

Movement Control



MAGTF Staff Training Program (MSTP)

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FOREWORD

1. **PURPOSE.** MSTP designed Pamphlet 4-0.2, *Movement Control* to assist commanders and staff officers when planning and executing movement control.

2. **SCOPE.** This pamphlet expands on MCTP 3-40F, *Transportation Operations*, specifically on techniques for planning and executing movement control. While the pamphlet primarily focuses on movement control within a Marine Air Ground Task Force, terminology and techniques align with joint and U.S. Army doctrine and should assist Marine commanders and staffs operating in a joint environment or as part of a Joint Task Force when using joint and Army terms and techniques.

3. **SUPERSESSION.** MSTP Pamphlet 4-0.2 dated June 2013.

4. **CHANGES.** MSTP encourages recommendations for improvements to this pamphlet from organizations as well as from individuals. You can reproduce the attached User Suggestion Form and forwarded to:

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5. **CERTIFICATION.** Reviewed and approved this date.



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Part I: Movement Control Agencies

The success of military operations often depends on sound and timely deployment and logistical support. An efficient and effective transportation system for the movement of troops, equipment, and supplies remains essential to rapid deployment and the support of forces. Transportation systems consist of the air, land, and sea lines of communications; terminal operations at support bases, ports, and airfields; and movement control. Movement control encompasses the most critical part of a transportation system as inadequate control of logistic movement results in waste, reduced efficiency, and loss of combat power, all of which can increase risk to the force. *Movement control is the planning, routing, scheduling, and control of personnel and cargo movements over lines of communications...* (LOCs) (Joint Publication [JP] 4-01.5). Movement control also consists of validating and prioritizing movement requirements, allocating resources, coordinating and de-conflicting movements, and includes maintaining in-transit visibility (ITV) of forces and material during movement and through the deployment and/or redeployment process. Movement control balances requirements against capabilities and assigns resources based on the commander's priorities.

MCO 4470.1B, *Marine Air Ground Task Force (MAGTF) Deployment and Distribution Policy (MDDP)* outlines the establishment of a Movement Control Agency (MCA). The purpose seeks to standardize the distribution process. However, commanders may task organize their MCAs based on the situation. This pamphlet focuses on assisting Marines who may find themselves as a Marine Expeditionary Force (MEF)/Marine Expeditionary Brigade-level staff planner or assigned to an MCA.

1001. Joint Movement Control

Joint movement control spans the strategic, operational, and tactical levels of war to ensure a fully coordinated distribution pipeline operates effectively and efficiently. Movement control coordinates and synchronizes transportation resources to enhance combat effectiveness and meet the priorities of the Geographic Combatant Command (GCC)/Joint Task Force (JTF) Commander. The Joint Deployment and Distribution Enterprise (JDDE) includes equipment, procedures, doctrine, leaders, technical connectivity, information, organizations, facilities, training, and materiel necessary to conduct joint deployment and distribution operations (JP 4-0).

1002. Inter-theater Movement Control

The U.S. Transportation Command (USTRANSCOM), as the Department of Defense (DOD) Distribution Process Owner, is responsible to combatant commanders for creating and implementing global distribution solutions in support of the National Security Strategy. USTRANSCOM provides common-user and commercial air, land, and sea transportation; port opening; as well as port management at aerial/sea ports of debarkation (APODs/SPODs) for the DOD.

a. Deployment and Distribution Operations Center

The USTRANSCOM's Deployment and Distribution Operations Center (DDOC) provides the single coordination and synchronization element that manages distribution operations within the JDDE. The representatives of transportation component commands of USTRANSCOM collocate with other joint planners to address requirements with a multi-modal view in order to ensure a common understanding of supported GCC and Service requirements and limitations.

b. Transportation Component Commands

- **Air Mobility Command (AMC).** The AMC provides air mobility for deployment, sustainment, redeployment, and special common-user missions such as aeromedical evacuation (AE). Contracted commercial air carriers may augment military airlift and AE. Additionally, AMC provides the single port manager and, where designated, operator of the common-user aerial ports of embarkation (APOEs) and APODs.
- **Military Surface Deployment and Distribution Command (SDDC).** The SDDC serves as the continental United States transportation manager and provides worldwide common-use ocean terminal services and traffic management services to deploy, employ, sustain, and redeploy forces globally. The SDDC manages and employs the DOD common-user intermodal container fleet across the range of military options. Also, SDDC develops transportation contracts and container-leasing agreements that support the transportation management of freight such as tanks, fuel, ammunition, combat vehicles, food, and other commodities to locations within the continental United States and throughout the world. The SDDC Operations Center synchronizes deployment and sustainment surface transportation and provides port management for DOD.
- **Military Sealift Command.** The Military Sealift Command (MSC) holds responsibility for designated common-user sealift transportation services to deploy, employ, sustain, and redeploy United States forces on a global basis. However, MSC does not usually become involved in movement control.

c. Defense Logistics Agency

The Defense Logistics Agency (DLA) provides centralized materiel management and asset visibility to the distribution pipeline. The DLA supports each GCC with a DLA support team that coordinates DLA activities throughout their assigned theater.

1003. Intra-theater Movement Control

The supported GCC controls intra-theater movement. Theater movement control plans must provide the GCC with the highest practicable degree of influence and control over movement into, within, and out of the theater. Regardless of the option selected, the theater movement control system must allow the GCC the capability to plan, apportion, allocate, coordinate, de-conflict movement requirements, and track the forces and materiel in the theater. Moreover, the theater movement control plan must facilitate the incorporation of incoming strategic movements with the theater distribution plan and theater joint reception, staging, onward movement, and integration (JRSO&I) operations.

The GCC employs a wide range of movement control options to enable effective interface between inter-theater and intra-theater movements. The GCC may direct Subordinate JTFs or service components to carry out their own movement control. However, to facilitate a fully coordinated and responsive transportation control system, the GCCs develop their own internal DDOC.

a. Joint Deployment and Distribution Operations Center

The Joint Deployment and Distribution Operations Center (JDDOC) constitutes the cornerstone capability for linking each theater with the JDDE to support the GCC's end-to-end movements. The JDDOC provides the GCC access and visibility to the joint distribution pipeline to help achieve time definite delivery. It also serves as a link among multiple organizations including coalition partners, combat support (CS) agencies, nongovernmental organization liaison elements, commercial transportation providers, and other private entities. Also, the JDDOC includes assigned organic national partner representatives. Their expertise and capability to reach back to USTRANSCOM's national operations and command centers creates synchronization between the inter-theater and intra-theater legs of the distribution system. The premise behind the JDDOC capability fuses theater expertise with national-level, strategic knowledge and reach-back authority within the GCC's command structure. The JDDOC accomplishes theater joint movement

responsibilities for any potential logistic organizational structure as directed by the GCC. Normally, the JDDOC operates under the direction of the GCC's J-4 directorate.

The JDDOC synchronizes the strategic to operational movement of forces and sustainment into theater by providing advance notice to the GCC's air and surface theater movement command and control (C2) elements. The JDDOC collects data and provides the GCC with metrics on lift capacity throughout both the inter-theater and intra-theater systems. It also coordinates and synchronizes all GCC common-user transportation activities and integrates commercial lift capability as far forward as determined by the GCC.

In concert with GCC priorities and on behalf of the GCC, the JDDOC coordinates common-user and theater distribution operations above the tactical level. It develops deployment and distribution plans; integrates multinational and/or interagency deployment 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 provides reach-back to organizations critical to the GCC's operational mission.

b. Theater-Joint Transportation Board

Combatant commanders and subordinate commanders need the capability to rapidly adjust transportation resource allocation to changing circumstances or react to emergency or unanticipated situations. The GCC's Theater-Joint Transportation Board resolves contentious transportation issues within the command such as allocating transportation capability among components for unit movement, non-unit movement, resupply, and disposal. The director of the JDDOC normally chairs the Theater-Joint Transportation Board.

c. Joint Movement Center

A Joint Force Commander (JFC) may establish a Joint Movement Center (JMC) at a subordinate unified or JTF level to coordinate the employment of all means of transportation (including allies or host nation [HN]) to support an operation. Established Theater and JTF transportation policies accomplish this coordination within the assigned operational area consistent with relative urgency of need, port and terminal capabilities, transportation asset availability, and priorities set by the JFC. The JTF JMC works closely with the JDDOC.

The JFC's movement control plan is the critical element in an effective movement control system. The plan should coordinate the transportation capabilities of the component commands to produce a movement control system with centralized control and decentralized execution.

1004. MAGTF Movement Control Agencies and Key Personnel

MCTP 3-40F *Transportation Operations* outlines Movement Control as the C2 element of transportation planning and execution. Movement Control is essentially a C2 function. MCAs organize within the command elements (CE) at each echelon of a MAGTF to facilitate C2 of personnel and equipment movements over LOCs. At the MAGTF level, transportation management and movement control reside in the MAGTF Deployment and Distribution Operation Center (MDDOC) headed by the MAGTF Distribution Officer (MDO). A MAGTF Movement Control Center (MMCC) organizes as a standing element of the MDDOC to allocate, schedule, and coordinate ground transportation requirements based on the MAGTF Commander's priorities. Other MCAs, such as the Unit Movement Control Centers (UMCCs) at the Major Subordinate Command (MSC) level or below, may be temporary and consist of no more than a few individuals in the unit's S-4 section.

1005. MAGTF Deployment and Distribution Operations Center

The MAGTF Deployment and Distribution Operations Center (MDDOC), located within the MAGTF CE, conducts integrated planning; provides guidance, direction, and coordination; and monitors transportation

and inventory resources in its role as the manager of the MAGTF's distribution process. MDDOC must conduct its normal functions to facilitate force generation, embarkation/deployment, sustainment, and retrograde/redeployment. The MDDOC may operate under the cognizance of either the G-3/S-3 or G-4/S-4. Either arrangement requires integration of the MDDOC's activities with the counterpart staff section, but at no time will the components of the MDDOC split between two sections. The size and scope of the MDDOC scales to meet mission requirements for the MAGTF it supports. The MDDOC:

- Coordinates and supervises the MAGTF deployment and distribution process.
- Coordinates strategic and operational-level deployment and distribution support with higher and adjacent agencies in support of the MAGTF.
- Deconflicts competing deployment and distribution requirements based on the MAGTF commander's priorities.
- Coordinates and maintains asset visibility requirements and implementation throughout the distribution pipeline.
- Manages and maintains visibility of MAGTF deployment and distribution resources to include International Organization for Standardization (ISO) containers and 463L pallet systems.
- Develops and publishes the Surface Tasking Order/Ground Transportation Order (GTO) in order to direct and coordinate organic, commercial, and HN surface movements.
- Participates in the development of the Air Tasking Order in order to coordinate the use of aviation assets.
- Establishes highway priorities and movement control procedures.
- Coordinate and supervise deployment and distribution process training.
- Monitors and oversees updates to the cargo routing matrix and manage Cargo Routing Information File updates.
- Serves as the MAGTF-level air clearance authority validator.
- Supports the MAGTF Reception, Staging, and Onward Movement reception, staging, onward movement & integration Coordinator.
- Establishes and conducts working groups (WGs) or boards to execute movement control such as Movement Control WGs or Transportation Boards.
- As required, coordinates movement plans with the MAGTF Materiel Readiness Officer in order to increase materiel availability.
- Requests and monitors the use of inter-theater and intra-theater air, ground, and sealift.
- Coordinates with the supporting establishment, adjacent, and higher headquarters (HHQ) for MAGTF distribution support.
- Manages all deployment and distribution related Automatic Identification Technology (AIT)/automated information system (AIS) within the MAGTF.
- Serves as ITV coordinator for the MAGTF.
- Monitors and provides input to Type of Address Code-2 changes.

