ATP 4-11

ARMY MOTOR TRANSPORT OPERATIONS

MARCH 2026

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This publication supersedes ATP 4-11, dated 14 August 2020.

HEADQUARTERS, DEPARTMENT OF THE ARMY

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Army Techniques Publication
No. 4-11

Headquarters
Department of the Army
Washington, DC, 16 March 2026

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Preface

ATP 4-11 provides detailed information on Army motor transport operations. It discusses the principles and fundamentals of motor transport as well as the responsibilities of key personnel assigned to Army motor transport units.

The principal audience for ATP 4-11 is any member of the profession of arms. Commanders and staffs of Army headquarters serving as joint task force or multinational headquarters should also refer to applicable joint or multinational doctrine concerning the range of military operations and joint or multinational operations. Trainers and educators throughout the Army will also use this publication.

Commanders, staffs, and subordinates must ensure that their decisions and actions comply with applicable United States, international, and, in some cases, host-nation laws and regulations. Commanders at all levels will ensure that their Service members operate in accordance with the law of armed conflict and the rules of engagement. (See FM 6-27 for legal compliance.)

ATP 4-11 uses joint terms where applicable. Selected joint and Army terms and definitions appear in both the glossary and the text. Terms for which ATP 4-11 is the proponent publication (the authority) are italicized in the text and are marked with an asterisk (*) in the glossary. Terms and definitions for which ATP 4-11 is the proponent publication are boldfaced in the text. For other definitions shown in the text, the term is italicized, and the number of the proponent publication follows the definition.

The proponent of ATP 4-11 is the United States Army Transportation School. The preparing agency is the G3 Doctrine Division, United States Army Combined Arms Support Command. Send comments and recommendations on a DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) to Commander, United States Army Combined Arms Support Command, ATTN: ATCL-TDID (ATP 4-11), 2221 Adams Avenue, Building 5020, Fort Lee, VA 23801-1809 or submit an electronic DA Form 2028 by e-mail to usarmy.lee.tradoc.list.cascom-g3-5-7-tdid-doc@army.mil.

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Introduction

ATP 4-11 is the Army's doctrine for the use of motor transport in support of operations and is nested with FM 3-0 and FM 4-0. Army transportation operations are divided into four functions: mode operations, intermodal operations, movement control, and theater distribution. Army transportation executes movements using various conveyances (truck, lighterage, railcar, and aircraft) to transport cargo and personnel. For additional information, see FM 4-0.

Motor transport is the most flexible of all the surface and air modes of transport. Motor transport operations are broad in scope and are conducted in both intertheater and intratheater, from the strategic support area in the continental United States (CONUS) to the tactical assemble area or other operations in a theater. Motor transport fulfills movement requirements for activities that include tactical mobility, sustainment mobility, personnel replacements, and casualty evacuation. It serves as the link between the other modes as far forward as possible to enable freedom of action, extend operational reach, and prolong endurance. For detailed information on the modes of transport see ATP 4-13, ATP 4-14, ATP 4-15, ATP 4-16, ATP 4-91, ATP 4-92, ATP 4-93, and FM 4-0.

This publication discusses some near-term future capabilities for Army motor transport such as the M1300/M1302 enhanced heavy equipment transport system. The M1300/M1302 was designed to handle the 82-ton weight of the M1 Abrams tank and its crew. The M1300 deploys, transports, recovers and evacuates the heaviest M1A2 Abrams tank and other combat vehicles of similar weight to and from the battlefield. Appendix M provides information on other future systems.

ATP 4-11 contains three chapters and thirteen appendices:

Chapter 1 discusses the fundamentals of motor transport operations. It provides the reader with an overview of motor transport, the operational environment in which Army motor transport operations could occur, and the principles and tenets that guide Army motor transportation operations. It also discusses motor transport in support of operations.

Chapter 2 discusses the mission, composition, and description of truck companies at echelons above and below the brigade combat team level. Finally, this chapter provides information on the roles and responsibilities of personnel assigned to motor transport units.

Chapter 3 discusses motor transport planning and operations. It discusses command roles in transportation asset allocation, tactical operations that affect motor transport planning considerations, planning for motor truck transportation, motor truck in support of distribution operations, methods of distribution operations, accountability of transportation assets, and maintenance services as they relate to Army motor transport operations.

Appendix A describes Army sustainment organizations and the relationships with transportation units.

Appendix B describes procedures for the organization and operation of a truck company area.

Appendix C provides procedures for the supervision of preventive maintenance.

Appendix D provides procedures for operators and leaders to use to evaluate road networks.

Appendix E provides roles and responsibilities for unit training on vehicle loads and cargo loading.

Appendix F provides procedures for manual reports and control of motor transport equipment.

Appendix G describes procedures on convoy control and convoy operations.

Appendix H describes procedures for CONUS convoy military operations.

Appendix I describes the automation information systems used to provide asset visibility.

Appendix J provides vehicle weight scales for moving truck convoys over CONUS public highways.

Appendix K provides actions and procedures for transportation company survivability in large-scale combat operations.

Appendix L provides linear and liquid measure and weight equivalents of U.S. units to metric units and conversion factors for the most commonly used measurements and weights.

Appendix M provides a brief overview on the use of human and machine integrated vehicle technology.

Chapter 1

Fundamentals of Motor Transport

Army motor transport provides tactical and sustainment mobility in support of operations. Chapter 1 provides an overview of Army motor transport and the operational environment in which Army motor transport operations occur.

ARMY MOTOR TRANSPORT OPERATIONS

1-1. Surface and air are the two modes of Army transportation operations. The surface mode of transport includes motor, water, and rail. The air mode of transport consists of fixed-wing and rotary-wing aircraft. The focus of ATP 4-11 is motor transport operations. For detailed information on surface and air modes of transport and other transportation functions see ATP 4-12, ATP 4-13, ATP 4-14, ATP 4-15, ATP 4-16, and FM 4-0.

1-2. A ***motor transport operation*** **is a ground support function that includes moving and transferring units, personnel, equipment, and supplies by motor vehicle to support operations**. Motor transport units together with terminal operators and movement control units form the backbone of a combatant commander's transportation and distribution network capability. Army motor transport units are the largest provider of surface movement within joint forces and are often augmented by joint, host-nation, and contracted resources. Motor transport operations are an integral aspect of the Army's support to operations.

1-3. Army motor transport organizations move units, personnel, and cargo as far forward as possible to enable freedom of action, extend operational reach, and prolong endurance. During large-scale combat operations, motor transport units may require augmentation to support tactical and sustainment mobility. *Tactical mobility* is the ability of friendly forces to move and maneuver freely on the battlefield relative to the enemy (ADP 3-90). Sustainment mobility is the ability to support logistics, financial management, personnel services, and health service support operations. Motor transport operations provide essential distribution and lift capabilities for supporting sustainment mobility.

1-4. Army motor transport operations may be conducted anywhere in the world; therefore, motor transport units should remain rapidly deployable as they are the predominant surface mode of transport for movement to the port of embarkation in the continental United States (CONUS) and from the port of debarkation outside CONUS into an operational area. Transportation units must be highly trained and capable of operating in various environments.

OPERATIONAL ENVIRONMENT

1-5. The *operational environment* is the aggregate of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander (JP 3-0). To understand the environment in which operations may occur, motor transportation units analyze variables that include environmental factors, infrastructure, physical environment, enemy, and time relationships across air, land, maritime, space, and cyberspace domains.

