo and passenger information, support forecasting, provide logistical support information, and delivery service tracking for virtually all airlift and sealift data in the DTS. GATES interfaces with numerous of external systems including cargo and passenger movement status, cargo and passenger movement history, passenger reservations, movement and capability forecasting, cargo advance processing, billing and tariff information, and mission schedule information. GATES supports the function of cargo documentation and tracking at common user ocean terminals associated with SDDC as well as aerial ports. GATES provides required cargo documentation, accountability, and management reporting for both air and sea ports.

GLOBAL COMBAT SUPPORT SYSTEM-ARMY

F-5. Global Command Support System-Army supports commanders in garrison or during military operations by providing essential operational capabilities that include materiel management, maintenance management for ground, an interface to air, and property accountability operations including unit basic load, warehousing, limited distribution, materiel requirement planning, human resources, integrated financial capabilities, and procurement functionality. Global Command Support System-Army integrates enterprise information and provides both tactical and installation capabilities.

INTEGRATED BOOKING SYSTEM

F-6. Integrated booking system is the execution system for the DTS to move international cargo. Integrated booking system provides a worldwide, automated booking system to move military cargo outside the continental United States. The integrated booking system allows DOD shippers to automatically process movement requests directly using SDDC's booking offices. The integrated booking system automatically determines the best value ocean carrier supporting the move. An integrated booking system supports deployment, employment, and sustainment. Integrated booking system interfaces with the ocean carrier industry, GATES, and Integrated Development Environment/Global Transportation Network Convergence (IGC).

INTEGRATED COMPUTERIZED DEPLOYMENT SYSTEM

F-7. Integrated Computerized Deployment System software provides for a single, multi-modal, cross-service load planning and execution platform. The system integrates load planning functions through a graphically interactive interface within a computer-based environment providing intelligent agent-based decision support. The software architecture is required to support cross-service operations and multiple transportation modes (for example, ships, aircrafts, railcars, containers and conveyance estimation) moving through marshalling yards and related staging areas at installations, ocean terminals and air ports of embarkation or debarkation in a single software platform.

INTEGRATED DEVELOPMENT ENVIRONMENT/GLOBAL TRANSPORTATION NETWORK CONVERGENCE

F-8. Integrated Development Environment/Global Transportation Network Convergence is the system of record of ITV and asset visibility. IGC provides the DOD with a cohesive set of networked, end-to-end visibility, deployment, and distribution capabilities. IGC-integrated automated data processing and information systems, electronic commerce, and electronic data interchange to track the identify, status, and location of DOD unit and non-unit cargo, passengers, patients, forces, military and commercial air mobility, and sealift and surface assets from origin to destination across the range of military operations.

JOINT CONTAINER MANAGEMENT SYSTEM

F-9. Joint container management system provides the ability to effectively manage and track government-owned and leased assets. Army container inventory data will be captured in the joint container management system and all updates or adjustments to the inventory and related data element will be processed in the automation system. For more information see ATP 4-12.

JOINT PLANNING AND EXECUTION SERVICES SYSTEM

F-10. The joint planning and execution services system is an integrated joint command and control system used to support the DOD with monitoring planning and execution activities. The joint planning and execution services system furnishes joint commanders and war planners, at all levels, standardized policy procedures and formats to execute a variety of required tasks. The joint planning and execution services system assists planners in development of operation plans, concept plans, functional plans, campaign plans, and operation orders. The joint planning and execution services system is used for time-phased force deployment data management and development. It defines requirements and gains visibility of the movement of combat forces into the combat commanders' area of responsibility. The joint planning and execution services system combines individual service terminology into one standard system. It standardizes the joint planning system used to execute complex multi-service exercises, campaigns, and operations. The joint planning and execution services system automated data processing resides in the computer network of the Global Command and Control System.

PORTABLE DEPLOYMENT KIT

F-11. A portable deployment kit provides a complete active radio frequency identification solution for real-time, end-to-end visibility of goods and critical assets moving through the defense transportation system. A

portable deployment kit currently includes a laptop, handheld computer, mobile reader, printer, software, and communications equipment needed for asset tracking. The kit allows MCTs to quickly set up mobile operations, automating the collection, aggregation, and de-aggregation of cargo. A portable deployment kit also enables active radio frequency identification tag read and write capabilities, and prints military shipping labels with updated shipment information.

RADIO FREQUENCY IN-TRANSIT VISIBILITY SYSTEM

F-12. The radio frequency in-transit visibility system infrastructure is a network, located at select locations worldwide, of radio frequency identification read and write stations and associated computers, servers, software, and communications capabilities used for tracking shipments and assets of a radio frequency identification tags and satellite-based tagged shipments in the U.S. military supply chain. The radio frequency identification sites are typically found at supply and transportation nodes (such as depots, terminals, ports, supply support activities, and base supply agencies, and even some manufacturing facilities). Mobile radio frequency identification stations, also known as portable deployment kits, pallet tag interrogation support kits, and early entry deployment support kits, provide a radio frequency identification visibility capabilities at remote locations or at locations where the capability is temporarily needed.