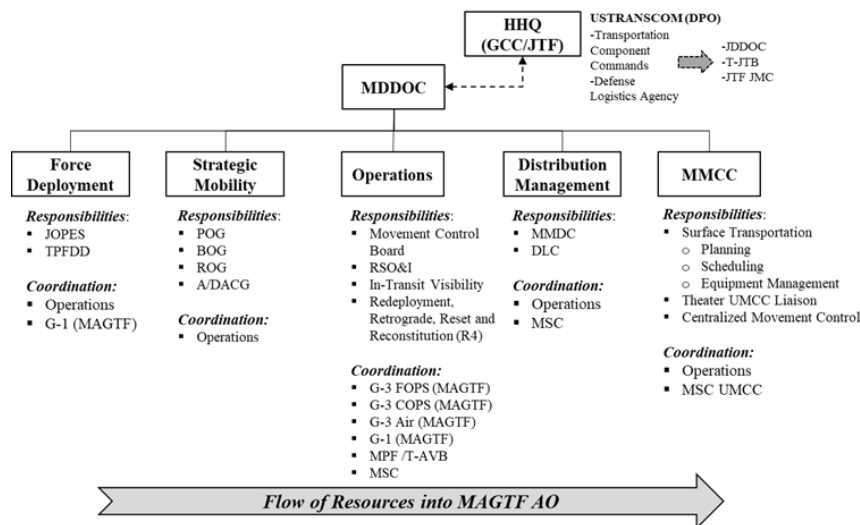


Figure 1-1. MAGTF Deployment and Distribution Operations Center (MDDOC) Structure Template

1006. MAGTF Movement Control Center

The MMCC, a standing element of the MDDOC, allocates, schedules, and coordinates surface transportation requirements based on the MAGTF Commander's priorities. The size and scope of the MMCC scales to meet mission requirements for the MAGTF it supports MEF, Marine Expeditionary Brigade, Marine Expeditionary Unit, and Special Purpose MAGTF. The MMCC supports the planning and execution of MAGTF movements and reports directly to the MDDOC. The MMCC coordinates MAGTF ground movement scheduling, equipment augmentation, transportation requirements, material handling equipment (MHE), and other movement support. In addition, it coordinates activities with UMCCs. The MMCC:

- Provides transportation planning and regulation; coordinates all ground movement scheduling, equipment augmentation, and other movement support to and from points of origin to ports of embarkation and from ports of debarkation to final destination.
- Coordinates activities with UMCCs to support unit movement requirements; collect, process, and analyze transportation information and provide analysis to higher and adjacent units.
- Performs route synchronization and provides centralized movement control for moving personnel and materiel across the MAGTF area of operations (AO).
- Establishes liaison with theater movement control centers (MCCs) and internal MCCs to ensure timely and accurate updates, coordination, and tracking.
- Receives and processes convoy movement and oversized vehicle permit requests. Issues convoy clearance for approved movements, monitors and tracks MAGTF ground movement and provides instruction for diversion or rerouting based upon the condition of Main Supply Routes (MSRs), ship-to-shore lanes, enemy activity, or congestion.
- Coordinates with the MAGTF G-2/S-2, G-3/S-3, MAGTF Engineer, and Military Police for route classification and selection. Provides transportation route overlays and traffic circulation plans and collects, processes, and distributes information on MSR status.
- Assists with coordination of the operation of attached or assigned Terminal Operations Organizations (TOOs) such as beach operations groups, port operations groups, Railhead Operations Groups, Movement Control Teams (MCTs), arrival/departure airfield control groups (A/DACG), and Helicopter Support Teams (HST).
- Schedules marshaling, movement, departure/arrival of personnel, supplies, and equipment per the MAGTF Commander's movement flow.
- Provides status updates to HHQ.

- Coordinates distribution requirements with the MAGTF Materiel Distribution Center (MMDC) and other agencies.
- Functions afloat include coordination of passengers, mail, cargo, and ship-to-ship and ship-to-shore movements.
- Maintains visibility of deployment and redeployment of units and cargo.

1007. MAGTF Materiel Distribution Center

The MMDC is the MAGTF's distribution element. The mission of the MMDC is to provide general shipping and receiving services, consolidated distribution services, and to maintain asset visibility to enhance throughput velocity and sustain operational tempo. The MMDC resides with the Logistics Combat Element (LCE) and will establish and operate the distribution network. The MMDC conducts the following:

- Establish and manage freight operations.
- Participate in Operational Planning Teams (OPT) and develop sustainment cargo throughput plans at the MSC/MSE levels.
- Synchronize tactical and operational sustainment distribution.
- Maintain asset visibility for sustainment cargo.
- Establish, coordinate, and control the Distribution Liaison Cells.
- Coordinate the receiving, shipping, and delivery of materiel to and from supported units.
- Coordinate the shipment and retrograde of personal effects and baggage of medically evacuated, emergency leave, or other special category personnel.
- Coordinate material transshipment to supported units.
- Manage preservation, packaging, packing, and marking operations.
- Certify hazardous materials for shipment.
- Manage the strategic pool of MEF 20' ISO containers in support of contingency and exercise shipping conveyance requirements.

1008. Unit Movement Control Center

UMCCs are standing organizations within MSCs or Major Subordinate Elements (MSEs) and, as required, provide UMCC capabilities for their respective subordinate commands. The UMCC's responsibilities include:

- Coordinate the movement of unit forces including cross-boundary and movement clearance requests for movements transiting the unit's AO.
- Direct unit marshaling.
- Coordinate the use of movement assets.
- Identify additional support requirements beyond organizational capabilities.
- Deconflict competing movement requirements within the organization.
- Enforce highway regulations and movement control standards as designated by higher authority.
- Ensure satisfaction of applicable unit move/deployment related ITV requirements.
- Report updates to higher MCCs. Designate a representative to attend the MAGTF Movement Control Board/WG or Transportation Board/WG to discuss pending requests and gain awareness of movement or transportation issues.
- Provide resources within the unit combat operations center (COC) to provide common tactical picture (CTP) visibility of ground movements to the G-3/S-3.

1009. Distribution Liaison Cells

Distribution Liaison Cells comprise the LCE's primary distribution elements to support the force. The Distribution Liaison Cells are task organized and structured to perform various distribution related tasks at ports of embarkation/debarkation, forward operating areas, or within the MAGTF. Roles and responsibilities of the Distribution Liaison Cell are to:

- Establish and manage freight operations.
- Synchronize operational, tactical, and sustainment distribution.
- Maintain asset visibility for sustainment cargo.
- Coordinate the receiving, shipping, and delivery of materiel to and from supported units.
- Coordinate the shipment and retrograde of personal effects and baggage of medically evacuated, emergency leave, or other special category personnel.
- Coordinate materiel transshipment to supported units.
- Coordinate preservation, packaging, packing, and marking operations.
- Certify hazardous materials for shipment.

1010. Terminal Operations Organizations

TOOs provide integral support to the deployment and distribution system at strategic, operational, and tactical nodes. TOOs do not function under the operational control (OPCON) of the MDDOC. To enable synchronization and create efficiencies between the MDDOC and TOOs, often TOOs will receive direct tasking from the MDDOC. MAGTF Commanders can either assign or attach TOOs to the Command Element or other MSCs as necessary. Examples of TOOs include the A/DACG, port operations group, beach operations group, railhead operations group, and the MCC of the Landing Force Support Party. The TOOs will task organize based on the type of operation they support and with sourcing primarily from the LCE. The Marine logistics group will provide the nucleus for all terminal organizations through its combat logistics battalions (CLB). Other units within the LCE and other MSCs may augment a TOO to perform the following tasks:

- Establish support and execute priorities as designated by the MDDOC.
- Provide terminal operation support for various nodes and sources of transportation.
- Report information to support Movement Control Boards and WGs.
- Provide personnel and equipment for the loading, unloading, and movement of personnel, supplies, and equipment at ports, beaches, railheads, airheads, cargo terminals, supply dumps, and depots

1011. Primary Staff

a. G-2/S-2

The G-2/S-2 conducts route analysis studies to determine risk associated with ground movement operations. This analysis includes all things that may delay, disrupt, degrade, and/or prevent movement along specific routes. The G-2/S-2 informs the G-3 and G-4 of recommended current and future routes. The G-3 approves route recommendations, and the MMCC and appropriate MCCs/MCAs manage them. In most cases, the LCE G-2 will produce a ground LOCs assessment that specifically and graphically depicts this type of information. Refer to MCRP 2-10B.1, *Intelligence Preparation of the Battlefield-Battlespace*, for more information regarding Intelligence Support to Ground Movement Operations.

b. G-3/S-3

The G-3 plans and directs the positioning and maneuver of combat, CS, and combat service support (CSS) units within the MAGTF AO. The use of MSRs/alternate supply routes (ASRs) for military purposes constitutes an operational decision informed by intelligence assessments and operational/logistical requirements. This will require active engagement by the MAGTF G-3 and/or adjacent commands for route segments within their AO as well as compliance with HHQ movement control guidance. The G-3, coordinating with the G-4 and MDO, ensures integration of the movement control plan with the MAGTF's scheme of maneuver, security plan, and the establishment of priorities for movement along surface and air routes. Maneuver will normally have priority over movement. However, due to the operational need to echelon CSS trains and the immediate requirement for sustainment, staffs must fully coordinate movement with maneuver elements to prevent route congestion, enforce movement priorities, and ensure continuous

logistic support. Movement planners must carefully consider forward and rearward movements along the same LOCs and through critical chokepoints.

c. G-4/S-4

The G-4 develops the concept of logistic support and advocates for logistic priorities for movement. Through the Force Transportation Board, the G-3 and G-4 establish priorities for use of MSRs. The G-4 plans and coordinates the support with external logistics units and higher and adjacent commands to support the MAGTF.

d. MDDOC Officer in Charge

The MDDOC Officer in Charge (OIC) coordinates and directs the integrated deployment and distribution planning and operations across the MAGTF by working in close coordination with other staff representatives. The MDDOC OIC serves as the overall deployment and distribution capacity manager within the MAGTF and has the authority to source distribution resources and transportation assets across the MAGTF and/or redirect in-transit assets best positioned to support the MAGTF's mission. MDDOC OIC roles may include:

- Provides deployment and distribution planning capability to the MAGTF, bridging subordinate MAGTF organizations, and the respective Marine Corps Forces Component headquarters as well as theater functional commands.
- Conducts logistics chain planning and integration with worldwide supply chains and distribution networks including sustainment level maintenance and strategic prepositioning stocks.
- Conducts joint and multi-national integrated planning and execution with HN support.
- Recommends route repair priorities and improvements for LOCs across the MAGTF AO in coordination with MAGTF engineers.

e. Strategic Mobility Officer/Air Mobility Command Liaison Officer

The Strategic Mobility Officer (SMO)/AMC Liaison Officer and/or an embarkation officer located within the MAGTF G-4 holds responsibility for managing and monitoring the deployment and distribution operations via strategic surface and air capabilities. The SMO identifies and tasks airlift assets based upon mission requirement. This may require liaison with external agencies such as the Contingency Response Element or contingency response team. The SMO will register strategic surface and air requirements and allocation with the goal of increasing effectiveness and efficiency. The SMO can coordinate Marine Corps movement requirements with the GCC, the JDDOC/JMC, and USTRANSCOM. The SMO will coordinate with the SDDC, A/DACG, Contingency Response Element (formerly known as Tanker Airlift Control Element [TACC]), TOO, and Air Liaison Element /Surface Liaison Element to support the MAGTF. The SMO will publish strategic lift policy and oversee the MAGTF's 463L pallet inventory.

Part II: Movement Control Planning

Movement Control planning follows the planning hierarchy of conceptual, functional, and detailed planning. Planners must allocate personnel and other resources, such as communications systems as Movement Control becomes a planning factor in order to execute the MAGTF's transportation plan. Using an analysis of the physical network, planners must describe how they synchronize movements to enhance throughput while avoiding congestion along LOCs and at transportation nodes. Planners should also consider how to maintain ITV and how to assess the system's nodal throughput and LOC capacities (Measures of Performance) to ensure the effectiveness of MAGTFs transportation plan (Measures of Effectiveness).

2001. Throughput Concept

The throughput concept provides a vision of the logistical infrastructure and the governance that links production logistics to consumer logistics ensuring sustainability of the operating forces.

The distribution system consists of LOCs; any pipelines or associated transportation systems; posts, bases, and airfields; and civilian agencies and supporting forces that operate those facilities, installations, networks, or systems.

In planning, the commander provides a concept of operations and establishes priorities that drive logistics and transportation requirements. The transportation planner develops a throughput concept that accommodates both known and anticipated transportation requirements by applying six basic steps.

a. Assessing the Situation

During Problem Framing, logisticians and transportation planners must conduct a Physical Network Analysis (PNA) of the distribution system. The PNA depicts a comprehensive logistics picture of all infrastructure, real estate, nodes, chokepoints, capabilities, and limitations that could positively or negatively impact throughput and distribution. Logisticians must stay involved in developing and refining the PNA. The PNA must evolve as the theater develops. The PNA delineates throughput capacity and internal transportation requirements directly affecting the coordination and preparation of the throughput concept.

Transportation planners, supported by intelligence and engineer planners, study enemy, environment, and HN resources in the operational area to determine the capabilities of the different parts of the distribution system. Through a coordinated staff analysis, transportation planners can determine the suitability and feasibility of moving supplies and personnel through nodes and LOCs accounting for existing or potential threats, obstacles, and/or hostile actions that may disrupt movements. Based on this analysis, MAGTF transportation planners begin to develop the tasks for the MSCs to maximize the transportation network.

The transportation planners coordinate within the JDDE across joint capability providers (Army, Navy, Air Force, USTRANSCOM), DLA, and the HN to determine their capability to receive, handle, and load by various transportation modes and nodes. This capability is based on the availability of MHE, cargo handling equipment, ramps, labor, storage capacity, and other factors that affect transportation services via their organic capabilities and HN support agreements. Transportation planners need this information to efficiently schedule transportation and prevent congestion. An effective throughput concept is vital for successful support of combat operations. Therefore, supported units must provide accurate data when developing transportation requirements and inform transportation planners of current and projected operating sites.

b. Determining Requirements

Accurate requirements provide the key to developing an effective throughput and distribution concept. Planners must submit forecasts far enough in advance for the transportation and supply systems to adjust their resources to meet the requirements. Transportation planners use planning periods for forecasting requirements. They base the length of these periods on the number of units and types of operations. Changes to units or operations generate a new planning period to reflect the change in forecasted requirements.