1-6. Assessment of the operational environment involves analysis of the operation along with mission variables to determine infrastructure, environmental factors, and resources that can optimize or adversely affect motor transport operations. The mission variables are mission, enemy, terrain and weather, troops and support available, time available, and civil considerations, each of which have informational considerations. For example, Army motor transport units should provide drivers detailed, up-to-date information regarding the conditions of road networks, weather forecasts, and enemy disposition. Timely and relevant information regarding infrastructure, environmental conditions, and threats facilitates planning and the execution of effective motor transport operations.

1-7. To support joint campaigns, Army forces conduct operations in a strategic environment including large-scale combat operations, crisis response and limited contingency operations, and military engagement and security cooperation. Figure 1-1 on page 2 describes the strategic environment through the three contexts in

which Army forces conduct operations: competition below armed conflict, crisis, and armed conflict. More details on the Army strategic contexts are discussed in Chapter 3 of this ATP, FM 3-0, and FM 4-0.

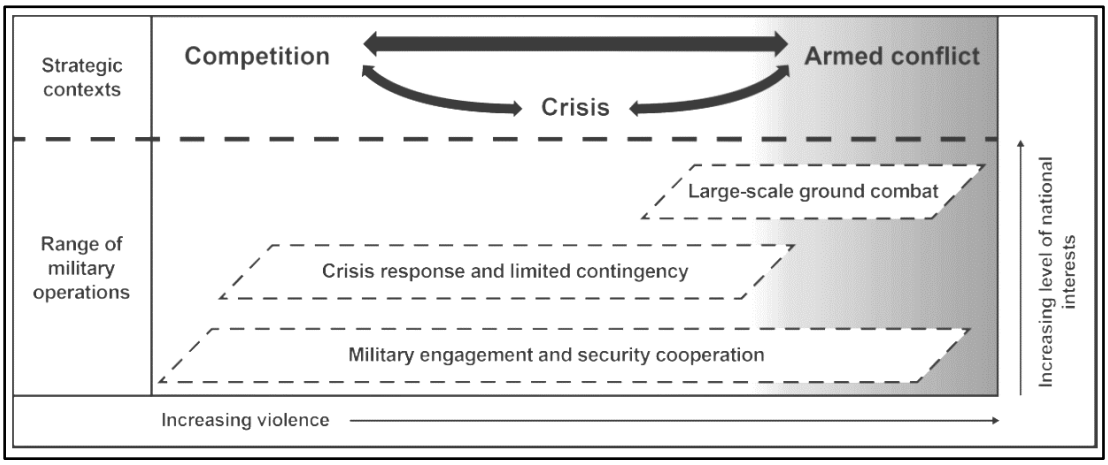


Figure 1-1. Army strategic contexts and operational categories

1-8. While most operations conducted by Army forces occur either below the threshold of armed conflict or during limited contingencies, the focus of Army readiness is on large-scale combat operations. The United States always retains the option to employ greater levels of force when less coercive methods are ineffective, and when a vital interest or national security is at stake. This requires Army forces to be prepared for the most demanding and dangerous types of operations. Army forces contribute to conventional deterrence through their demonstrated capability, capacity, and will to wage war on land in any environment against any opponent. Credible combat forces make the other instruments of national power more potent, and they help deter the enemy's escalation of violence during other types of operations.

Chapter 2

Motor Transport Units

Chapter 2 outlines the mission, composition, and description of truck companies at echelons above and below the brigade level. This chapter also details the duties and responsibilities of key leaders and personnel assigned to motor transport units.

ECHELONS ABOVE BRIGADE MOTOR TRANSPORT

2-1. Echelons above brigade (EAB) battalions provide logistics support to division and corps formations and enable units operating throughout the area of responsibility. Functional logistics battalions provide critical logistics capabilities in an operational area. The transportation motor transport battalion is an EAB functional battalion found either at the corps or theater level.

TRANSPORTATION MOTOR TRANSPORT BATTALION

2-2. The transportation motor transport battalion is assigned to a theater sustainment command (TSC), normally attached to a sustainment brigade. The battalion consists of an organic headquarters and headquarters detachment. The battalion deploys to a theater to provide command and control of three to seven motor transport companies, detachments, or teams. The actual task organization is mission dependent.

Transportation Motor Transport Battalion

- **Role:** Provides command and control of units conducting motor transport operations.
- **Capability:** One per three to seven subordinate transportation motor transport units in the theater.
- **Command relationship:** Normally attached to a sustainment brigade.
- **Support relationship:** General support.

2-3. Motor transport companies provide transportation for the movement of breakbulk cargo, containers, bulk water, petroleum products, preconfigured loads on flatracks, heavy lift combat systems, and personnel by ground. There are four basic types of motor transport companies: light-medium truck, medium truck, heavy truck, and composite truck.

LIGHT-MEDIUM TRUCK COMPANY

2-4. Light-medium truck companies provide transportation support for the movement of bulk cargo, containers, and personnel using the family of medium tactical vehicles (FMTV), which is comprised of the light-medium tactical vehicle (LMTV) and the medium tactical vehicle (MTV). FMTVs are based on a common chassis that vary by payload and mission requirements. The LMTV has a 2.5-ton capacity (cargo and van models), while the MTV has a 5-ton capacity (cargo and long-wheelbase cargo with and without materials handling equipment, tractor, van, wrecker, and dump truck models). The M1078 LMTV is a two-axle, four-wheel drive (4x4) vehicle designed to transport cargo and Soldiers. It has a payload capacity of 5,000 pounds and can be outfitted with materials handling equipment or a self-recovery winch kit. The M1083 MTV is a three-axle, six-wheel drive (6x6) vehicle also designed to transport cargo and Soldiers. An additional weight capacity of 10,000 pounds provides the capability for these vehicles to perform local and line-haul operations. They are rapidly deployable worldwide and operate on primary and secondary roads, trails, and cross-country terrain in all climates. Commonality of parts across varied truck chassis simplifies logistics requirements and significantly reduces operating and support costs. Figure 2-1 on page 4 depicts the organization of a light-medium truck company.

Light-Medium Truck Company

- **Role:** Provides transportation support for the movement of bulk cargo, containers, and personnel.
- **Capability:** 50 MTV cargo trucks with 25 trailers, 10 FMTV tractor trucks with 20 semitrailers.
- **Command relationship:** Normally attached to a motor transportation battalion, combat sustainment support battalion, or division sustainment support battalion.
- **Support relationship:** General support.

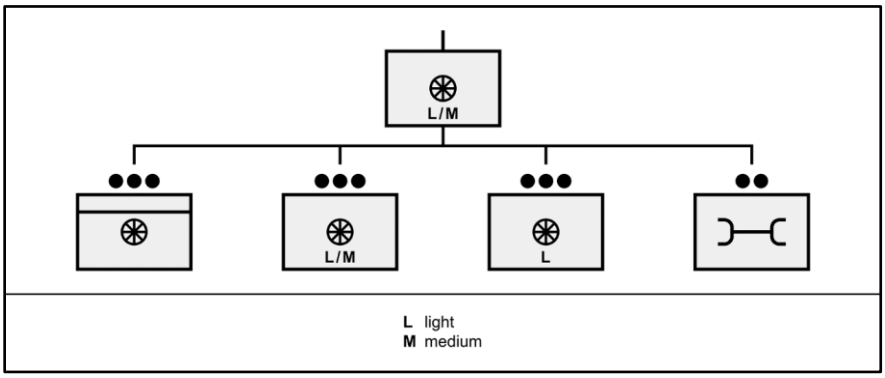


Figure 2-1. Light-medium truck company

2-5. The light-medium truck company has two FMTV truck variants, including the MTV cargo and the MTV tractor. The M1088 MTV tractor truck is designed on the same chassis as the M1083 MTV, but it is the prime mover for the M871 22.5T trailer. The M1088 can be equipped with a self-recovery winch. For every two FMTV cargo vehicles, there is one companion trailer assigned with the same cube and payload capacity as their prime movers. In addition, for every MTV tractor required, there are two M871 22.5T trailers required.