SINGLE MOBILITY SYSTEM

F-13. The single mobility system is a web-based computer system that provides visibility of air, sea, and land transportation assets and provides aggregated reporting of cargo and passenger movements from the strategic to tactical level. The single mobility system does this by collecting plane, ship, and truck movement data from other computer systems such as IGC, GATES, and numerous other systems. The system monitors changes to user-selected requirements and missions. The application specializes in force flow, sustainment, contingency or exercise planning, predictive analysis and executive, strategic, operational, and tactical responsiveness. The single mobility system provides real-time command and control visualization, in-transit visibility, force deployment, and redeployment, planning, and execution.

TRANSPORTATION COORDINATORS AUTOMATED INFORMATION FOR MOVEMENTS SYSTEM II

F-14. Transportation Coordinators Automated Information for Movements System II (TC-AIMS II) supports all unit deployment, redeployment, retrograde, and sustainment operations. TC-AIMS II automates and manages the movement of personnel, equipment, and sustainment cargo—maintaining visibility at the tactical, operational, and strategic levels. These capabilities automate the planning, coordination, execution, and tracking of unit movement data and sustainment. TC-AIMS II provides an automated information tool capable of managing unit movement data for deployment and allocating transportation assets in a theater of operations. TC-AIMS II produces linear bar codes, two-dimensional bar codes, and military shipping labels. It also enables the ability to create radio frequency tags.

This page intentionally left blank.

Glossary

This glossary lists acronyms and terms with Army or joint definitions. Where Army and joint definitions differ, (Army) precedes the definition. Terms for which ATP 4-16 is the proponent are marked with an asterisk (*) before the term. For other terms, it lists the proponent publication in parentheses after the definition.

SECTION I – ACRONYMS AND ABBREVIATIONS

ADP	Army doctrine publication
AMC	Air Mobility Command
AOR	area of responsibility
ASCC	Army Service component commander
ASR	alternate supply routes
ATP	Army techniques publication
BCT	brigade combat team
BSB	brigade support battalion
CBRN	chemical, biological, radiological, and nuclear
CCDR	combatant commander
CHE	container handling equipment
CP	check point
CTO	corps transportation officer
DMC	distribution management center
DOD	Department of Defense
DODAAC	Department of Defense Activity Address Code
DSB	division sustainment brigade
DTO	division transportation officer
DTS	Defense Transportation System
ESC	expeditionary sustainment command
G-3	assistant chief of staff, operations
G-4	assistant chief of staff, logistics
G-5	assistant chief of staff, plans
G-9	assistant chief of staff, civil affairs operations
GATES	Global Air Transportation Execution System
HN	host nation
ICTC	inland cargo transfer company
IGC	Integrated Development Environment/Global Transportation Network Convergence
ITV	in-transit visibility
J-3	operations directorate of a joint staff
JDDOC	joint deployment and distribution operations center

km	kilometer
LOC	line of communications
MCB	movement control battalion
MCE	movement control element
MCT	movement control team
MEB	maneuver enhancement brigade
MHE	materials handling equipment
MSR	main supply route
No.	number
OCS	operational contract support
OPLAN	operation plan
OPORD	operation order
PIC	positive inbound clearance
POC	point of contact
POD	port of debarkation
RDD	required delivery date
RP	release point
RSOI	reception, staging, onward –movement and integration
S-3	battalion or brigade operations staff officer
S-4	battalion or brigade logistics staff officer
SDDC	Military Surface Deployment and Distribution Command
SP	start point
SPM	single port manager
SPO	support operations
TC-AIMS II	Transportation Coordinator's Automated Information for Movements System II
TCN	transportation control number
TMCE	theater movement control element
TMR	transportation movement release
TSC	theater sustainment command
USTRANSCOM	United States Transportation Command

SECTION II – TERMS

alternate supply route

(Army) A route or routes designated within an area of operations to provide for the movement of traffic when main supply routes become disabled or congested. Also called ASR. (FM 4-01)

boundary

A line that delineates surface areas for the purpose of facilitating coordination and deconfliction of operations between adjacent units, formations, or areas. (JP 3-0)

***centralized control**

(Army) A focal point for transportation planning and resource allocation at the appropriate integrated logistics support level to manage current and future requirements of the supported force.