Planners must identify special handling requirements such as refrigerated, hazardous, explosive, and controlled/sensitive cargo early in the planning process in order to apply appropriate resources to transport these items. Planners can group personnel movement estimates by category such as troops, civilians, patients, or enemy prisoners of war. The MSCs must provide sustainment and movement requirements that exceed organic transportation capability for inclusion in the movement plan, consideration for task-organization, and assignment of command and support relationships.

Transportation planners develop a logistical synchronization matrix to represent specific movements, including CSS requirements, with time and space considerations across the MAGTF.

c. Determining Capabilities

Transportation planners at each MSC and/or MSE must determine their organic capabilities by working with their respective UMCCs, G-4/S-4's, and LCE G-3/S-3's. Planners must obtain the characteristics and capabilities of the following:

- Number of subordinate command transportation units, type of equipment available, and capacity to support common-user movement requirements.
- Identify HN capacity to include the total number of HN transportation assets allocated to support common-user movement requirements.
- Ascertain rail, inland waterways, and coastal shipping if available and feasible.
- Establish the number of HN and U.S.-contracted assets in direct support of the MAGTF.
- Reception, material handling, and in-transit storage capabilities.
- Communication capabilities (between TOOs, Distribution Liaison Cells, UMCCs, MMCC, etc.).
- Route clearance, maintenance, and security capacity.

Transportation planners will realize that requirements normally exceed allocated transport capacity. Using the Transportation Capacity Planning Tool (TCPT) across the MAGTF, transportation planners can maintain awareness of current capabilities as units update capacity allocation and readiness. We cannot simply resolve throughput with greater lift capacity. Planners require an understanding of the other factors that facilitate throughput such as customs clearance, security inspections, MHE and container-handling equipment (CHE) availability, weather, infrastructure, and manpower.

d. Balancing Requirements With Capabilities

Balancing requirements with capabilities identifies potential shortfalls or where the MAGTF may require mitigating actions. Planners must not fixate on capabilities alone but must consider the entire distribution system, tactical situation, priority of movement, and risk of failure. As a result, transportation planners determine the throughput needed at each node via the various modes to maximize efficiencies and assign requirements to units in a logical manner. Transportation planners may consider linking requirements to a certain capability (e.g. mail and exchange services via aviation or ground). For example, if a critical shipment must move into an area accessible by multiple road routes and only one rail route, it appears wiser to program the road route. We could use the rail segment for less critical requirements.

Planners must consider the following workload requirements:

- Direct shipments.

- Multiple destinations.
- Transfer points.
- Crew rest.
- Equipment Readiness.
- Limited asset availability (e.g. air delivery equipment, HST slings, and nets).
- Balancing requirements with capabilities.
- Retrograde and return shipments.
- Intermodal shipments.

e. Determining Shortfalls, Critical Points, and Solutions

Balancing the importance of unit movements with sustainment, planners must identify potential shortfalls in transportation assets and equipment capabilities and prioritize movements according to the commander's guidance. Significant shortfalls will generate requests for additional transportation capability and/or notification to the commander of the impact on the operational mission.

Planners must also identify critical points or terrain features where restrictions create limitations that could impede or halt movement. Areas of concern for air, sea, and ground movement may include the following:

- Terminals.
- Ports.
- Beach landing zones.
- Airheads.
- Railheads.
- Bridges.
- Tunnels.
- Highway/traffic choke points.
- Cargo transfer points.
- Warehousing.
- Customs or country clearance requirements.
- Channelizing terrain.
- High threat areas.
- Flight restrictions/no-fly zones.

After identifying these nodes or terrain features, planners must coordinate with the G-3/S-3 to identify triggers to shift locations or to mitigate threats via aviation, aviation ground support, CSS, and CS enablers.

The MDDOC with the MMDC will also consider co-locating distribution liaison cells at key transportation hubs to supervise and facilitate onward movement of personnel and classes of supply.

2002. Route Synchronization Planning

The objectives of developing a route synchronization plan include sustaining ground movements and providing effective and efficient use of road networks. Deliberate planning results in a route synchronization and traffic circulation plan contained in Appendix 4, Mobility and Transportation, of Annex D, Logistics of the operation plan (OPLAN). See Appendix B and C of this pamphlet for examples.

An overlay with specified control measures aligned and deconflicted with the MAGTF G-3/S-3 and theater MCAs should accompany the synchronization plan. Control measures must also align with phases of the operation, when applicable.

a. Main Supply Routes

The G-3/S-3 is responsible for terrain management and must approve MSRs and ASRs before transportation planners develop the route synchronization plan. Ideally, all supply routes support the volume of traffic

necessary to meet planned and anticipated movement requirements. Designating and graphically depicting MSRs and ASRs should extend well beyond the current MAGTF AO, consider adjacent forces, and anticipate follow-on operations. Assign shared MSRs only one name throughout the theater to avoid confusion.

b. Critical Points

Critical points become Named Areas of Interest (NAIs) for transportation planners. The identification of critical points along a route enables planners to make informed decisions when directing routes for a given mission. The G-2/S-2 will initiate the development of the Intelligence Preparation of the Battlespace; however, if a movement requires specific characteristics to reduce the uncertainty associated with making a decision on using a specific route, the transportation planner can submit a request for information to their G-2/S-2.

The commander must treat the critical points as NAIs to ensure visibility of actions at that critical point and protection required in order to sustain distribution efforts/activities. The Route Synchronization Plan will not list every critical point but only the most important ones that affect traffic flow. In addition to the critical points listed in paragraph 2001e, critical points might include the following:

- Roadway structures or features that limit road width, overhead clearance, or military load class. These include overpasses, bridges, tunnels, and degraded road surface conditions.
- Chokepoints such as ferries, fords, and sharp turns under a 30-meter (100-foot) radius.
- Urban areas.
- Peak traffic congestion periods and locations of local populace.
- Cultural considerations.

c. Control Measures for Each Route

Transportation planners base control measures on engineer route reconnaissance and route classifications; planned and anticipated traffic volume; mission, enemy, terrain and weather, troops and support available—time available; and critical points. Planners must also consider the capabilities of MCAs and TOOs to enforce the control measures. Control measures will likely change based on the phases of an operation. The MMCC with the G-3/S-3 must ensure they incorporate changes based on operations into fragmentary orders as well as information systems in a timely manner. Respective COCs should integrate movement control measures into the common operational picture/CTP as well as MAGTF logistics support systems such as TCPT or SharePoint. Planners can assign permissive or restrictive movement control measures to routes and checkpoints (CPs); however, they should logically align with control measures within the MAGTF AO and joint area of responsibility (AOR). Per Army Technique Publication (ATP) 4-16, *Movement Control*, five route classifications define varying levels of control:

- **Open Route.** The least restrictive control measure indicates any unit may use the route without a convoy clearance or request. Minimum control is exercised.
- **Supervised Route.** The MMCC/UMCC will specify the size of convoys, the type of traffic, or characteristics of vehicles that require a convoy clearance to use the route. Limited control is exercised.
- **Dispatch Route.** A dispatch route requires a Ground Transportation Request (GTR) regardless of the number or types of vehicles. A dispatch route designates when traffic volume is expected to exceed capacity or when the route is critical to operations and priority of use is strictly enforced. Full control is exercised.
- **Reserved Route.** The route remains reserved for the exclusive use of a particular unit(s) or type of traffic and no other units/traffic may use the route. Planners may identify reserved routes for large unit movements. Examples include battle handovers, passage of lines, commitment of the reserve, or withdrawals.
- **Prohibited Route.** The route is closed and no unit/traffic may use it. Prohibited routes may result from washouts, destroyed bridges, threat considerations, construction work, or an intent to not interfere

with local peak traffic congestion. Availability depends on the nature of the closure, (e.g. repairs from battle damage).

d. Checkpoints

CPs segment ground LOCs to control movement, segment route classifications and threat conditions, and identify force protection coordination requirements. The CPs provide a means to regulate and control movement. When submitting a GTR, the moving unit uses CPs to identify their start point, release point (RP), and route. These CPs enable quick dissemination of information during execution. Planners establish CPs at easily recognizable features such as the following:

- Major crossroads.
- Locations where road conditions change.
- Major supply or service areas.
- Borders and unit boundaries.
- Locations where threat levels change.
- Critical points, as appropriate.

In addition, MAGTFs can use CPs to coordinate intelligence, surveillance, and reconnaissance coverage; quick reaction force; explosive ordinance disposal support; convoy escorts; and support route improvement prioritization. Properly used, CPs provide a common reference when describing routes in the route synchronization plan. Some examples follow:

- “MSR Spear is a paved all-weather road from CP 22 to CP 34.”
- “From CP 34 to the division rear boundary, the MSR is an improved four-lane fair weather road.”
- “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 rear boundary. Convoys of eight or more vehicles, tracked vehicles, or vehicles that cannot maintain a 20 miles per hour (MPH) march rate require a convoy clearance on that segment.”
- “The most restrictive route feature is at CP 35, a bridge with a military load classification of 30. Vehicles with a military load classification greater than 30 must use the ford at NJ334098. Signs for the ford are posted.”
- “Route Spear is considered black for northbound traffic at CP 23 until 2300, due to a collapsed bridge span on the northbound lane across the Han River. Current efforts are in place to re-establish two-way traffic on the southbound span, but expect delays until the chokepoint repairs are completed o/a 23 Feb.”

The MMCC in coordination with UMCC’s should identify sufficient CPs to adequately exercise control but no more than they have the capability to manage or enable execution.

e. Traffic Circulation Plan

The traffic circulation plan provides an overlay that shows all MSRs and ASRs, CPs, restrictive route features, and critical points. It also identifies the routes by type, include route names, direction of travel, boundaries, key distribution nodes, route classification, and potentially the lead unit of the TOO. See Appendix D, Traffic Circulation Overlay, for an example.

f. Reporting Requirements

The MMCC must coordinate reporting requirements with the MAGTF G-3/S-3 and G-4/S-4 to avoid duplicate or excessive reporting. Any movement control report must align with the information management plan and the operation order reports matrix. The intent of any such report is to provide information in support of assessing the effectiveness of the distribution system.

MAGTF G-3/S-3 and G-4/S-4 should clearly define reporting and monitoring requirements for MCAs and units to rapidly disseminate information across the distribution chain in concert with maintaining the AO Commander's situational awareness. MCAs will delineate who initiates reports, who receives reports, tactical communication nets, and the reporting frequency.

g. Plan Transition

Operation plans, orders, and staff/functional estimates contain essential information. The MAGTF G-3/S-3 and MDO must distribute movement control plans and orders in a timely manner to all units and MCAs. This ensures common awareness and understanding of the plan as a basis for timely adaptation in execution. These plans, built upon existing SOPs, must contain information regarding task organization, priorities, roles and responsibilities, processes, and the location of major supply activities. Confirmation briefs, rehearsals, and rehearsal of concept drills provide valuable techniques for ensuring the plan or order is understood and executable.

Part III: Movement Control Execution

The UMCCs serve as key elements in meeting transportation requirements through the efficient use of organic capabilities and clear identification of transportation requirements to HHQ via the MAGTF's request process. Movement requirements are either planned or immediate. We identify planned movements in advance of operations to allow for allocation of transportation requirements among all available modes. Immediate movements surface as urgent requests submitted through the operational chain. Immediate movements can include vital resupply of Classes I, V, VIII, or other materiel deemed a priority by the AO Commander and take precedence over planned movements. Operations and transportation planners must enforce discipline when generating transportation requirements or movement control will become an ineffective and inefficient reactionary process.

3001. Request and Validation Procedures

The MAGTFs adopted the TCPT, a web-based application, to plan and execute ground-based transportation operations. The TCPT allows transportation planners to request, coordinate, and track ground movement requirements; plan, task, and monitor convoys; track transportation and engineering capacity; and request and approve battlespace clearance for movements. Hence, the TCPT provides a management tool for all levels of the MAGTF. GTMRs, GTRs, GTOs, and convoy missions are processes often used to request and validate ground based movement.

a. Transportation Movement Request

A unit submits a TMR when a movement requirement exceeds organic capability or capacity. A unit may submit the TMR using TCPT or by using the TCPT TMR integration feature in Common Logistics Command and Control System (CLC2S). In both processes, a unit creates a TMR within TCPT that the appropriate MCC(s) use to fulfill transportation support requirements.