2-6. Assuming a 100% total vehicle availability rate (TVAR), the light-medium truck company can provide 50 FMTV cargo trucks with 25 trailers and 10 FMTV tractor trucks with semitrailer combinations. (See table 2-1)

Table 2-1. Light-medium truck company one time lift capability

Type	*100% Total Vehicle Availability Rate*
Breakbulk General Cargo	225 short tons
Breakbulk Ammunition	404 short tons
Pallets	440
463L Pallets	80
Containers, Twenty Foot	10
Containers, Forty Foot	0
Personnel with gear	600

MEDIUM TRUCK COMPANIES

2-7. There are five types of medium truck companies: the palletized load system (PLS) company, two general cargo (line haul and tactical) companies, and two petroleum, oil, and lubricants (POL) companies. The PLS company is comprised solely of PLS platforms. The general cargo company can be outfitted with the M915 series of line-haul tractors or the MTV tractor with associated trailers. The POL companies (9K and 5K) contain M915 series or MTV tractors with fuel trailers. Figure 2-2 depicts the organization of a medium truck company, and the following paragraphs provide descriptions of the different types of medium truck companies.

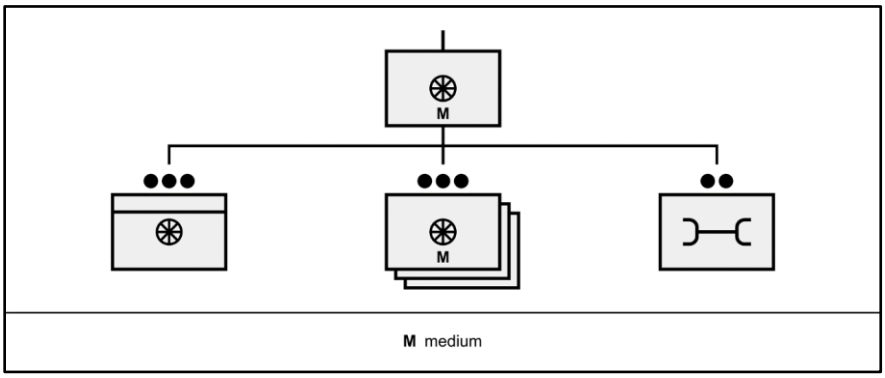


Figure 2-2. Transportation medium truck company (PLS) (EAB tactical)

Medium Truck Company (PLS) (EAB tactical)

2-8. The PLS truck company mission is to provide ground transportation for the movement of dry and refrigerated containerized cargo, other breakbulk cargo, ammunition, and bottled water on PLS flatracks. PLS trucks have a self-load and off-load capability with a container roll-in/roll-out platform (CROP), a central tire inflation system to enhance mobility, and are air transportable via C-5, C-130, and C-17 aircraft as well as deployable by rail and sea. The CROP is a NATO-interoperable platform that fits inside a single International Organization for Standardization container. The PLS is a tactical wheeled vehicle with a truck bed and a flatrack that has a 16 1/2 ton maximum weight capacity. It can pull a PLS trailer that also has a 16 1/2 ton weight capacity for a total carrying capacity of 33 tons. The PLS truck has a hydraulic lift system that loads and unloads both truck and trailer flatracks. A medium truck company (PLS) is authorized 60 trucks, 60 trailers, and 360 flatracks or CROPs. The PLS can be fitted with an enhanced container handling unit attachment to load and unload 20-foot containers without using flatracks. The enhanced container handling unit cannot be used to load a container on to the M1076 trailer on its own; a flatrack or container transfer enhancement must be used. When the PLS is equipped with tank racks or load handling system compatible water tank racks (called HIPPOs), it can transport bulk petroleum products or bulk water based on the type of tank loaded. The self-load/unload capability of PLS, coupled with variations of the flatrack configuration, makes the system well-suited for a number of potential missions. These missions include cargo and shelter transport, unit mobility and resupply, authorized stock listing mobility, recovery and evacuation, liquid cargo transport, and engineer bridge transport.

PLS Truck Company

- **Role:** Provides ground transportation for the movement of dry and refrigerated containerized cargo, other breakbulk cargo, ammunition, and bottled water on PLS flatracks.
- **Capability:** 60 PLS trucks, 60 PLS trailers.
- **Command relationship:** Normally attached to a motor transportation battalion, combat sustainment support battalion, or division sustainment support battalion.
- **Support relationship:** General support.

2-9. Assuming a 100% TVAR, the PLS truck company provides 60 vehicles and 60 trailers for mission operations, and when properly outfitted for the mission, has a one-time lift capability as indicated below in table 2-2 on page 6.

Table 2-2. Transportation medium truck company (PLS) (EAB tactical)

Type	*100% Total Vehicle Availability Rate*
Breakbulk General Cargo	421 short tons
Breakbulk Ammunition	757 short tons
Pallets	960
463 Pallets	240
Containers, Twenty Foot	120
Containers, Forty Foot	0
Bulk Water	240,000 gallons
Bulk Fuel	300,000 gallons

Medium Truck Company Cargo

2-10. The medium truck company cargo's mission is to provide transportation for the movement of containerized, non-containerized, or palletized dry and refrigerated cargo and bulk water. This company is employed in both local and line-haul operations, primarily in the theater area of responsibility, corps area of operations (AO), or division AO in direct support of the theater movement plan. There are two types of medium truck cargo companies, the 34T and the 22T. These companies are authorized 60 vehicles and 120 trailers.

Medium Truck Company Cargo (34T & 22T)

- **Role:** Provides transportation for the movement of containerized, non-containerized, or palletized dry and refrigerated cargo and bulk water.
- **Capability:** 60 M915 tractor trucks, 120 M872 semitrailers.
- **Command relationship:** Normally attached to a motor transportation battalion, combat sustainment support battalion, or division sustainment support battalion (tactical only).
- **Support relationship:** General support.

Medium Truck Company Cargo (34T)

2-11. The medium truck company cargo (line haul) (34T) is equipped with the M915 series tractor truck that tows the M872 40ft, 34T semitrailer. The M915 series tractor is generally utilized to support line-haul operations, including port clearance and intermodal operations, but can also support local hauls. The M915 series is a 6x4, rear-wheel drive, 14-ton semitractor with a 52,000-pound gross vehicle weight (GVW) rating and 105,000-pound combined GVW.