***committal authority**

The ability to obligate Army common user transportation resources against a transportation movement requirement.

contingency

A situation requiring military operations in response to natural disasters, terrorists, subversives, or as otherwise directed by appropriate authority to protect United States interests. (JP 5-0)

line of communications

A route, either land, water, and/or air, that connects an operating military force with a base of operations and along which supplies and military forces move. Also called LOC. (JP 2-01.3)

main supply route

The route or routes designated within an operational area upon which the bulk of traffic flows in support of military operations. Also call MSR. (JP 4-01.5)

marshalling area

A location in the vicinity of a reception terminal or pre-positioned equipment storage site where arriving unit personnel, equipment, materiel, and accompanying supplies are reassembled, returned to the control of the unit commander, and prepared for onward movement. (JP 3-35)

movement control

(Army) The dual process of committing allocated transportation assets and regulating movement according to command priorities to synchronize the distribution flow over lines of communications to sustain land forces. (ADP 4-0)

***movement credit**

The allocation granted to one or more vehicles in order to move over a controlled route in a fixed time according to movement instructions.

movement requirement

A stated movement mode and time-phased need for the transport of units, personnel, and/or materiel from a specified origin to a specified destination. (JP 4-09)

movement table

A table giving detailed instructions or data for a move. (JP 4-09)

operational control

The authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Also called OPCON. (JP 1)

organic

Assigned to and forming an essential part of a military organization as listed in its table of organization for the Army, Air Force, and Marine Corps, and are assigned to the administrative organizations of the operating forces for the Navy. (JP 1)

port of debarkation

The geographic point at which cargo or personnel are discharged. Also called POD. (JP 4-0)

port of embarkation

The geographic point in a routing scheme from which cargo or personnel depart.. Also called POE. (JP 3-36)

***positive inbound clearance**

The process of the origin movement control team contacting the destination movement control team before a transportation movement release is created to ensure the destination unit has the capability to receive the shipment, considering materials handling equipment, storage and personnel available. Also called PIC.

pre-position

To place military units, equipment, or supplies at or near the point of planned use, or at a designated location, to reduce reaction time and to ensure timely support of a specific force during initial phases of an operation. (JP 4-0)

reception

1. All ground arrangements connected with the delivery and disposition of air or sea drops. 2. Arrangements to welcome and provide secure quarters or transportation for defectors, escapees, evaders, or incoming agents. 3. The process of receiving, offloading, marshalling, and transporting of personnel, equipment, and materiel from the strategic and/or intratheater deployment phase to a sea, air, or surface transportation point of debarkation to the marshalling area. (JP 3-35)

***required delivery date**

Identifies when personnel and/or cargo must arrive at its destination in order to properly support an operation or contingency. Also called RDD.

staging

Assembling, holding, and organizing arriving personnel, equipment, and sustaining materiel in preparation for onward movement. (JP 3-35)

staging area

1. Airborne - A general locality between the mounting area and the objective of an airborne expedition through which the expedition, or parts thereof, pass after mounting, for refueling; regrouping; and/or exercise, inspection, and redistribution of troops. (JP 3-35) 2. Other movements - A general locality established for the concentration of troop units and transient personnel between movements over the lines of communications. (JP 3-35) 3. In amphibious operations, one or more intervening ports for refueling, logistic support, emergency repairs, or final rehearsals. (JP 3-02)

***standing transportation movement release**

A document that assigns a transportation capability to a movement requirement that has the same origin, destination, load time, spot time, pull time and is a perpetual requirement.

theater

The geographical area for which a commander of a geographic combatant command has been assigned responsibility. (JP 1)

theater of operations

An operational area defined by the geographic combatant commander for the conduct or support of specific military operations. Also called TO. See also theater of war. (JP 3-0)

theater opening

The ability to establish and operate ports of debarkation (air, sea, and rail), establish a distribution system and sustainment bases, and to facilitate port throughput for the reception, staging, onward movement and integration of forces within a theater of operations. (ADP 4-0)

time-phased force deployment data

The time-phased force, non-unit cargo, and personnel data combined with movement data for the operation plan, operation order, or ongoing rotation of forces. Also called TPFDD. (JP 5-0)

transportation component command

A major command of its parent Service under United States Transportation command, which includes Air Force Air Mobility Command, Navy Military Sealift Command, and Army Military Surface Deployment and Distribution Command. Also called TCC. (JP 4-01.6)

***transportation movement release**

A document that assigns a transportation capability to a movement requirement and provides the movement details. Also called TMR.

References

All websites accessed 17 January 2022.

REQUIRED PUBLICATIONS

These documents must be available to intended users of this publication.

DOD Dictionary of Military and Associated Terms. March 2022.

FM 1-02.1. *Operational Terms.* 9 March 2021.

FM 1-02.2. *Military Symbols.* 10 November 2020.

RELATED PUBLICATIONS

These documents contain relevant supplemental information.

DEPARTMENT OF DEFENSE AND JOINT PUBLICATIONS

Unless otherwise indicated, most Department of Defense issuances can be found at: https://www.esd.whs.mil/dd/.