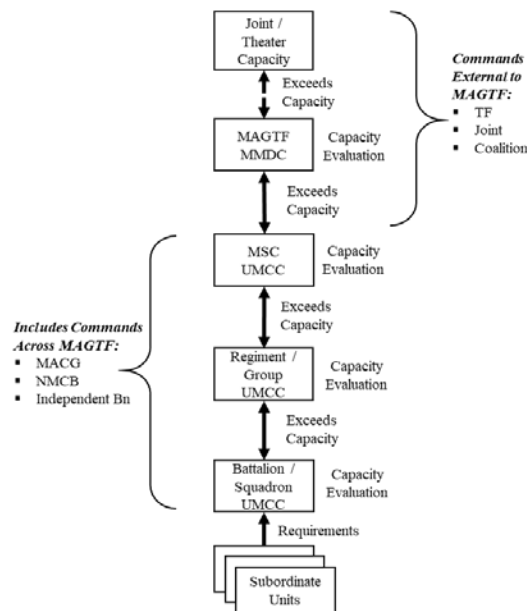


Fig 3-1. Notional TMR Process

b. Ground Transportation Request

A unit enters a GTR into TCPT to ensure the approval of cross boundary ground movements by the appropriate MCC(s) and can be tracked across the MAGTF. See Appendix F for a sample GTR CONOPS.

c. Ground Transportation Order

The Transportation Board/Movement Control Board publishes approved GTRs daily in the MAGTF GTO.

d. Convoy Missions

Aviation Ground Support, CSS, and CS units will build convoy missions to finalize the transportation planning process. Convoy mission planning provides all necessary details and final coordination for execution. TCPT enables transportation planners to assign TMRs, equipment, and personnel to a mission.

3002. Movement Control Board/Movement Control Working Group

The MDDOC and MMCC must establish and participate in boards, cells, centers, or WGs necessary to support movement control. The primary battle rhythm events established for movement control include the Movement Control WG and Movement Control Board (also known as a Force Transportation Board or Surface Transportation Board). Depending on the scope and tempo of operations, the Movement Control Board and Movement Control WG may merge. In most cases, requirements will exceed capabilities of both the routes and the MAGTF's organic transportation assets. The MDO consolidates GTRs requiring higher approval and all unfulfilled TMRs to prioritize and allocate transportation tasks across the MAGTF. See Appendix E for a Movement Control Board organizational template (often referred to as a Seven Minute Drill).

a. Board Membership

The MAGTF G-3/S-3 Current Operations Officer and MDO or Deputy MDO will chair the board facilitated by the MMCC. The following staff and units should participate:

- MMCC
- CE UMCC
- Ground Combat Element (GCE) UMCC
- Aviation Combat Element UMCC
- LCE UMCC
- MMDC
- MAGTF Engineer
- MAGTF Air Officer
- MAGTF Assessments
- MAGTF Intelligence
- Adjacent Commands (including representation of the HN)
- Supporting Command(s) (e.g. U.S. Army Support Battalions)
- Supporting Transportation Contractor, if applicable and cleared

b. Board Purpose and Mode Selection

The purpose of this board is to prioritize all TMR/GTRs and unfilled TMRs 72-hours or more from the required dispatch date. The board and all MCAs at lower levels should employ all available transportation assets to fulfill requirements. This includes balancing both ground and aviation capabilities. The MCAs should fulfill requirements by committing transportation assets according to MAGTF priorities, selecting the most efficient and effective mode and method to meet the required delivery date. Additionally, WG/board members brief the status of TMR/GTRs channeled to higher and supporting commands.

The board must consider many other factors in selecting a mode. These factors include:

- **Mission Considerations.** Provide support according to need based on command priorities.
- **Force Protection Considerations.** Consider security and route clearance requirements for shipments involving hazardous, classified cargo, ammunition, or other sensitive cargo.
- **Host Nation Considerations.** Coordinate with the Civil Affairs or Civil Military Affairs Officer to determine if HN factors could influence the distribution network. This may require movement at night, by air, or in smaller units.
- **Tactical Considerations.** Coordinate with the requesting unit to determine potential changes in pickup or delivery locations.
- **Highway Considerations.** MAGTFs may require rerouting if changes to route classifications, the distribution pattern, or force protection concerns occur.
- **Rail Considerations.** Limit use to lines that support supply activities or transfer points where available MHE and personnel can transfer cargo to trucks.
- **Air Considerations.** Limit use to aircraft allocated for CSS air movement operations or approved requests.
- **Inland Waterway Considerations.** Limit use to the availability of barges or boats, cargo transfer units and equipment, and channels capable of accommodating the types of available craft.
- **Contracted Assets.** Limit use to those modes and assets provided by the host country or contracted service provider.

c. Board Output

The main outputs of the Movement Control Board include the GTO, published route status and restrictions, and the prioritized assault support requests for the MAGTF Air Officer to integrate into future air tasking orders. The GTO should include direction on allocation of transportation assets/units to fulfill approved TMRs, a list of approved GTRs, and validated additional general or special instructions by AO commanders or MCAs for convoy planning.

3003. Routing and Scheduling

Routing and scheduling remain critical to movement control. Failure to ensure accurate and complete routing and scheduling results in a transportation system that will not support the concept of operations and may lead to the failure of a unit to accomplish its mission. Prior to the meeting of a Movement Control Board, the responsible MCA or UMCC will coordinate with AO commanders to approve subordinate or supporting unit submitted GTRs. At the Movement Control Board, the MMCC will review GTRs for the next 96 hours with MSC/E UMCCs. Conduct final coordination to ensure available assets can support the projected GTR routes and schedules based on current route status and verify deconfliction of GTRs with current and future operations. The MMCC conducts/directs final adjustments to GTRs as necessary in the form of a draft GTO. After the Movement Control Board, the MMCC publishes the GTO with validated GTRs for the following day.

a. Routing

Routing includes the process of coordinating or directing movements on MSRs or ASRs. When routing traffic, UMCCs should consider the four principles that govern routing. The four fundamentals that govern routing are defined as follows:

- **Balance.** This process matches vehicle characteristics with route characteristics. Balance ensures that traffic never routinely exceeds the most limiting feature of a route. It considers the military load classification of the vehicles, bridges, and the route. Balancing also identifies requirements for upgrading routes or ordering caution crossings for certain bridges. Planners obtain route characteristics during the planning process.
- **Separation.** This process allocates road space for movements to ensure movements do not conflict. Separation prevents congestion on regulated routes. Movement managers must not allocate the same road

space or time blocks to more than one movement requirement. A time phased approach will enhance proper use of multiple units needing the same road space. Additionally, transportation planners can request the G-2/S-2 produce a pattern of life analysis on each route that will indicate times when congestion/traffic occurs.

- **Distribution.** This process allocates as many routes as possible to reduce the potential for congestion and prevent deterioration of road surfaces. Distribution also promotes passive defense by distributing and separating traffic. Weigh and balance the benefits of distribution against increased force protection assets required for securing more road networks.

- **Prioritization.** Movement planners assign route priority to the most essential movements necessary to accomplish the mission. Assign the highest priority traffic to routes that provide minimal time-distance factors and meet the route capacity requirements and movement schedule of the moving unit.

Other routing considerations include:

- Assigning highest priority traffic to the fastest routes.
- Separation of military movements from civilian traffic.
- Separation of motor movements from pedestrian movements.
- Shipment consolidation.
- Sustaining route capabilities.

b. Scheduling

Scheduling is the process of coordinating times for road movements. It involves receiving movement requests, managing requests, and issuing convoy approval. When scheduling movements, units should ensure they:

- Apply command priorities.
- Apply the fundamentals of routing to reduce delays, conflicts, and congestion.
- Conduct detailed planning for large unit or high-priority movements.
- Reserve time for route maintenance.
- Reroute or holding movements based on changes in priority or the tactical situation.
- Task of route clearance and security.

The following fundamentals apply in scheduling movements.

- Movements on routes requiring movement clearance must be scheduled.
- Movements that cross different AO boundaries must be scheduled, coordinated, and cleared with all movement control organizations responsible for the battlespace that a convoy moves through.
- Coordinate tactical maneuver of large units with the responsible MCAs in order to redirect lower priority (routine) movements.
- Treat movements in one direction on routes that require a convoy clearance as a single movement regardless of the distance or time involved. Each movement retains the same convoy clearance number to destination.
- Provide schedules and changes to schedules due to immediate movement requirements to the AO Commander's COC to execute route synchronization and provide traffic control. Base the method of scheduling road movements on the control measures specified for the route.

The four types of scheduling methods are infiltration, route, location, and column. These methods (from the least restrictive to the most restrictive) are described below:

- **Infiltration Schedule.** This schedule assigns a rate of dispatch to units for specific routes and time blocks to achieve an average traffic flow 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 remain within desired limits. MAGTFs can use an infiltration schedule for open or supervised routes.

- **Route Schedule.** This schedule, the most common method used by Marine MCAs, provides a flexible scheduling method. It apportions blocks of time on MSRs to units, types of movements, phases of

the operation, or for route maintenance. MAGTFs can use a route schedule for supervised, dispatch, or reserved routes.

- **Location Schedule.** This schedule is more restrictive than an infiltration or route schedule. It assigns “arrive” 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 schedule to arrive at 1000 and to clear at 1015, unit “B” will arrive at 1020 and clear at 1030. MAGTFs can use a location schedule for supervised or dispatch routes.

- **Column Schedule.** This schedule encompasses the most restrictive scheduling method. It specifies “arrive” and “clear” times at CPs along an entire route. MAGTFs can base this schedule on the requestor’s movement request, 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 movement. MAGTFs can use the column schedule for supervised, dispatch, or reserved routes. It can also be used when MAGTFs anticipate congestion. This method would not work in more primitive road networks or those with higher enemy activity.

3004. Route Assessment Process

Not specifically defined in joint or USMC doctrine, this pamphlet defines route assessment as, “a continuous analysis that measures the effects of friendly, enemy, and environmental activity on surface MSRs/ASRs and distribution infrastructure.” The current and future conditions along primary MSRs and ASRs within the MAGTF Commander’s AO and JFC’s AOR that support distribution operations remain essential to convoy planning.

Since MSRs and ASRs often cross multiple unit boundaries and various units travel at different frequencies, a requirement exists for a centralized element to provide information on routes providing a common reference for consistent route assessments across the battlespace. Identifying who and where this responsibility lies may become a contentious topic if not coordinated in advance. Regardless of the arrangement, the route assessment must support a CTP and facilitate disseminating the most current information available to all COCs and MCAs.

The two components of a route assessment include the technical route classification (see MCRP 3-34.3 *Engineer Reconnaissance*) and intelligence analysis. Within a MAGTF operation order or other directive, MAGTFs must designate a staff section or unit responsibility for maintaining the MAGTF’s route assessment. MAGTFs must resource this element with sufficient authority, intelligence, and engineers to develop an effective and timely assessment. The MAGTF and LCE G-2/S-2 maintain intelligence analysis of current and planned MSR/ASRs within the MAGTF AO.

MAGTF G-2/S-2, G-3/S-3, G-3/S-3 Engineer, G-4/S-4 MMCC, and LCE G-2/S-2 and G-3/S-3 must determine the roles, responsibilities, and processes for developing and maintaining route assessments across the MAGTF’s AO and how route assessment information will be shared

The technical component of the route assessment consists of a road reconnaissance. As described in ATP 3-34.81/MCWP 3-34.3, *Engineer Reconnaissance* (formerly MCWP 3-17.4), a road reconnaissance is necessary to make a route classification. A route classification is assigned to a route based on factors of minimum width, worst route type, lowest bridge, raft, culvert military load classification, and obstructions to traffic flow. A road reconnaissance is a specific sub-component to route reconnaissance. As one of three forms of tactical engineer reconnaissance, MAGTFs may task route or area reconnaissance to an engineer unit within the MAGTF or any unit as long as it is resourced appropriately. The MAGTF should delegate responsibility for route and area reconnaissance to AO commanders. The MAGTF may also request augmentation for a U.S. Army Corps of Engineers Forward Engineer Support Team (FEST) for rearward or extensive reconnaissance efforts. A FEST can conduct route reconnaissance, technical engineer support, and limited design capability within a theater.

When unable to source route reconnaissance, the G-2/S-2 should integrate physical route reconnaissance with other intelligence collection capabilities. By incorporating aerial reconnaissance and geo-tagged cameras on convoys, G-2/S-2 can collect information for analysis and dissemination. Even without collection assets, G-2/S-2 should task every convoy to collect on a particular section of a route and report those findings via the convoy debrief. Based on the frequency of convoys, the staff can update route conditions as designated by the unit responsible for the route assessment.

The effectiveness and tempo of enemy activity requires timely collection and analysis from multiple intelligence sources and operational reports. Based on the magnitude of this information, the MAGTF and LCE G-2/S-2 coordinate to maintain intelligence analysis of current and planned MSR/ASRs within the MAGTF AO. The threat analysis should provide a metric on the likelihood and strength of enemy activity. MAGTFs must tie this metric to increasing force protection measures for a convoy to move along the route. Increased force protection requirements could include the following:

- Movement restricted to low light hours.
- Composition of crew served weapons within the convoy.
- Scheduling route clearance to precede the convoy (via joint forces for mounted route clearance capabilities).
- Increase the number of security vehicles.
- Rotary wing/unmanned aircraft escort/overwatch.
- AO commander providing a screening force.

Depending on the task organization of the MAGTF, the intelligence requirements supporting the route assessment drive operations by initiating tasks to route clearance platoons, engineer units, and AO commanders to maintain a constant flow of information on MSRs and ASRs. ATP 4-16, Appendix F, Figure F-1 provides an example of route status reporting based on color code and friendly, enemy, and environmental contexts.