2-12. The M872 trailer is a platform-style, three-axle, dual-purpose semitrailer with a rated payload of 68,000 pounds. The 34T capacity can support 40 feet of containerized or non-containerized cargo, including two twenty-foot equivalent unit containers or one forty-foot equivalent unit container on its open deck. The trailer can be equipped with a 5K semitrailer-mounted fabric tank and can provide transportation capabilities for 4,750 gallons of bulk water. It may also be equipped with a HIPPO, which is a 2,000-gallon potable water tank with an integrated pump, engine, alternator, filling stand, and 70-foot hose reel with bulk suction and discharge hoses. The HIPPO is the same size as a one twenty-foot equivalent unit container; one M872 trailer can be equipped with two HIPPOs. A trailer mounted with a semitrailer-mounted fabric tank cannot haul any other commodity. The company is equipped with 60 M915s and 120 M872 trailers, but it can only provide lift capabilities for 60 trailers at one given time.

2-13. Assuming a 100% TVAR, the medium truck company cargo (34T) provides 60 vehicles/trailers for support and has a one-time lift capability as indicated in table 2-3.

Table 2-3. Medium truck company cargo (34T) one-time lift capability

Type	*100% Total Vehicle Availability Rate*
Breakbulk General	447 short tons
Break Ammunition	803 short tons
Pallets	1080
463L Pallets	240
Containers, Twenty Foot	120
Container, Forty Foot	60
Water (SMFT)	247,200 gallons
Water (HIPPO)	240,000 gallons
HIPPO load handling system compatible (2,000 gallons) water tank rack SMFT semitrailer mounted fabric tank	

Medium Truck Company Cargo (22T)

2-14. The medium truck company cargo (tactical) (22T) is equipped with the M1088 MTV tractor that tows the M871 30ft, 22.5T trailer. The M1088 MTV tractor truck is the same vehicle authorized in the light-medium truck company. The M871 trailer is similar to the M872 trailer but is shorter and has less payload capacity (45,000 pounds). The trailer can be equipped with the 3K semitrailer-mounted fabric tank that provides transportation capabilities for 3,000 gallons of bulk water. It can also be equipped with the HIPPO (2,000 gallons), which is equivalent to one twenty-foot equivalent unit, and still have remaining cargo space. The unit is equipped with 60 M1088 MTV tractors and 120 M871 trailers, but it can only provide lift capabilities for 60 trailers at one time.

2-15. Assuming a 100% TVAR, the medium truck company cargo (22T) provides 60 vehicles/trailers for mission operations and has a one-time lift capability as indicated in table 2-4 below.

Table 2-4. Medium truck company cargo (22T) one-time lift capability

Type	*100% Total Vehicle Availability Rate*
Break General Cargo	288 short tons
Breakbulk Ammunition	517 short tons
Pallets	840
463L Pallets	180
Containers, Twenty Foot	60
Containers, Forty Foot	0
Water (SMFT)	180,000 gallons
Water (HIPPO)	180,000 gallons
HIPPO load handling system compatible (2,000 gallons) water tank rack SMFT semitrailer mounted fabric tank	

Medium Truck Company POL

2-16. Planning and coordination for bulk fuel transport requirements is vital to the movement of bulk fuel. Army bulk petroleum is normally delivered at the class III support point in bulk fuel distribution systems and tactical fuel distribution systems. The following discusses the different variations of the medium truck company (POL).

Medium Truck Company POL (9k) Battlefield Fuel Distribution System

2-17. The medium truck company battlefield fuel distribution system provides the Army with motor transport (semitrailer) capability to move bulk fuel at EAB. Equipped with 60 M915 trucks and 60 9k tankers, a single company can transport 540,000 gallons of fuel per haul using 100% of its TVAR within an operational area. The unit is dependent upon improved road conditions and is typically employed in joint security area and corps AO. The unit is normally attached to a motor transport battalion, combat sustainment support battalion (CSSB), or a quartermaster petroleum support battalion.

Medium Truck Company POL (9k) Battlefield Fuel Distribution System

- **Role:** Provides transportation for the movement of bulk petroleum products.
- **Capability:** 60 M915 tractor trucks, 60 9k tankers.
- **Command relationship:** Normally attached to a motor transportation battalion, combat sustainment support battalion, or a quartermaster petroleum support battalion.
- **Support relationship:** General support.

Medium Truck Company POL (5K) Tactical Fuel Distribution System

2-18. The medium truck company POL tactical fuel distribution system provides transportation for the movement of bulk petroleum products using FMTV tractors with associated semitrailer tanks and the tactical fuel distribution system. This company is employed primarily in the corps or division AO and conducts local-haul operations. The company provides bulk and retail fuel distribution. This company is authorized 60 FMTV Tractors (M1088), and 60 5k tankers. A company can transport 300,000 gallons of fuel per haul using 100% of its TVAR in an operational area. The unit is normally attached to a quartermaster petroleum support battalion, CSSB, or a division sustainment support battalion (DSSB).

Medium Truck Company POL (5K) Tactical Distribution System

- **Role:** Provides transportation for the movement of bulk petroleum.
- **Capability:** 60 FMTV tractor trucks, 60 5k tankers.
- **Command relationship:** Normally attached to a quartermaster petroleum support battalion, combat sustainment support battalion, or division sustainment support battalion.
- **Support relationship:** General support.

HEAVY EQUIPMENT TRANSPORT COMPANY

2-19. The heavy equipment transport (HET) company can provide a one-time heavy lift of 96 tracked combat vehicles (one tracked vehicle per HET system). The mission of the HET company is port clearance, onward movement, and tactical displacement of heavy maneuver forces. The HET company also performs recovery and evacuation missions for equipment to higher levels for repair.

Heavy Equipment Transport Company

- **Role:** Provides transportation support for the movement of armored brigades, port clearance, and evacuation of equipment for repair.
- **Capability:** 96 HET systems: 32 enhanced HETS and 64 medium equipment trailers.
- **Command relationship:** Normally attached to a motor transportation battalion or combat sustainment support battalion.
- **Support relationship:** General support.

2-20. Management and visibility of HET systems (which consist of the M1070 truck tractor and the M1000 HET) are particularly critical when supporting a heavy force. These HET systems are currently being replaced by the enhanced heavy equipment transporter systems (commonly known as EHETs) M1300 truck tractor and the M1302 trailer. They are designed to transport payloads of up to 85 tons (primarily Abrams tanks). Maneuver commanders rely heavily on the capabilities the HET company brings to an operation, which includes transport, recovery, and evacuation of combat-loaded main battle tanks. Movement planning is essential because routes must be able to accommodate the weight and width of HETs. The organization of the HET company is shown in figure 2-3.

2-21. Select HET companies will also be equipped with medium equipment trailers to support armored brigades. These trailers will be designed to transport payloads of 60 tons or less (primarily medium tracked vehicles such as the Bradley, Paladin, and construction equipment).