Most joint publications are available online at: http://www.jcs.mil/Doctrine.

DODI 5200.01. *DOD Information Security Program and Protection of Sensitive Compartmented Information (SCI)*. 21 April 2016.

JP 1. *Doctrine for the Armed Forces of the United States*. 25 March 2013.

JP 2-01.3. *Joint Intelligence Preparation of the Operational Environment*. 21 May 2014.

JP 3-0. *Joint Operations.* 17 January 2017.

JP 3-02. *Amphibious Operations*. 4 January 2019.

JP 3-35. *Deployment and Redeployment Operations*. 10 January 2018.

JP 3-36. *Joint Air Mobility and Sealift Operations*. 4 January 2021.

JP 4-0. *Joint Logistics*. 4 February 2019.

JP 4-01. *The Defense Transportation System*. 18 July 2017.

JP 4-01.5. *Joint Terminal Operations*. 2 November 2015.

JP 4-01.6. *Joint Logistics Over-the-Shore*. 3 February 2017.

JP 4-09. *Distribution Operations (U//FOUO).* 14 March 2019.

JP 4-10. *Operational Contract Support*. 4 March 2019.

JP 5-0. *Joint Planning*. 1 December 2020.

ARMY PUBLICATIONS

Unless otherwise indicated, Army publications are available at: https://armypubs.army.mil/.

ADP 3-0. *Operations*. 31 July 2019.

ADP 4-0. *Sustainment*. 31 July 2019.

AR 700-80. *Army In-Transit Visibility*. 30 September 2015.

AR 715-9. *Operational Contract Support Planning and Management*. 24 March 2017.

ATP 3-11.37/MCRP 10-10E.7/NTTP 3-11.29/AFTTP 3-22.44. *Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Reconnaissance and Surveillance*. 31 March 2021.

ATP 3-34.81/MCWP 3-17.4. *Engineer Reconnaissance*. 1 March 2016.

ATP 3-35. *Army Deployment and Redeployment*. 23 March 2015.

ATP 3-93. *Theater Army Operations*. 27 August 2021.

ATP 4-0.1. *Army Theater Distribution*. 29 October 2014.

ATP 4-10/MCRP 4-11H/NTTP 4-09.1/AFMAN 10-409-O. *Multi-Service Tactics, Techniques, and Procedures for Operational Contract Support*. 16 December 2021.

ATP 4-11. *Army Motor Transport Operations*. 14 August 2020.

ATP 4-12. *Army Container Operations*. 12 February 2021.

ATP 4-13. *Army Expeditionary Intermodal Operations*. 16 April 2014.

ATP 4-93. *Sustainment Brigade*. 11 April 2016.

ATP 4-94. *Theater Sustainment Command*. 28 June 2013.

FM 3-57. *Civil Affairs Operations*. 28 July 2021.

FM 3-81. *Maneuver Enhancement Brigade*. 9 November 2021.

FM 3-94. *Armies, Corps, and Division Operations*. 23 July 2021.

FM 4-0. *Sustainment Operations*. 31 July 2019.

FM 4-01. *Army Transportation Operations*. 3 April 2014.

FM 6-0. *Commander and Staff Organization and Operations*. 5 May 2014.

FM 6-27/MCTP 11-10C. *The Commander's Handbook on the Law of Land Warfare*. 7 August 2019.

UNITED STATES LAW

United States Codes are available at: https://uscode.house.gov/.

Title 10. United States Code. *Armed Forces*.

WEBSITES

Automated Movement and Identification Solutions website available at: https://usarmyamis.army.mil/TC-AIMSII.html.

Combined Arms Support Command Fielded Force Integration Directorate–Planning Data Branch website available at: https://cascom.army.mil/g_staff/cdi/fdd/mld/planning_data_branch.htm.

PRESCRIBED FORMS

This section contains no entries.

REFERENCED FORMS

Unless otherwise indicated, DA Forms are available on the Army Publishing Directorate (APD) web site: https://armypubs.army.mil/. DD forms are available on the Executive Services Directorate website at https://www.esd.whs.mil/Directives/forms/.

DA Form 2028. *Recommended Changes to Publications and Blank Forms.*

DD Form 1265. *Request for Convoy Clearance.*

DD Form 1266. *Request for Special Hauling Permit.*

Index

Entries are by paragraph number.

This page intentionally left blank.

ATP 4-16
25 April 2022

By Order of the Secretary of the Army:

JAMES C. MCCONVILLE
General, United States Army
Chief of Staff

Official:

MARK F. AVERILL
Administrative Assistant
to the Secretary of the Army
2210901

DISTRIBUTION:
Active Army, Army National Guard, and United States Army Reserve. Distributed in electronic media only(EMO).

This page intentionally left blank.