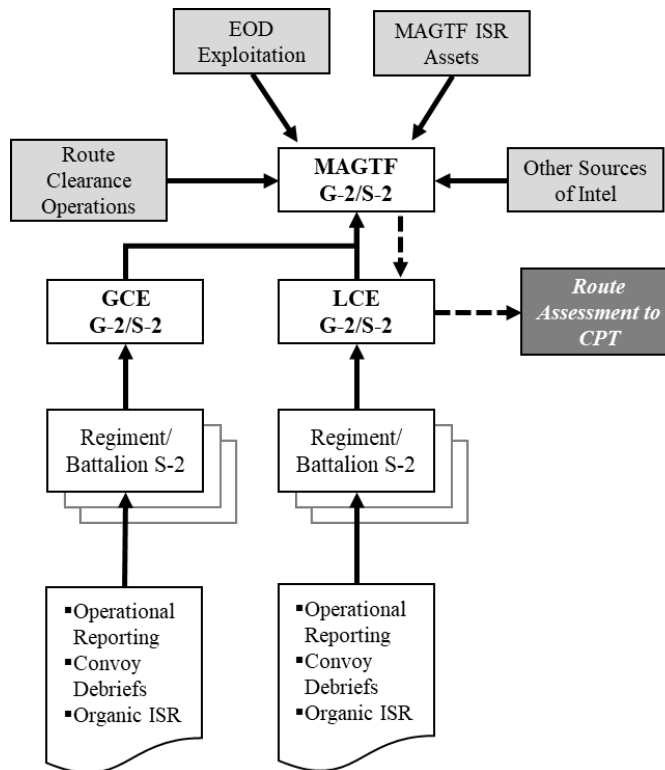


Figure 3-2. Example Route Assessment Process

3005. Automated Information Systems

The Movement Control WG/Force Transportation Board outputs support transportation requirements across the MAGTF. AIS and ITV provide transportation planners and MCAs with the capacity to plan, prioritize and provide visibility to monitor and control the movement of personnel, cargo, and vehicles. The two main systems employed include TCPT and CLC2S.

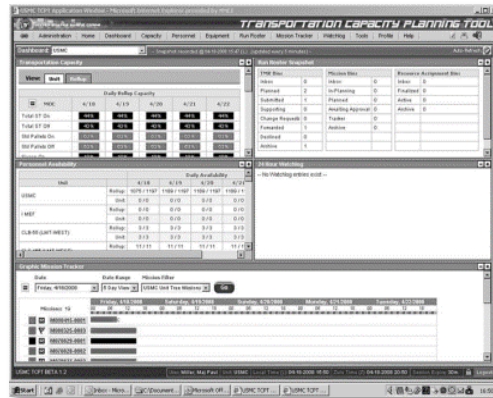
a. Transportation Capacity Planning Tool

TCPT is a management tool that focuses on transportation capacity planning capabilities at the resource allocation and assignment level. It allows transportation planners at all levels of the MAGTF to view transportation capacity in an online environment through an integrated association of transportation taskers, personnel, and equipment resources. MAGTFs can use TCPT both as a mechanism for requesting transportation support and the means to approve requests and assign resources for execution.

The Transportation Board may use the TCPT Mission Tracker module to generate the GTO and display all planned and ongoing missions. Mission visibility extends beyond mode operators and transportation requesters to UMCC representatives in all COCs that maintain TCPT as a battle command display.

While TCPT provides a holistic transportation planning capability, it has some distinct strengths and weaknesses that MAGTFs must consider while incorporating the system into the movement control process. The foremost strength of the system provides the capability to build a system architecture that mirrors the composition of the MAGTF. When subordinate commands populate TCPT with their respective unit resources, it provides the planners with the ability to project capacity and assign support to achieve the MAGTF Commander's objectives. The system provides a single mechanism for the submission of a GTR across the MAGTF and the ability to produce the daily GTO. TCPT, through the GTO, assigns commands with missions for execution based on resources available. The system additionally provides the mechanism

for the entry, submission, and management of ground transportation taskers within each echelon of the MAGTF.



The distinct TCPT limitation is the lack of interoperability with other logistical support systems. It requires manual input of data to maximize its full capabilities. While TCPT draws in feeds from radio frequency identification that facilitate the tracking of cargo, it does not interface with tactical systems to track convoys during execution. This requires manual update of key tactical information.

For more information on the capabilities of TCPT refer to <https://www.tcpt1.usmc.mil/tcpt/>.

b. Common Logistics Command and Control System

CLC2S supports the logistics warfighting function. The web-based logistics C2 tool provides situational awareness and enables decision making for MAGTF commanders and staffs. MAGTFs commonly employ CLC2S to process rapid logistics and supply requests.

CLC2S provides a means to request, track, and prioritize incoming support requests. The system contains four modules that when used together, provide a near real time operating picture to leaders at each echelon. MAGTFs can employ the CLC2S application using the COC equipment or deployable servers/laptops across the MAGTF. It provides ad hoc capability, historic unit effectiveness, enables information analysis, and establishes thresholds for C2 and command tracked items.

CLC2S can interface with capabilities of the Integrated Data Environment/Global Transportation Network (GTN), Joint Battle Command Platform (JBC-P) and Radio-Frequency in-Transit Visibility (RF-ITV).

3006. In-Transit Visibility Systems

MAGTFs can maintain visibility of theater and MAGTF surface movements and associated cargo using the systems highlighted below.

a. Integrated Data Environment/Global Transportation Network Convergence

The USTRANSCOM Global Transportation Network (GTN) and DLA Enterprise Business System "converged" to provide the DOD an integrated set of networked, end-to-end visibility, deployment, and distribution capabilities.

Respective MAGTF G-4/S-4s and the MDDOC may use the capabilities of this merger to track JRSO&I and supply chain management transportation requirements at the strategic level. Visibility provided through dashboards facilitates the development of MAGTF movement control plans earlier in the forecasting cycle.

The Integrated Data Environment/GTN Convergence provides supply chain, distribution, and logistics information fusion through common, integrated data and application services. It enables the development of cohesive C2 and business-decision solutions. In addition, the system is interoperable with both TCPT and CLC2S.

b. Joint Battle Command Platform

JBC-P is primarily a maneuver system. In the context of movement control, the system provides the status of tactical convoys through sensor integration resulting in near real-time battlefield situational awareness. JBC-P synchronizes tactical execution, updates unit personnel in respective UMCC's, and alerts staffs within the MDDOC facilitating a clear picture of all movement within the MAGTF AO.

JBC-P interfaces with CLC2S supporting a feed of data into the logistics COP/CTP. With inputs from the MAGTF G-3/S-3 and/or MDDOC, JBC-P will create and disseminate navigation routes and overlays and facilitate improved route planning. JBC-P does not feed directly into TCPT; however, data can transfer to TCPT via CD ROM (swivel chair concept). The system leverages standardized tactical computers, scalable and tailorable to the mission and vehicle ranging in options from a detachable tablet to a fully loaded, vehicle-mounted workstation.



c. Radio-Frequency in-Transit Visibility

(RF-ITV) is a capability designed to provide the logisticians with maximum visibility and near real-time status on the movement of all classes of supply.

RF-ITV identifies, locates, and tracks the movement of all classes of supply from the sources of supply to the final destinations through the fusion of logistics information and distribution technologies facilitating rapid crisis response, deployment, and sustainment.

It provides decision makers at all levels of command and throughout the logistics pipeline with accurate, near real-time data to collaboratively plan, prioritize, and redirect logistics operations. RF-ITV provides the capability to track and shift enroute units, equipment, and supplies. The use of RF-ITV allows the delivery of tailored logistics packages directly to the command. The RF-ITV capabilities feed directly into CLC2S supporting a feed of data into the logistics COP/CT, but it lacks interoperability with TCPT.



3007. Training Opportunities

The MAGTF Staff Training Program Division, through its Command and Control Training and Education Center of Excellence (C2 TECOE) Branch, provides operational employment training on systems within each geographical MEF. C2 TECOE bases the programs on Training and Readiness (T&R) requirements and provides the foundational skills and Tactics, Techniques, and Procedures (TTP) training through their progressive instruction.

Appendix A: Service Level Movement Control Capabilities

References:

1. ATP 4-16, *Movement Control*
2. ATP 4-11, *Army Motor Transport Operations*
3. MCRP 3-40F.7, *MTTP for Tactical Convoy Operations*
4. MCTP 3-40F, *Transportation Operations*
5. Marine Corps Order (MCO) 4470.1B, *Marine Air Ground Task Force (MAGTF) Deployment and Distribution Policy (MDDP)*

Service component forces form the basis for theater distribution operations. The following paragraphs briefly describe the Service and Special Operations Force (SOF) control and distribution management as well as movement control capabilities of each joint force component.

A-1. Marine Corps Component

Within the Marine Corps, commanders of Marine Corps Forces (MARFOR) are responsible for the development and implementation of MAGTF deployment and distribution policies. In addition to maintaining policy, the respective MARFOR is responsible for the following:

- Procedures ensuring accurate data entry into distribution related AIS/AIT.
- Providing Marine Corps Systems Command and Deputy Commandant, Installations and Logistics (DCI&L) recommended changes to distribution-related AIS/AIT programmatic maintenance and logistics support plans throughout the systems total life cycle.
- Coordination with DCI&L for funding to sustain AIS/AIT.
- Providing interface with Army theater distribution pipelines and nodes from ports of debarkation to the MAGTF.
- Evaluating subordinate force implementation and adherence policy.
- Registering the war reserve withdraw plan to meet the MAGTF Commander's unsourced requirements.

For further information on the role of the MARFOR, refer to MCO 4470.1B.

A-2. Army Component

The Army component transports personnel, cargo, and equipment by various modes of transportation to include trucks, trains, containers, flatracks, watercraft, and aircraft with organic, contracted, and/or HN assets. In addition, the Army component conducts marine and inland terminal operations to load, unload, and handle personnel, cargo, and equipment among the various modes of transportation. Marine terminal operations include fixed or improved port facilities, unimproved port facilities, or bare beach facilities that best support a logistics-over-the-shore operation. Inland terminal facilities conduct air, motor transport (MT), rail, and inland waterway transfer operations. The Army Service Component Command is responsible for providing support to Army forces and common-user logistics to other Services when assigned as the executive agent by the GCC. The Army Service Component Command provides mode operations, terminal operations, and movement control through the Theater Sustainment Command (TSC), Expeditionary Sustainment Command (ESC), Sustainment Brigade, and movement control battalion (MCB). The Army accomplishes movement control as follows:

- **Theater Sustainment Command.** The mission of the TSC is to plan, deploy, and execute operational-level logistics within a theater AO. The TSC can plan and execute operational-level Army sustainment in support of the Joint Force Land Component Commander (JFLCC) or JFC. The TSC provides a logistics C2 organization for the Army component in theater while simultaneously supporting deployment, movement, sustainment, redeployment, reconstitution, and retrograde. As the senior logistics headquarters in the AO, the GCC may designate the TSC as a joint command for logistics. When exercising this option, the GCC must identify the control and tasking authorities assigned to the TSC. In addition, the GCC must specify its command relationships with the service components.
- **Expeditionary Sustainment Command.** The ESC provides forward-based C2 of assigned units. It deploys to the AO to provide C2 when employing multiple Sustainment Brigades or when the TSC determines a requirement for a forward command presence. The ESC provides the TSC commander with the capability to provide effective operational-level logistics support to the Army component or JTF missions. The TSC may employ multiple ESCs within the theater. The ESC plans and executes sustainment, distribution, theater opening, and reception, staging, onward movement & integration. The ESC may serve as the basis for an expeditionary joint sustainment command when directed by the GCC or the designated JTF Commander.
- **Sustainment Brigade.** The sustainment brigade serves as a subordinate command of the TSC. The sustainment brigade when attached to an ESC/TSC provides C2 for all subordinate units and provides sustainment in the AO as directed by the ESC/TSC. The sustainment brigade task organizes and equips to conduct theater opening, distribution, and sustainment operations. The assigned mission determines the mix of functional and multifunctional subordinate battalions under the control of the sustainment brigade. The sustainment brigade provides staff supervision and C2 for replenishment, life support activities, human resources and financial management support, and distribution management.
- **Movement Control Battalion.** The MCB provides C2 and technical supervision to MCTs and coordinates the use of common-user transportation assets in the AO. The MCB will organize as many MCTs as needed to operate in the AO based on requirements such as the number of supported units/organizations, air, rail, inland waterway, seaport terminals, and MSR. One MCT is doctrinally allocated to an APOE, sea port of embarkation, distribution hub, or other critical movement control node. The MCB maintains sufficient personnel to establish as many as four sub-units to operate in separate locations to provide some limited aspect of movement control. The battalion provides asset visibility and maintains ITV of tactical and non-tactical moves. The MCB may assume responsibility for coordinating with the Army Program Management Office on total radio frequency identification and AIT solutions called the Automated Movement and Identification Solutions. In the current force organization, the MCB falls under the tactical control (TACON) or administrative control of the TSC or ESC. An MCB will operate under TACON or administrative control to a sustainment brigade when the sustainment brigade serves as the senior sustainment headquarters in theater. In OIF and OEF, an MCT co-located with the MAGTF CE to coordinate intra-theater movements with the MMCC.