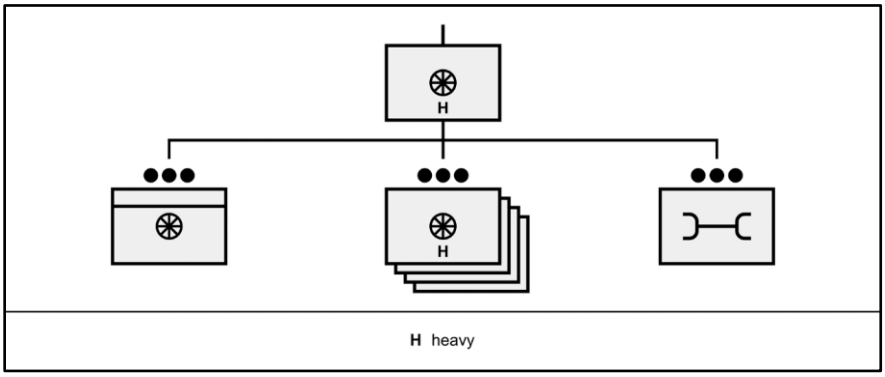


Figure 2-3. Heavy equipment transport company

COMPOSITE TRUCK COMPANIES

2-22. There are two types of composite truck companies (CTCs): the CTC (heavy) and the CTC (light). Each is designed to provide tailored support to division and corps elements. Each CTC is organized with a combination of MTV and PLS trucks. The CTC (heavy) has an additional complement of HET trucks and trailers.

Composite Truck Company (Heavy)

2-23. The CTC (heavy) is designed to support armored divisions. This company provides transportation and convoy security support to division sustainment brigade (DSB) operations for heavy divisions. It provides transportation assets for the movement and distribution of dry and refrigerated containerized cargo, general non-containerized cargo, ammunition, bottled water, and bulk water (when equipped with tank racks/HIPPOs). The CTC assists with unit moves and transports heavy equipment, tanks, and oversized loads. It may also provide security escort for contracted trucks. This company is normally employed in the division AO and is organic to a DSSB. It can conduct both line-haul and local-haul missions in all threat environments. The organization of a CTC (heavy) is shown in figure 2-4 on page 10.

Composite Truck Company (Heavy)

- **Role:** Performs transportation and convoy security support to division sustainment brigade operations. Provides transportation assets for the movement and distribution of dry and refrigerated containerized cargo, general non-containerized cargo, ammunition, and bottled and bulk water. Also assists with unit and personnel moves.
- **Capability:** 40 PLS trucks, 40 PLS trailers, 20 MTV trucks, 20 MTV trailers, 18 HET systems: 6 enhanced HETS and 12 medium equipment trailers, 20 mine-resistant ambush protected vehicles.
- **Command relationship:** Normally attached to a motor transportation battalion or CSSB. Organic to the DSSB.
- **Support relationship:** General support.

2-24. The CTC (heavy) has one MTV platoon, two PLS platoons, and one HET platoon to support armored brigades. The HET platoon will also have medium equipment trailers.

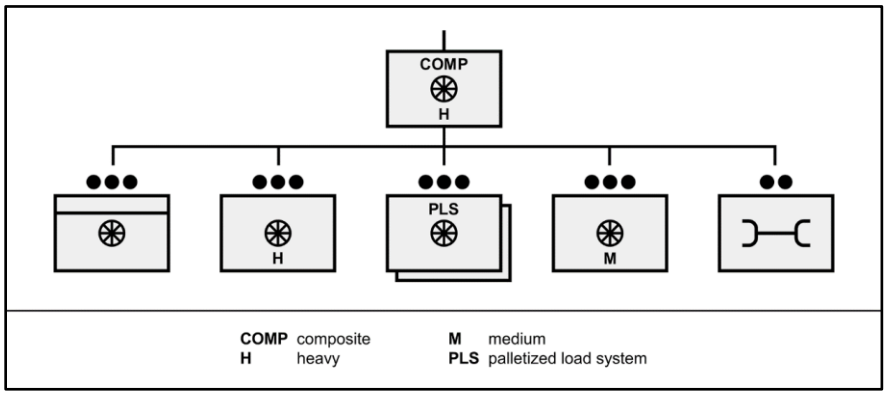


Figure 2-4. Composite truck company (heavy)

Composite Truck Company (Light)

2-25. The CTC (light) is designed to support light divisions. The CTC light performs transportation and convoy security support to DSB operations for a light division and is organic to the DSSB. The CTC (light) provides transportation assets for the movement and distribution of dry and refrigerated containerized cargo, general non-containerized cargo, ammunition, bottled water, and bulk water (when equipped with tank racks/HIPPOs). The CTC (light) also assists with unit moves, transports personnel, and provides security escort for contracted trucks. The organization of a CTC (light) is shown in figure 2-5.

Composite Truck Company (Light)

- **Role:** Same as the CTC heavy.
- **Capability:** 80 PLS trucks, 80 PLS trailers, 20 MTV trucks, 20 MTV trailers, 20 mine-resistant ambush protected vehicles.
- **Command relationship:** Normally attached to a motor transportation battalion or CSSB. Organic to the DSSB.
- **Support relationship:** General support.

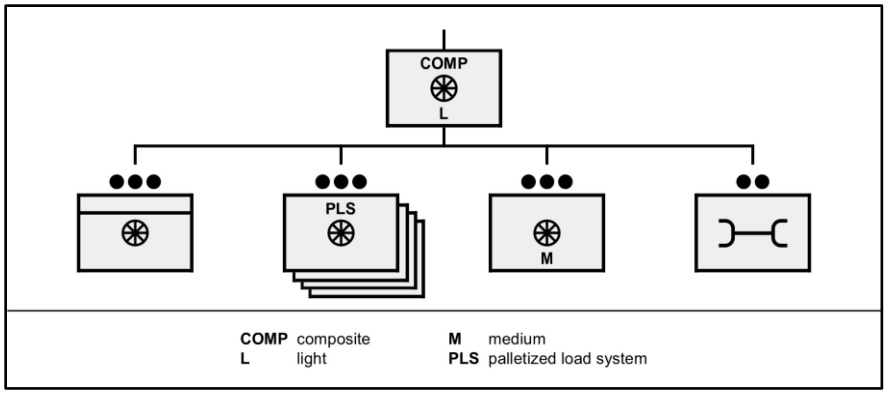


Figure 2-5. Composite truck company (light)

BRIGADE AND BELOW MOTOR TRANSPORT

2-26. Transportation requirements for maneuver brigades are primarily fulfilled by the brigade's organic brigade support battalion (BSB) and the light support battalion that is assigned to the DSB. BSBs provide a variety of capabilities and use assigned forward support company (FSC) distribution platoons to provide support to maneuver battalions. The light support battalion provides multi-functional logistics support to mobile brigades. Its core competencies are planning, synchronizing, and executing sustainment in support of brigade operations.

2-27. To meet brigade support requirements, logisticians utilize actionable data provided by automation systems. Logisticians are linked to decisive operations with near-real-time information allowing staff officers

and commanders the ability to plan, prepare, execute, and assess transportation operations. Numerous entities at the brigade and below level are involved in this process. For additional information on the BSB organization and sustainment support to brigades, see ATP 4-90.

BSB SUPPORT OPERATIONS TRANSPORTATION SECTION

2-28. Transportation support within maneuver brigades is accomplished through the BSB support operations (SPO) transportation section. All movement requests are submitted from the brigade or maneuver battalion S-4 to the BSB SPO transportation section. The SPO transportation officer verifies the requirements and asset availability and then sends the requirements to the BSB S-3, who then tasks the distribution company to support those requirements. Motor transport requirements which exceed the capability of the BSB are submitted to the DSB transportation branch for external support.