A-3. Air Force Component

The Air Force Component Command provides intra-theater common-user airlift and air refueling capabilities, as required. Intra-theater common-user airlift missions fly on theater airlift aircraft under the OPCON of the GCC to support common-user theater movement requirements. The Air Force component controls theater airlift as follows:

- **618th Tanker Airlift Control Center.** The 618th TACC is the global air operations center (AOC) responsible for C2 of Air Force and commercial contract air mobility assets on a continuous basis. It plans, schedules, and tracks tanker, airlift, and AE aircraft worldwide to efficiently and effectively accomplish the AMC Global Reach mission.

- **Theater Air Operations Center or Joint Air Operations Center.** The Air Force defines intra-theater air mobility operations by geographic boundaries. Air mobility forces assigned or attached to that GCC normally conduct these operations. The Theater Air and Space Operations Center or Joint Air Operations Center (JAOC), if established normally schedule and control intra-theater common-user air mobility assets. The ability to identify and coordinate movement requirements (visible in JDDE-common systems) is critical to providing theater reach-back support from the 618th TACC. When intra-theater air mobility requirements exceed the capability of assigned or attached forces, other mobility forces can support intra-theater airlift requirements using a support relationship. The supported commander may also request augmentation through the request for forces process.
- **Commander, Air Force Forces.** During joint operations, it may be necessary to establish a JTF within a GCC's AO. This allows the GCC to maintain a theater-wide focus and at the same time respond to a regional requirement within the theater. When this occurs, a JTF will be designated and forces made available for this operation. The Commander Air Force Forces will normally be delegated OPCON of Air Force assets, and if designated the Joint Force Air and Space Component Commander (JFACC) will typically exercise TACON of air mobility forces made available to the JFACC. The JTF may request augmentation if it requires additional air mobility forces beyond those already made available for tasking.
- **Director of Mobility Forces.** The Commander Air Force Forces may appoint a director of mobility forces to function as coordinating authority for air mobility. The director of mobility forces should coordinate with all commands and agencies, both internal and external to the JTF including the JAOC, the 618th TACC, the JDDOC, and the JMC.

A-4. Navy Component

The Naval Component Command (NCC) provides theater sealift to the joint force. The NCC organizes and equips a transportation and distribution system to deploy and sustain forces by moving to and from ports of embarkation; conducting inter-theater movement, theater reception, intra-theater movement of personnel, cargo, and equipment; offloads at APODs/SPODs; maintaining operational control of the ports; managing throughput; conducting medical evacuation; and retrograding material. Some of the primary organizations that perform these functions include the NCC/Joint Force Maritime Component Commander, Logistics Task Force Commander, and the MSC. The commander remains aware of the common operating environment primarily through the Global Command and Control System-Maritime (GCCS-M). The NCC maintains control of the naval transportation and distribution system within the AO as follows:

- **Navy Component Command (NCC).** Naval forces are assigned to the NCCs of the GCCs. During joint operations, the NCC and/or fleet commander will be assigned as the joint force maritime component commander under the JTF. Control of the operating forces of the fleet at all echelons is exercised through the GCC.
- **Logistics Task Force Commander.** Sea and air assets performing combat logistics force functions are positioned to support each fleet commander for both the transport and distribution of materiel within the AO. A variety of staffs are manned by both U.S. Navy and MSC personnel manage these assets.
- **Military Sealift Command.** The MSC provides ocean transportation for the DOD and is responsible for providing strategic sealift and ocean transportation for all military forces overseas. MSC provides sea transportation of combat cargo to forward deployed ground, air, and naval forces.

- **Advanced Logistics Support Site / Forward Logistics Site.** The advanced logistics support site (ALSS) serves as the primary theater distribution hub. It generally provides an increased capability and greater storage area. The ALSS centers on the availability of an aerial port and seaport in relative proximity.
- An ALSS normally possesses the capabilities to receive, store, consolidate, and transfer the full range of required support to forward-deployed Navy forces. A forward logistics site (FLS) locates closer to the operating forces than the ALSS. The capabilities of an FLS range from austere to nearly as capable as an ALSS. The FLSs normally include both a seaport and airport, but they may retain only one depending on the support requirement. Site availability may also become a limiting factor.

A-5. Special Operations Force Component

The Theater Special Operations Command (TSOC) J-4 or subordinate joint special operations task force J-4 normally coordinates common-user lift requirements to support SOF. The TSOC J-4 establishes a system to validate common-user lift requests from SOF units. The nature of the system depends on the composition and mission of the assigned forces. The TSOC J-4 also establishes communication links with the JDDOC and the AOC or JAOC. The special operations liaison element normally operates locates at the JAOC or AOC and assists in coordinating SOF requirements. Although the special operations liaison element works for the SOF commander, it can assist and expedite requests for common-user lift support to SOF units.

Appendix B: Movement Control Planning Factors

B-1. Types and Methods of Hauling

Joint MT operations use specific hauling methods to best accomplish mission requirements. The Marine Corps does not generally use these terms. It is important for planners to understand U.S. Army and joint doctrinal terminology so the MAGTF can integrate into the joint environment or control joint operations as a JTF. MT operations are categorized as intrazonal and interzonal. Within each category, one can define types as local, line haul, or zonal. Refer to ATP 4-11 for more information.

- **Intrazonal and Interzonal Operation.** Boundaries are defined between MSCs and elements, including battalions, regiments/brigades, divisions, corps, and theater armies. These boundaries also correspond to movement control boundaries. Intrazonal operations occur within an MSE/C's area of operation. Interzonal operations occur between MSE/C's boundaries and operate under the area control of multiple headquarters.

- **Types of Hauls.** There are three different types of hauls categorized by time and distance. Local hauls are less time consuming, relatively short distances, and can occur multiple times a day while line hauls take longer and cover greater distances. Zonal hauls have extended timelines that are even longer, or they must cover longer distances, typically requiring an operating shift or more to accomplish.

1. **Local.** Local hauls are operations where vehicles can make two or more round trips per day based on distance and transit time. Local hauls experience short running times compared to loading and unloading. A local haul usually occurs as an intrazonal movement within the unit's AO. Vehicles typically used for local hauls include organic transportation assets or assets assigned to support a unit.

2. **Line.** Line hauls are operations where vehicles cannot make more than one round trip per day due to distance, terrain restrictions, or transit time. Line hauls experience long run times compared to loading and unloading and usually involve one trip or a portion of a trip per operating shift. Line hauls more frequently involve interzonal trips commonly crossing movement control boundaries and may require additional coordination and support when transiting operational boundaries. Throughput operations from ports or theater storage areas to combat service support areas are usually considered line haul operations. Vehicle types typically used for line hauls include medium and heavy lift transportation assets in general support of the force or performing theater sustainment operations.

3. **Zonal.** Zonal (extended) hauls are operations where vehicles cannot make a portion of a trip in a day and must break trips into legs due to distance traveled, terrain restrictions, tonnage, or transit time. Zonal hauls commonly cross boundaries into other areas of operations/influence that could require joint coordination and support for completion.

- **Hauling Methods.** Hauling means the movement of a load by transportation assets. Four general methods to move cargo and personnel are:

1. **Direct Haul.** A direct haul concerns a single transport mission completed by the same vehicle(s). It does not involve a transfer of supplies or exchange of equipment as do hub and spoke. Direct hauls can be used in local or line haul operations.

2. **Shuttle.** A shuttle is a single transport mission completed in repeated trips by the same vehicles between two points. These are commonly referred to as local hauls.

3. **Relay.** A relay is a single transport mission completed in one trip that uses multiple vehicles without transferring the load. It involves the continuous movement of supplies or troops over successive segments of a route. Transporters accomplish this by changing drivers, powered vehicles (tractors), or both for each segment. Containerized or cargo on flat racks increases the effectiveness of this system and better uses the tonnage capabilities of certain vehicle platforms. In addition to rapid throughput of cargo, the relay system fosters command supervision and supporting services in each segment of the route. A relay distribution system will preposition drivers or vehicles at transfer points minimizing stationary time for loads.

4. **Hub and Spoke.** The hub and spoke method, used in local and line haul operations, uses a physical distribution system developed and modeled on industry standards to provide cargo management for a theater. This method increases transportation efficiencies and ITV. The hub and spoke method involves moving supplies or troops through a terminal (hub) and between segments of multiple routes (spokes) by changing drivers, powered vehicles (tractors), and/or loads at the hub. A hub means an organization that sorts and distributes inbound cargo from multiple supply sources. Hub terminal examples include a distribution center, trailer transfer point, centralized receiving and shipping point, logistics support area, or brigade support area. A spoke refers to a portion of the distribution system where a transportation mode operator delivers to a receiving unit.

B-2. Distance, Rate, and Time

Distance, rate, and time are used to perform a wide range of calculations for planning route movements. Staffs use these factors to conduct detailed and expedient planning and to develop movement tables and calculations to manage movement requests, see Figure B-1. The MMCC should generate road movement tables for large movements within the MAGTF AO. Refer to ATP 4-16 for an example of a road movement table.

▪ **Distance.** Expressed in kilometers or miles. The following terms are used to describe distance:

1. **Length.** The length of any column or element of a column is the length of a roadway that the column occupies. It is measured from the front bumper of the lead vehicle to the rear bumper of the trail vehicle and include all gaps inside the column.

2. **Road Space.** Road space means the length of a column plus any space (safety factor) added to the length to prevent conflict with preceding or succeeding traffic.

3. **Gap.** Gap means the space between vehicles, march units, serials, and columns. Measure gap from the trail vehicle of one element to the lead vehicle of the following element. Normally express the gap between vehicles in meters. Normally express the gap between march elements in miles.

4. **Lead.** Lead means the linear spacing between the heads of elements in a convoy or between heads of successive vehicles, march units, serials, or columns.

5. **Road Distance.** Road distance means the distance from point to point on a route, normally expressed in miles.

6. **Road Clearance Distance.** Road clearance distance means the distance that 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.

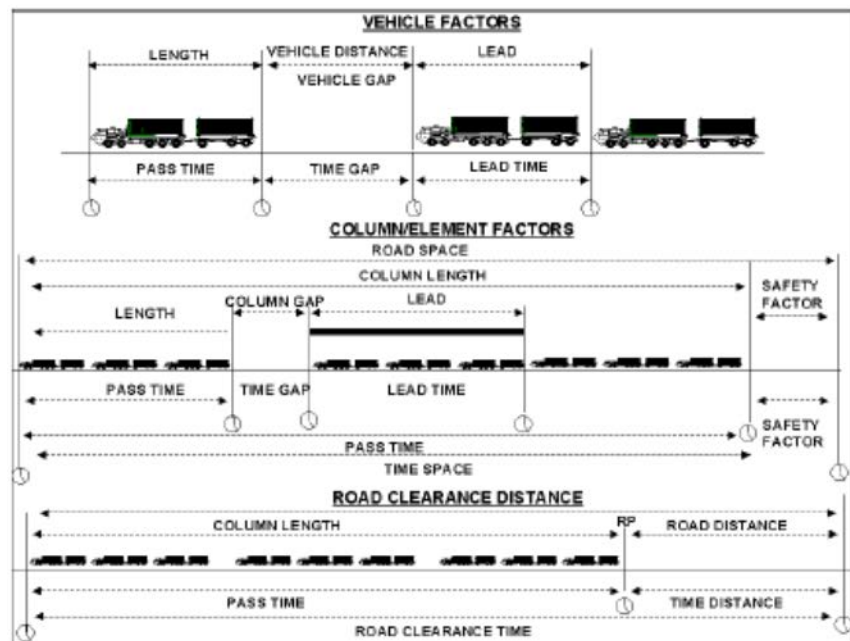


Figure B-1. Time and Distance Factors

- **Rate.** Although speed, pace, or rate of march can be used, movement planners normally prescribe a rate of march. Rate describes how long it takes to move a given distance. Express rate as follows:

1. **Speed.** Speed means the actual rate at which a vehicle moves at a given time as shown on the speedometer. Express speed in kilometers per hour (KPH) or miles per hour (MPH).
2. **Pace.** Pace means the regulated speed of a convoy or an element expressed in KPH or MPH as set by a lead vehicle, the pacesetter. Constantly adjust pace to suit road, terrain, and weather conditions.
3. **Rate of March.** Rate of march, expressed in KPH or MPH refers to the average number of kilometers or miles traveled in a specific time period. It includes short periodic halts and short delays but does not include long halts such as those for eating meals or for overnight stops.

- **Time.** Express time in hours or minutes. Use the following terms to describe time factors:

1. **Pass Time.** Pass time (or time length) refers to the time required for a column or its elements to pass a given point on a route.
2. **Time Space.** Time space refers to 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.

3. **Time Gap.** Time gap refers to the time measured between vehicles, march units, serials, or columns as they pass a given point. Measure time gap from the trail vehicle of one element to the lead vehicle of the following element.
4. **Time Lead.** Time lead means the time measured between individual vehicles or elements of a column, measured from head to head as they pass a given point.
5. **Time Distance.** Time distance means the time required to move from one point to another at a given rate of march. It means the time required for the head of a column or any single vehicle of a column to move from point to another at a given rate of march.
6. **Road Clearance Time.** Road clearance time refers to the total time required for a column or one of its elements to travel the road distance and clear a point along the route or the RP. Road clearance time equals the column's pass time or time space plus time distance.

7. **B-3. Distance, Rate, and Time Calculations**

Use distance (D), rate (R), and time (T) factors to make scheduling calculations for columns of any size. Determine these factors using the following formulas:

1. **Distance equals rate multiplied by time.** If R = 40 MPH and T = 4 hours then D = 160 miles.

$$40 \times 4 = 160 \text{ miles}$$

2. **Rate equals distance divided by time.** If a convoy travels for 5 hours (T) to complete a 190 mile (D) trip then its R = 38 MPH.

$$190/5 = 38 \text{ MPH}$$

3. **Time equals distance divided by rate.** If D = 210 miles and R = 42 MPH then T = 5 hours.

$$210/42 = 5 \text{ hours}$$

- **Finding an Unknown Factor of Distance, Rate, or Time.** Staffs can use an easy method to remember the proper formula for determining the unknown factor by using the triangle as shown in Figure B-2. To find an unknown factor, cover it and the uncovered portion of the triangle results in the formula for finding the unknown. For example, if Distance is unknown, cover it and RT (rate x time) remains. If rate is unknown, covering rate leaves distance/time. If time is unknown, covering T leaves distance/rate.

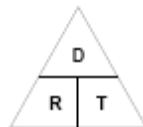


Figure B-2. Time/Distance/Rate Formula Aid

- **Arrive and Clear Time Calculations.** Arrive and clear times are not the same as time factors. The time factors measure a quantity of time or distance. Arrive and clear times represent actual time as displayed on a clock. The arrive time is the time the first vehicle in the column will arrive at a start point, CP, or RP. It derives from the time distance. The clear time means the time the last vehicle in the column will clear that start point, CP, or RP.

- **Arrive and Clear Time Calculations.** Arrive and clear times are not the same as time factors. The time factors measure a quantity of time or distance. Arrive and clear times represent actual time as displayed on a clock. The arrive time is the time the first vehicle in the column will arrive at a start point, CP, or RP. It derives from the time distance. The clear time means the time the last vehicle in the column will clear that start point, CP, or RP.

- **Calculating Arrive Times.** The arrive time at the start point is the same as the start point time. To calculate the arrive time at the first CP, take the distance from the start point to the first CP, divide by the planned rate of march, and multiply by 60 (minutes). Add this time to the arrive time at the start point to determine the arrive time at the first CP.

Example: Distance from start point to first CP: 10 miles March rate = 50 MPH

Solution: $10/50 = .20$ hours $\times 60 = 12$ minutes

If the arrive time at the start point was 0800, then the arrive time at the first CP would be 0812.

To calculate the arrive time at the second CP, take the distance from the first CP to the second CP, divide by the rate of march, and multiply by 60. Add the amount of time to the arrive time at the first CP to determine the arrive time at the second CP.

Example: Distance from first to second CP: 15 miles

March rate = 50 MPH

Solution: $15/50 = .30$ hours $\times 60 = 18$ minutes

If the arrive time at the first CP was 0812, then the arrive time at the second CP would be 0830. Continue this method to calculate the arrive time at succeeding CPs through the RP.

- **Calculating Clear Times.** To calculate the clear times at each CP, the planner must determine the pass time. Calculating pass time requires four calculations: density, time gaps, road space, and pass time. These four calculations are determined using the following formulas:

1. **Density** = $1,000/\text{Vehicle gap} + \text{average length of vehicle}$

Note: Express vehicle gap in meters. Express the average length of a vehicle in meters, representing the average length of the most common vehicle in the column.

Example: If the vehicle gap = 100 meters and the average vehicle length = 18 meters, then—

Density = $1,000/100+18 = 1,000/118 = 8.5$ vehicles per mile

2. **Time gaps** = $[(\text{number of march units} - 1) \times (\text{march unit time gap})] + [(\text{number of serials} - 1) \times (\text{serial time gap} - \text{march unit time gap})]$.

Example: If a column consists of two serials with two march units each and the gap between march units = 5 minutes and the gap between serials = 10 minutes, then:

Time gaps $[(4 - 1) \times 5] + [(2 - 1) \times 5] = [3 \times 5] + [1 \times 5] = 15 + 5 = 20$ minutes

3. **Road space** = number of vehicles/density + time gaps times rate/60 (minutes)

Example: number of vehicles = 87

Density = 8.5 per mi

Rate = 50 MPH

Time gaps = 20

Road space = $87 / 8.5 + [(20 \times 50) / 60] = 10.2 + 16.8 = 26.9$ mi

4. **Pass time** = roadspace x 60 / rate

Example: Continuation from above.

Pass time = $26.9 \times 60 / 50 = 1,614 / 50 = 32.2$ or 33 minutes

In this example, the clear time at the start point occurs 33 minutes after the first vehicle crossed the start point. If the arrival time at the Start Point is 0800 the clear time at the start point will be 0833. If the arrival time at the first CP is 0812, the clear time at the first CP will be 0845. Use this same method to calculate the arrive and clear times at succeeding CPs to the RP. This movement can be depicted as:

CP	Arrive Time	Clear Time
1	0800	0833
2	0812	0845
3	0830	0903

Table B-1. Example clear and arrive times 1

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.

▪ **Calculating Rest Halts.** The march rate compensates for short halts but does not include scheduled rest halts. Plan scheduled rest halts during the movement planning process. When planning rest halts, allow time to get vehicles off the road and staged, time to rest, and time to get vehicles back on the road. If you need 10 minutes for a rest halt, then schedule 15 minutes for the halt to ensure time to get vehicles on and off the road.

If a rest halt is scheduled at a CP, the arrive time at the CP stays the same. Only the clear time changes at that CP and the arrive and clear times at succeeding CPs. Adjust the clear time by the scheduled halt time. If a rest halt is scheduled between CPs, adjust both the arrive and clear times at the next CP by the scheduled halt time. Continuing, with the previous example, if you plan a 15-minute rest halt between CP 2 and CP 3, you must adjust the times as follows:

CP	Arrive Time	Clear Time
1	0800	0833
2	0812	0845
3	0845	0918

Table B-2. Example clear and arrive times 2

Note the 15-minute delay in arriving and clearing CP 3. If the rest halt is planned at CP 2, the adjustments become as follows:

CP	Arrive Time	Clear Time
1	0800	0833
2	0812	0900
3	0845	0918

Table B-3. Example clear and arrive times 3

Note the 15-minute delay in clearing CP 2, arriving at CP 3, and clearing CP 3.

The pass time will stay the same throughout the route as long as the march rate and density remain consistent. If the march rate or density changes, recalculate the pass time to determine the new clear time. Follow these guidelines to simplify calculations:

- Prepare and use conversion tables for changing U.S. common distances to metric distances, number of vehicles to time length, and distance to time.
- Standardize variables to reduce calculation time. When possible, the MMCC should publish standard march rates and convoy density for planning.

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Appendix C: Route Synchronization Plan

Route synchronization means the planning, routing, and scheduling of movement on ground supply routes and represents a control measure that regulates the flow of movement supporting military operations. Commanders with the responsibility to provide order, prevent congestion, and enforce movement priorities for the ground supply routes in their operational area execute route synchronization. The route synchronization plan informs all units operating within the MAGTF AO of the policies and procedures governing convoy or oversize/overweight vehicle movements. The designated staff should develop a route synchronization plan for all OPLANs or exercises for inclusion in Appendix 4 (Mobility and Transportation), Annex D (Logistics) of the applicable OPLAN or exercise directive.

The MAGTF G-3 should task the appropriate AO commander and the LCE with the appropriate route synchronization tasks in developing the route synchronization plan. Responsible organizations include the MDDOC, MMCC, MSC/E UMCCs, MAGTF Engineer, and MAGTF G-2/S-2.

The MDO with transportation planners must ensure the MAGTF policies and procedures comply with any theater transportation requirements. Whenever two or more regulating agencies (e.g. U.S. Army ESC and MCB) operate in the same theater of operation, staffs must standardize policies and procedures on movement priority codes, route classifications, and assessments. The output of this effort results in a fully integrated Traffic Circulation Plan that enhances theater distribution and avoids confusion (e.g. theater's MSRs share one name throughout the theater). See Appendix D for a traffic control point (TCP) example. The following page displays a sample format of the route synchronization plan.

CLASSIFICATION

Copy no. ____ of ____ copies
Official Designation of Command
Place of Issue
Date/time group
Message reference number

TAB D TO APPENDIX 4 TO ANNEX D TO OPERATION ORDER OR PLAN (Number) (Operation CODEWORD) () ROUTE SYNCHRONIZATION PLAN ()

- () REFERENCES: a. Relevant plans or orders.
 b. Required maps and charts.

1. () Situation. Include information affecting movement.

2. () Mission. Include provisions of effective route synchronization, reporting, support of operations, and coordination of movement and maneuver. Identify organizations responsible for controlling 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 TCP pertaining to theater route network.
 - (2) () Units perform route clearance and disseminate information on trend analysis and enemy TTPs.
 - (3) () Units responsible for abiding by all policies and procedures listed in the plan.
- c. () Coordinating Instructions. Address coordination on the use of MSRs, to include which information system (i.e., TCPT) will be used.

(1) () Request Procedures

- (a) () Convoy request form or oversize/overweight request form. Put example(s) as a tab to the appendix. Identify required data (mandatory). Hazardous cargo and oversize/overweight information must be put in remarks. Round trip, use request form with stopover time.
- (b) () Submit to: Identify commands units will submit convoy movement requests or oversize/overweight. Telephone procedures/telephone numbers, facsimile, etc.
- (c) () Submit when: How many days before movement, 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 request for movement form.

(2) () Route Utilization Information. Discuss MSRs listed in TCP. Explain controlled versus open MSRs.

- (a) () MSRs listed on TCP are open routes, 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 TCP (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 route(s), rules and procedures.
- (d) () Prohibited route. Identify which route(s) in the TCP or not shown in the TCP are prohibited.
- (e) () Reserved route (identify who can use and duration).

d. () Procedures

- (1) () Planning Factors (convoy). Use the following planning factors for convoys.
 - (a) () Distance between vehicles.
 - (b) () Time gap between march units/serials.
 - (c) () Time gap between convoys.
 - (d) () Oversize/overweight criteria. Procedures to submit request for clearance.
 - (e) () Vehicles per march unit.
 - (f) () March units per serial.
 - (g) () Headlight restrictions/Blackout procedures
 - (h) () Hardening of vehicles.
 - (i) () Signal/pyrotechnic requirements
 - (j) () Convoy/hazardous cargo marking/flags.
 - (k) () Delay in meeting start point time procedures.
 - (l) () Security requirements (e.g. quantity/type weapon system, number of security vehicles per convoy)

- (2) () Planning Factors (route information). Refer to Appendix D, Figure D-1, TCP, for location and type routes, halt locations and services, TCP locations, critical point locations, and restrictions.

- e. () Enforcement. Include command actions that will be taken in the event units do not follow policies and procedures. Stress the requirement that units must have approved march table/movement order prior to using controlled routes. Identify who will monitor and control movements.

4. () Administration and Logistics. Address any movement-related administrative or logistic requirements.

- a. () Provide logistical support request procedures: rest, refueling, and so forth. Identify convoy halt locations, facilities, and services available to include units responsible for providing services.
- b. () Maintenance and recovery procedures. Vehicle breakdown procedures.
- c. () Medical evacuation procedures.
- d. () Halts.

5. () Command and Control

- a. () Command. Identify communications reporting locations, frequency, and procedures with MMCC, MCTs, DLCs, TCPs, and BSOs.
- b. () Signal. Describe reporting requirements, method of communication, and radio frequencies.
 - (a) Transverse Chat or J-Chat
 - (b) Satellite phone

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Appendix D: Traffic Circulation Pla

The Traffic Circulation Plan consists of an overlay within Appendix 4, Mobility and Transportation, of Annex D, Logistics. The overlay accompanies the written description of control measures, MSRs, special considerations concerning road conditions, identification of supporting units, and any special instructions such as casualty evacuation from the route synchronization plan.