BSB DISTRIBUTION COMPANY

2-29. The mission of the distribution company is to provide transportation, supply, class III, and water support to the maneuver brigades. This unit is employed in the brigade support area (BSA) and operates as part of the BSB, with subordinate elements operating throughout the brigade area. BSB distribution companies have three platoons: a transportation platoon, a supply platoon, and a fuel and water platoon. This publication will only address the transportation platoon. While similarly structured, the composition of distribution companies differs depending on the type of brigade supported. For example, distribution companies supporting armored brigades have more fuelers, while those supporting Stryker brigades have more load handling systems (LHSs) for distribution. The distribution company receives supplies from the supporting DSB or DSSB with the capability to store these supplies and issue them to the FSCs and units within the BSA. See ATP 4-90 for additional information on the BSB distribution company.

2-30. The distribution company provides planning, direction, and supervision of supply distribution and transportation support to the brigade and conducts the daily receipt, temporary storage, and issue of supply classes I, II, III, IV, V, and IX. The distribution company also provides for the transportation of cargo and water distribution for the brigade, including the brigade's authorized stockage list.

2-31. The distribution company conducts operations using a variety of equipment. Based on the brigade the company supports, it can be equipped with PLS, variants of the heavy expanded mobility tactical truck (HEMTT), and FMTVs. The most typical variants of the HEMTTs prevalent in the distribution company are the M1120 HEMTT LHS and the M978 HEMTT fueler. The LHS is similar to the PLS, but differs in payload capabilities, as its maximum capacity is 11.5 tons. The LHS is also a four axle, eight-wheel drive vehicle (8x8) compared to the PLS (10x10). The LHS uses the same flatracks, CROPs, enhanced container handling unit, container transfer enhancement, and trailer (M1076) as the PLS and can be equipped with water or fuel racks to transport bulk products as necessary.

DISTRIBUTION COMPANY TRANSPORTATION PLATOON

2-32. The transportation platoon provides transportation support to the brigade and distributes supplies to the FSCs. There are a different number of truck squads in the transportation platoons to support maneuver brigades; the armored and Stryker brigade BSBs each have four squads, and the infantry brigade BSBs have three squads. Based on the type of brigade the distribution company supports, it can be equipped with PLSs, LHSs, or variants of the FMTV. Many BSBs will establish a hub with the distribution company and have the FSCs pick up supplies in the BSA and use the transportation platoon to support BSA internal movements of critical resupplies. The transportation platoon can also perform unit distribution to the FSCs. The BSB SPO and S-3 should determine the transportation platoon's role in the overall support plan and balance the anticipated requirements versus the flexibility inherent when retaining some or all of the transportation platoon in a reserve role.

FORWARD SUPPORT COMPANY DISTRIBUTION PLATOON

2-33. The FSC provides its maneuver battalion with field feeding, water, bulk fuel, general supply, transportation, ammunition, and field maintenance in a direct and habitual support relationship. The distribution platoon consists of the platoon headquarters, class III section, general supply section, and the class V section. The class III section provides retail class III bulk fuel distribution to the battalion. The general supply section provides the distribution of classes II, III (P), IV, and IX to the supported battalion. The class

V section provides the distribution of ammunition to the supported battalion. For more information, see ATP 4-90.

2-34. Distribution platoons are equipped with a variety of vehicles to support their mission. Each platoon can be authorized to have the PLS, LHS, and other variants of the HEMTT based on the unit it is designed to support. Other notable differences in the organization of the distribution platoon are that the airborne infantry brigade has a specific transportation section in their distribution platoons for the movement of infantry Soldiers.

LIGHT SUPPORT BATTALION

2-35. The light support battalion is assigned to the DSB and operates in direct support of its supported mobile brigade. It provides direct support logistics, field maintenance, and Role 1 and 2 medical support to the mobile brigade. See ATP 4-90 for additional information. The light support battalion, displayed in figure 2-6, consists of headquarters and distribution company, maintenance supply company, medical company, and three combat logistics companies. Transportation capabilities can be found in the headquarters and distribution company and the combat logistics company.

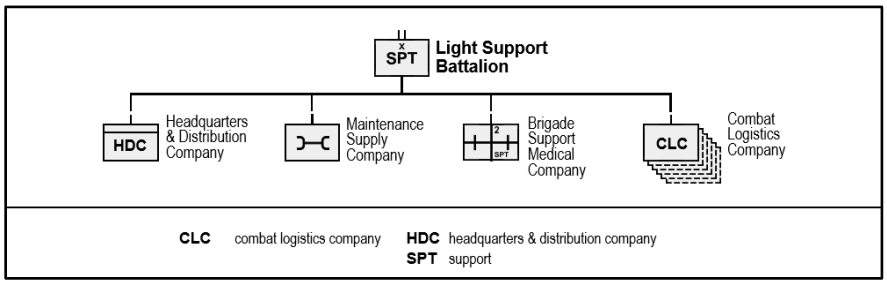


Figure 2-6. Light support battalion

Headquarters and Distribution Company

2-36. The headquarters and distribution company provides command and control, administrative, and logistics support for all organic, assigned, and attached units to plan, direct, and supervise supply support operations and supply distribution to the mobile brigade. The headquarters and distribution company consists of a battalion command section and staff, company headquarters and field feeding section, transportation platoon, and a fuel and water platoon. The transportation platoon has PLS trucks and trailers and transports supplies and ammunition to support the mobile brigade. The fuel and water platoon receives, stores, and distributes bulk fuel and water.

Combat Logistics Company

2-37. The combat logistics company provides logistics in direct support to an infantry battalion. It provides field feeding, bulk fuel, general supply, ammunition, and field-level maintenance. The combat logistics company consists of a company headquarters and field feeding section, distribution platoon, and a maintenance platoon and maintenance control section. The distribution platoon provides distribution of ammunition, fuel, and supplies. It also oversees logistics package operations and manages the distribution of supplies coming from or passing through the combat logistics company in support of the infantry battalion. See ATP 4-90 for additional information on the combat logistics company.

DUTIES AND RESPONSIBILITIES

2-38. FM 4-0 and ADP 6-0 provide details for the motor transport battalion commander and staff who command and direct assigned or attached units. The duties and responsibilities inherent within a motor transport company enable the exercise of mission command of the company. Motor transport companies vary in the type of assets authorized and the capabilities of assigned equipment. Key leaders and personnel generally have the same duties and responsibilities, regardless of authorized equipment. The following paragraphs address the duties and responsibilities of the key personnel common to a motor transport company.

COMPANY COMMANDER

2-39. The company commander is overall responsible for mission accomplishment and the training, safety, security, and discipline of assigned Soldiers. Officers and noncommissioned officers (NCOs) assigned to the company assist and advise the company commander. The commander is responsible for leading, developing, and mentoring subordinates. The commander leads the company by planning, directing, and supervising company operations to accomplish missions. The commander guides the unit in carrying out its primary mission of providing efficient and effective transportation support. The commander executes mission command to empower subordinate decision making and decentralized execution appropriate to the situation. The commander uses mission and operational variables to improve their situational understanding and to visualize, describe, direct, lead, and assess operations and employment of the company.

2-40. The commander maintains accountability and visibility of employed company assets and personnel and maintains a high degree of operations security. The commander establishes unit policies and procedures. The commander also enforces the principles of supply economy through proper use, care, maintenance, and accountability of individual and organizational equipment and materiel. The commander establishes a program to train personnel designated as operators and crew members to properly operate and perform preventive maintenance checks and services on their assigned equipment. The commander emplaces standards and practices to achieve and maintain a high degree of unit readiness.