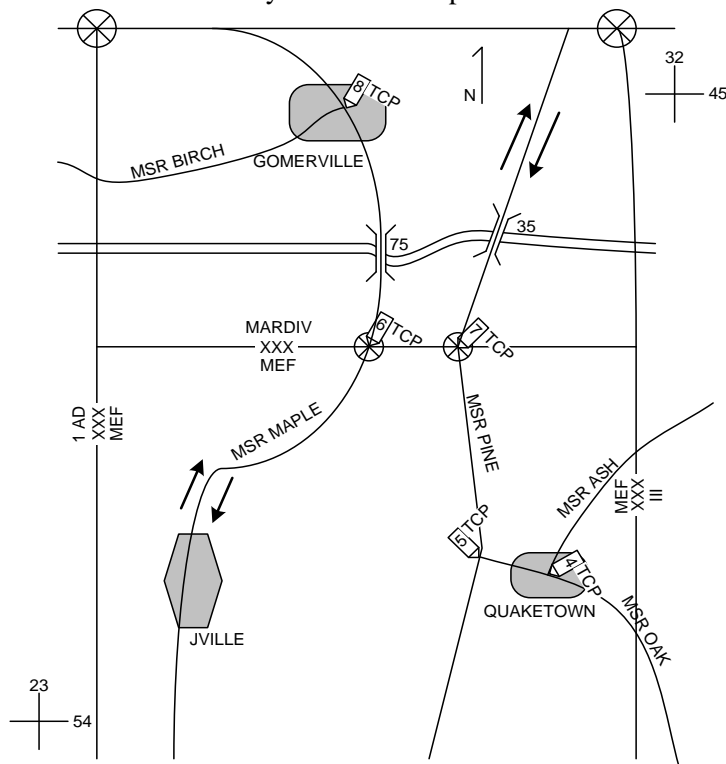


Figure D-1. Sample traffic circulation overlay

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Appendix E: Movement Control Board 7-minute Drill

1. Purpose. The Movement Control Board provides a forum for deconflicting and disseminating the approved convoy movements within the MAGTF's AO.
2. Objective. (e.g. To synchronize route clearance, route maintenance, and ground convoy movements to achieve frequent periodicity of USMC presence throughout the AO to increase force protection on MSRs.)
3. Board Composition:
 - a. Co-Chairpersons. MDO and G-3/S-3 Current Operations Officer
 - b. Membership:
 - (1) MMCC
 - (2) GCE UMCC
 - (3) CE UMCC
 - (4) ACE UMCC
 - (5) LCE UMCC
 - (6) AO Commander (can be represented by respective UMCC)
 - (7) MMDC
 - (8) MAGTF Engineer
 - (9) MAGTF Air Officer
 - (10) MAGTF G-2/S-2
 - (11) Adjacent Commands
 - (12) Supporting Command(s) (e.g. USA Support Battalions)
 - c. Secretary: MMCC Clerk
4. Responsibilities. Optimize assault support utilization, finalize all ground movements on MSRs in time and space, and disseminate information pertaining to joint logistics providers (e.g. USAF air delivery and USA Combat Sustainment Support Battalion)
5. Inputs:
 - a. Projected Enemy/Environment impacts to surface movements and recent enemy tactics, techniques, and procedures. (G-2/S-2)

- b. Current and projected operations to impact surface movements (MAGTF G-3/S-3 and MSC UMCCs)
 - Route Clearance Platoon operations for the next 24-96 hours (if applicable via joint forces for mounted route clearance capabilities).
- c. (MAGTF Engineer)
- d. Route Maintenance operations for the next 24-96 hours (MAGTF Engineer)
- e. Pre-planned ASRs for the next 24-96 hours (MAGTF AirO)
- f. USMC HST/Air Delivery operations (LCE G-3)
- g. U.S. Air Force Air Delivery operations (LCE G-3)
- h. Current Route Assessment (LCE G-2) from Route Assessment WG (if applicable)
- i. GTRs and TMRs for the last 24hrs and next 96 hours (MMCC)
- 6. Outputs:
 - a. GTO
 - b. Priority of pre-planned assault support to the MAW
- 7. Frequency. (e.g. Daily at 1530)
- 8. Location. (e.g. MAGTF G-4/S-4 Conference Room)
- 9. Resource Requirements:
 - a. TCPT
 - b. Adobe Connect on (network classification)
 - c. MAGTF G-4/S-4 SharePoint Portal on (network classification)
 - d. Theater JMC information portal (as required)

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Appendix G: Glossary

Section I - Acronyms

Note: Acronyms change over time in response to new operational concepts, capabilities, doctrinal changes and other similar developments. The following publications represent the sole authoritative sources for official military acronyms:

1. *DOD Dictionary of Military and Associated Terms*, Jun 2020
2. Marine Corps Reference Publication (MCRP) 1-10.2, *Marine Corps Supplement to the Department of Defense Dictionary of Military and Associated Terms*.
3. Joint Publication 3-0, *Joint Operations*
4. MCO 4470.1B, 20 Dec 2019
5. MCO 5231.3, 7 Apr 2009
6. Marine Corps Bulletin 4081, 22 May 2012

A/DACG	arrival/departure airfield control group
AE	aeromedical evacuation
AIS	automated information system
AIT	automated identification technology
ALSS	advanced logistics support site (USN)
AMC	Air Mobility Command
AO	area of operations
AOR	area of responsibility
AOC	air operations center
APOD	aerial port of debarkation
APOE	aerial port of embarkation
ASR	alternate supply route
ATP	Army Technique Publication
C2	command and control
CE.....	command element
CHE	container-handling equipment
CLB	combat logistics battalion
CLC2S	Common Logistics Command and Control System
COC	combat operations center
COMAFFOR	Commander Air Force Forces
CP	checkpoint
CS.....	combat support
CSS.....	combat service support
CTP.....	common tactical picture
DCI&L	Deputy Commandant, Installations and Logistics
DDOC	deployment and distribution operations center
DIRMOBFOR	Director of Mobility Forces
DLA	Defense Logistics Agency
DOD	Department of Defense
ESC.....	expeditionary sustainment command (USA)

OIC officer in charge
 OPCONoperational control
 OPLANoperation plan

 PNAphysical network analysis

 RP release point

 SDDC Military Surface Deployment and Distribution Command
 SMO Strategic Mobility Officer
 SOF..... Special Operations Forces

 TACCTanker Airlift Control Center (USAF)
 TACONTactical Control
 TCP.....traffic control point
 TCPT Transportation Capacity Planning Tool
 TMR transportation movement request
 TOO..... terminal operations organizations
 TSC.....theater sustainment command (USA)
 TSOC.....Theater Special Operations Command

 UMCCunit movement control center
 U.S. TRANSCOM United States Transportation Command

 WG working group

Section II - Definitions

Note: Definitions of military terms change over time in response to new operational concepts, capabilities, doctrinal changes and other similar developments. The following publications were used the authoritative sources for official military definitions of military terms:

1. *Department of Defense Dictionary of Military and Associated Terms.*
2. MCRP 1-10.2, *Marine Corps Supplement to the Department of Defense Dictionary of Military and Associated Terms.*
3. Marine Corps Order 4470.1B dtd 20 Dec 2019

A

air clearance authority—Service activity which controls movement of cargo (including personal property) into the airlift system under provisions of Department of Defense (DOD) 4500.9-R, Defense Transportation Regulation (DTR), Part II, Cargo Movement. (DTR, Part II)

Air Mobility Command—the Air Force component command of the United States Transportation Command. Also called AMC. (JP 3-17)

air tasking order—A method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities and/or forces to targets and specific missions. Also called ATO. (JP 3-30)

allocation 1. Distribution of limited forces and resources for employment among competing requirements. 2. The temporary transfer of forces to meet the operational demand of combatant commanders, including rotational requirements and requests for capabilities or forces (unit or individual) in response to crisis or emergent contingencies. See also **apportionment**. (JP 5-0)

alternate supply route—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**. (MCTP 3-40B)

area of operations—An operational area defined by a commander for land and maritime forces that should be large enough to accomplish their missions and protect their forces. Also called AO. See also area of responsibility; joint operations area; joint special operations area. (JP 3-0)

area of responsibility—The geographical area associated with a combatant command within which a geographic combatant commander has authority to plan and conduct operations. Also called AOR. See also combatant command. (JP 1)

B

battlespace – The environment, factors, and conditions that must be understood to successfully apply combat power, protect the force, or complete the mission. This includes the air, land, sea, space, and the included enemy and friendly forces; facilities; weather; terrain; the electromagnetic spectrum; and the information environment within the operational areas, areas of interest, and areas of influence. (MCRP 1-10.2)

C

checkpoint - 1. A predetermined point on the surface of the Earth used as a means of controlling movement, a registration target for fire adjustment, or reference for location. 2. A place where military police check vehicular or pedestrian traffic in order to enforce circulation control measures and other laws, orders, and regulations.

civil affairs—Designated Active Component and Reserve Component forces and units organized, trained, and equipped specifically to conduct civil affairs operations and to support civil-military operations. Also called CA. See also civil-military operations. (JP 3-57)

command and control—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Also called C2. (JP 1)

convoy—A group of vehicles organized for the purpose of control and orderly movement with or without escort protection that moves over the same route at the same time and under one commander. (JP 3-02.1)

D

Director of Mobility Forces—The designated agent for all air mobility issues in the area of responsibility or joint operations area, exercising coordinating authority between the air operations center (or appropriate theater command and control node), the 618 Air Operations Center (Tanker Airlift Control Center), and the joint deployment and distribution operation center or joint movement center, in order to expedite the resolution of air mobility issues. Also called DIRMOBFOR. See also air operations center; coordinating authority. (JP 3-17)

distribution—The operational process of synchronizing all elements of the logistic system to deliver the “right things” to the “right place” at the “right time” to support the geographic combatant commander. (JP 4-0)

G

Ground Transportation Order—Order published by the MDDOC that specifies ground movements by unit. Similar in function to ATO. (MCO 4470.1)

H

host nation—A nation which receives forces and/or supplies from allied nations and/or North Atlantic Treaty Organization to be located on, to operate in, or to transit through its territory. Also called HN. (JP 3-57)

J

Joint Deployment and Distribution Enterprise—The complex of equipment, procedures, doctrine, leaders, technical connectivity, information, shared knowledge, organizations, facilities, training, and materiel necessary to conduct joint distribution operations. Also called JDDE. (JP 4-0)

joint deployment and distribution operations center—A combatant command movement control organization designed to synchronize and optimize national and theater multimodal resources for deployment, distribution, and sustainment, also called JDDOC. (JP 4-09)

joint movement center—The center established to coordinate the employment of all means of transportation (including that provided by allies or host nations) to support the concept of operations. This coordination is accomplished through establishment of transportation policies within the assigned area of responsibility, consistent with relative urgency of need, port and terminal capabilities, transportation asset availability, and priorities set by a JFC.

joint operations area—An area of land, sea, and airspace, defined by a geographic combatant commander or subordinate unified commander, in which a JFC (normally a JTF commander) conducts military operations to accomplish a specific mission. Also called JOA. See also area of responsibility; joint special operations area. (JP 3-0)

joint reception, staging, onward movement, and integration—A phase of joint force projection occurring in the operational area during which arriving personnel, equipment, and materiel transition into forces capable of meeting operational requirements. Also called JRSOI. See also integration; joint force; reception; staging. (JP 3-35)

joint task force—A joint force that is constituted and so designated by the Secretary of Defense, a combatant commander, a subunified commander, or an existing joint task force commander. Also called JTF. (JP 1)

L

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)

logistics over-the-shore operations—The loading and unloading of ships without the benefit of deep draft-capable, fixed port facilities; or as a means of moving forces closer to tactical assembly areas dependent on threat force capabilities. Also called LOTS operations. See also joint logistics over-the-shore operations. (JP 4-01.6)

M

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 called MSR. (JP 4-01.5)

movement control—The planning, routing, scheduling, and control of personnel and cargo movements over lines of communications; includes maintaining in-transit visibility of forces and material through the deployment and/or redeployment process. See also line of communications; movement control teams; non-unit cargo; non-unit-related personnel. (JP 4-01.5)

O

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. See also combatant command; combatant command (command authority); tactical control. (JP 1)

operation plan—A complete and detailed plan containing a full description of the concept of operations, all annexes applicable to the plan, and a time-phased force and deployment list. Also called OPLAN. See also operation order. (JP 5-0)

R

release point (road)—A well-defined point on a route at which the elements composing a column return under the authority of their respective commanders, each one of these elements continuing its movement towards its own appropriate destination.

required delivery date—A date, relative to C-day, when a unit must arrive at its destination and complete offloading to properly support the concept of operations. Also called **RDD**.

route classification—Classification assigned to a route using factors of minimum width, worst route type, least bridge, raft or culvert military load classification and obstructions to traffic flow.

route synchronization—The planning, routing, and scheduling of movement on ground supply routes and is a control measure that regulates 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.

S

sustainment—The provision of logistics and personnel services required to maintain and prolong operations until successful mission accomplishment. (JP 3-0)

T

terminal operations—The reception, processing, and staging of passengers; the receipt, transit, storage, and marshalling of cargo; the loading and unloading of modes of transport conveyances; and the manifesting and forwarding of cargo and passengers to destination. See also operation; terminal. (JP 4-01.5)

throughput—In transportation, the average quantity of cargo and passengers that can pass through a port on a daily basis from arrival at the port to loading onto a ship or plane, or from the discharge from a ship or plane to the exit (clearance) from the port complex. (JP 4-01.5)

U

United States Transportation Command—The unified command with the mission to provide strategic air, land, and sea transportation for the Department of Defense, across the range of military operations. Also called **USTRANSCOM**.

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