FIRST SERGEANT

2-41. The first sergeant is the senior NCO in the company and assists the company commander in providing efficient and effective transportation support. At the direction of the commander, the first sergeant is employed throughout operations to extend command influence, assess morale of the force, adjust administrative requirements to aid in mission accomplishment, and assist during critical events. The first sergeant carries out policies and enforces performance standards.

2-42. The first sergeant is responsible for the health, welfare, morale, readiness, and professional development of all assigned Soldiers. The first sergeant assists the commander in maintaining accountability and visibility of employed company assets and personnel. The first sergeant is the senior enlisted advisor to the commander on all matters, to include operations, administration, promotion, retention, awards, and physical readiness training. The first sergeant also supervises and enforces maintenance and accountability of individual and company-assigned equipment.

2-43. The first sergeant is the commander's primary logistics and tactical advisor and is an expert in collective skills. The first sergeant helps the commander and operations officer/executive officer plan, coordinate, and supervise all logistics activities that support the company mission. The first sergeant collects data for the company logistics status report and personnel status report and forwards each to the battalion administrative and logistics operation center as required.

2-44. The first sergeant will conduct training and ensure proficiency in individual and collective tasks, while executing and supervising routine operations. The first sergeant will receive incoming personnel, assign the personnel to subordinate elements, and maintain foundations for company discipline. The first sergeant will also coordinate for the movement of Soldiers killed in action to the supporting mortuary affairs collection point.

OPERATIONS SECTION

2-45. The operations section provides coordination between operating elements of the truck platoons, maintenance platoon, and tasking units. It also conducts planning, integration, employment, tasking, and control of future autonomous platforms within convoy operations. The operations section consists of an operations officer, truckmaster, and dispatcher. The following describes their positions and duties.

Operations Officer/Executive Officer

2-46. Under the guidance and direction of the commander, the operations officer prepares and executes operational plans for the company. The operations officer assists the commander in coordinating, supervising, and controlling company operations. The operations officer coordinates logistics, maintenance, medical, and food service support. Coordination is conducted directly with the battalion S-3 and operating elements of the

truck platoons, maintenance platoon, and tasking unit to provide efficient, effective, and timely support. The operations officer receives requests for motor transportation support, conducts planning, and, with the commander's approval, assigns specific operational tasks to subordinate platoons. The operations officer maintains visibility on mission progress by operating the company's communication net control station. The operations officer prepares tactical standard operating procedures (TSOPs), maintains visibility over all employed company assets, and maintains situational awareness of current road network data.

2-47. Depending on the task organization and mission of the unit, a lieutenant is assigned in the company headquarters with either the title executive officer or operations officer; both of which act in the same capacity (for simplicity, this description will use the title executive officer). The executive officer is second in command of the company and is the primary internal logistics planner and coordinator. The executive officer and the company headquarters section serve as the company staff and operate the company command post. The company executive officer conducts continuous battle tracking and ensures that timely tactical reports are sent to the tactical operations center. The executive officer, in conjunction with the first sergeant, plans and supervises the company logistics and defense effort before, during, and after operations. This officer develops the company operations order for the commander and conducts tactical and logistics coordination with higher, adjacent, and support units. The executive officer will also assume command of the company in the absence of the commander. This officer also provides operational support, such as—

- Receiving and distributing information and intelligence to subordinate platoons.
- Maintaining and forecasting operational readiness data and vehicle availability rates with assistance from the maintenance control officer.
- Establishing procedures for dispatching and security and performing inspections as necessary.
- Requesting road clearance for convoys and for the movement of oversized loads.

Truckmaster

2-48. The truckmaster is assistant to the operations officer and the company commander. The truckmaster participates in convoy planning and enforces march discipline. Truckmasters supervise through the unit dispatchers. They assist the operations officer in creating operational plans, preparing reports, conducting inspections, and maintaining visibility of employed company assets and personnel. The truckmaster coordinates with platoon sergeants and the maintenance officer on all maintenance-related matters and status of vehicle availability and maintains documentation on unit accident reports. The truckmaster also enforces environmental laws and regulations.

2-49. The truckmaster supervises vehicle operations, enforces safety rules, and reports evidence of vehicle neglect, abuse, or operator carelessness. The truckmaster maintains driver qualification records on unit personnel and ensures each Soldier is properly trained according to unit policy and standards before licensing. For this reason, the truckmaster is normally assigned the additional duty of the company master driver. The truckmaster records safe driving mileage accumulated by unit drivers and advises the commander of personnel eligible for safe driving awards. The truckmaster is required to be licensed on all vehicles assigned to the company and conducts road testing and qualifications. Additional duties and responsibilities are listed in AR 600-55.

Master Driver Trainer

2-50. Master driver trainers provide commanders at the brigade and battalion levels the capability to develop, execute, and maintain the driver's training program required to execute wartime missions safely and efficiently. Master driver trainers are responsible for managing unit-level standardized driver's training programs required to safely execute unit missions. They advise commanders on developing and implementing training programs in accordance with Army regulations including operator safety, risk management, accident avoidance, field expedients, vehicle recovery, operation of materials handling equipment, convoy operations and security, vehicle loading and security, load planning, transportation of hazardous materials, driver's training aids, devices, simulators, and simulations integration, and new equipment training. Master driver trainers are the subject matter experts that bridge the training gap and are the single point of reference for the execution of the Army Drivers' Training Strategy within commands. Additional duties and responsibilities are listed in AR 600-55.

Dispatcher

2-51. The dispatcher, under the supervision of the truckmaster, operates the company vehicle operations center. Dispatchers assemble transportation requests and work with the operations officer and truckmaster to assign transportation requirements to platoons. After validated requests are assigned, the dispatcher will maintain visibility on the vehicles and drivers selected to execute the mission. The dispatcher will also note the requestor, type and quantity of cargo requested for movement, number of vehicles needed, length of time necessary for the mission, and disseminate applicable information to platoon leaders as necessary. The dispatcher will also maintain a vehicle dispatch board or digital spreadsheet with important information including number and type of assigned vehicles, detailed vehicle maintenance statuses, current and projected vehicle and personnel asset availability with locations, and should note the number of drivers with specific qualifications by platoon.

2-52. Dispatchers are normally the custodians for vehicle logbooks. Dispatchers verify entries and ensure that records are maintained manually and electronically as prescribed by DA Pam 750-8, local directives, and the Global Combat Support System-Army (GCSS-Army). Dispatchers are responsible for checking departure and return times for vehicles and issue, collect, and ensure the completion of trip records are accurate. They maintain records of miles traveled, fuel and oil consumed, trip frequency, elapsed time, cargo and tons moved, and anything else directed by superiors. The dispatchers report vehicle and record discrepancies and assist the operations section in maintaining visibility of employed company assets.

MAINTENANCE SECTION

2-53. An automative maintenance warrant officer plans, organizes, and executes field maintenance for ground vehicles and other applicable equipment, and provides guidance and oversight over personnel tools and equipment necessary to accomplish unit-level equipment maintenance. The maintenance section is responsible for field-level maintenance on organic vehicles, and for conducting recovery and refueling operations. The maintenance section uses GCSS-Army for maintenance management.

MOTOR TRUCK PLATOON

2-54. The motor truck platoon headquarters consists of a platoon leader and platoon sergeant. The platoon headquarters provides command and control, supervision, and technical guidance to multiple squads in the performance of motor transport support operations to fill vehicle task requirements.

Squad Leader

2-55. Each truck squad consists of personnel to operate assigned vehicle platforms. The squad leaders are responsible for their assigned Soldiers and responsible to the platoon leader and platoon sergeant for their training, discipline, and performance. They train and direct squad personnel in driver maintenance, correct loading techniques, safe driving practices, and supervise the maintenance of equipment. They report vehicle deficiencies beyond their squad's capacity to the platoon sergeant for corrective measures. The squad leaders develop individual training that directly complements and relates to platoon collective tasks and the company mission essential task list. The squad leaders maintain visibility of employed assets and personnel and are responsible for the use, care, and accountability of their squad's equipment. Prior to missions, the squad leaders ensure each Soldier is familiar with the route, destination, and mission, and they supervise mission execution.

Truck Crew

2-56. The truck crew consists of two Soldiers—a driver and an assistant driver. The position descriptions for each Soldier are described below. For detailed information on wheeled vehicle operator requirements, see TC-21-305-20.

Wheeled Vehicle Drivers

2-57. Drivers are well-trained and responsible; they are the backbone of the motor transport unit. They should know their vehicle, driver maintenance, convoy operations, and proper loading and unloading techniques. The drivers are responsible for the safe operation of their vehicles and for the safe and prompt delivery of

their loads. The drivers are responsible for operating assigned vehicles and effectively transporting cargo or personnel between designated points, following routes and instructions given by their squad leader. The drivers should be able to operate their vehicles under blackout conditions and over difficult terrain, and be familiar with the winch on the vehicle, if equipped. Although drivers may not physically load their vehicle or trailer, they are responsible to ensure loads are properly secured against inclement weather, pilferage, and damage due to terrain. The drivers are required to be knowledgeable on the operation of radios, various types of communications systems, and all weapons mounted to the vehicles. The drivers are required to perform preventive maintenance checks and services on their assigned vehicles and correct or report all vehicle deficiencies as required from the applicable TM -10 series. They will support mechanics as necessary and are responsible to service the vehicle with oil, fuel, water, and other lubricants or coolants as prescribed. The drivers will maintain tire pressure and change tires as needed. The drivers are also responsible for preparing the vehicle for any type of operation, including movement by air, rail, or vessel. The drivers complete individual driver trip records, gather information for accident reports, camouflage the vehicle, and comply with environmental laws and regulations. The drivers may also perform vehicle self-recovery.

Assistant Driver

2-58. The assistant driver should be licensed and able to perform the same duties as the primary driver. Overall, the assistant driver provides support for the driver and maintains constant vigilance and situational awareness during operations. The assistant driver also assists the driver as the ground guide and relays signals to other vehicles in the convoy. The assistant driver observes routes, highway markers, and the driver for signs of fatigue. The assistant driver is the primary operator for radios and other communications and navigation systems while en route. The assistant driver is also responsible for assisting the driver with tasks before, during, and after movements.

Chapter 3
Motor Transport Planning and Operations

Managers and leaders at all levels should be knowledgeable on the aspects of planning for motor transport operations. This chapter discusses command roles in transportation asset allocation, tactical operations that affect motor transport planning considerations, motor truck transport in support of distribution operations, methods of distribution operations, accountability of transportation assets, and maintenance services as they relate to Army motor transport operations.

COMMAND ROLES IN TRANSPORTATION ASSET ALLOCATION

3-1. TSC or expeditionary sustainment command (ESC) commanders at echelon develop movement programs for assigned operational areas. Each movement program is synchronized with movement control battalions (MCBs) for movement requirements among all transportation modes. The movement program incorporates and synchronizes all movements using joint, Army, and host-nation common-user transportation assets and movements originating from a movement request via a movement control team (MCT). Effective communication between the TSC, ESC, MCB, DSB, and sustainment brigades is required to execute an efficient movement program.

3-2. The movement program facilitates projected and anticipated transportation requirements for movement and flow of units, personnel, materiel, and sustainment supplies. During the movement planning process, movement planners allocate available transportation resources based on the supported commander's priorities. The movement program serves as an authority to commit transportation assets. It authorizes the MCTs to issue transportation movement releases, direct mode operators to provide assets, arrange commercial movements, and alert receiving units to accept program shipments so receiving units can unload transportation assets promptly.

3-3. Commanders at echelon assign transportation tasks as a tasking authority against the transportation movement release. The MCB or MCT will determine the most appropriate mode of transportation, such as truck or aircraft. See ATP 4-16 for additional information on movement programs, transportation movement releases, and the movement control process.

MOTOR TRANSPORT PLANNING CONSIDERATIONS

3-4. Commanders consider multiple operational variables when planning to allocate and employ transportation assets in support of Army operations. As a framework for planning motor transport support, commanders should use the strategic contexts of competition below armed conflict, crisis, and armed conflict in which Army forces conduct operations. This approach enables commanders and staffs to determine transportation requirements for tactical and sustainment mobility in a measured way (see ADP 3-0 and FM 3-0 for operations, and FM 4-0 and ATP 4-93 for sustainment operations).

3-5. Motor transport operations extend beyond distribution. Army motor transport assets are the most common enablers required for supporting reception, staging, and onward movement. Inland cargo transfer companies provide the capability to discharge, load, and transship cargo at terminals, and transportation truck companies provide HET transportation for movement of tracked vehicles. Future motor transport planning considerations include integration and control of autonomous platforms.

COMPETITION BELOW ARMED CONFLICT

3-6. Competition below armed conflict exists when two or more state or non-state adversaries have incompatible interests, but neither seeks armed conflict. Nation-states compete with each other using all instruments of national power to gain and maintain advantages that help them achieve their goals.

3-7. Some of the activities Army forces execute to prepare for armed conflict that involve motor transport

assets include—

- Setting the theater, resetting the theater, and conducting reception, staging, onward movement, and integration.
- Setting conditions for success during conflict.

3-8. Support to setting the theater involves theater opening; receiving initial forces, equipment, and supplies and assembling them into mission-tailored units; and transporting them to their final destination.

3-9. Development of a distribution plan depends on information regarding many variables including road and rail networks, inland waterways, airfields, truck availability, bridges, ports, cargo handlers, petroleum pipelines, materials handling equipment, traffic flow, choke points, and potential movement control complications. Movement of cargo in theater must comply with laws, regulations, and rules for transporting materiel as established by international agreements between the United States and the host nation. The combatant commander has the authority to set cargo restrictions within those limits.

3-10. Cargo restrictions vary from theater to theater. Non-materiel cargo restrictions include weight limits at ports of debarkation, vehicle weight and dimension limits on routes, and certain airspace controls. Materiel cargo restrictions may include explosives, pyrotechnics, POL, compressed gases, corrosives, and batteries. Planners also need to plan for host-nation administrative requirements for activities such as border crossings, customs, and diplomatic clearances. For additional information on sustainment during competition below armed conflict, see FM 4-0.

CRISIS

3-11. A *crisis* is an emerging incident or situation involving a possible threat to the United States, its citizens, military forces, or vital interests that develops rapidly and creates a condition of such diplomatic, economic, or military importance that commitment of military forces and resources is contemplated to achieve national and/or strategic objectives. (JP 3-0).

3-12. It is during crisis operations that plans and estimates are refined, the theater distribution network is expanded, and actions are taken to deploy forces as required and updated based on the operational environment.

3-13. The sustainment plan includes the distribution plan and movement plan. The distribution plan describes how sustainment flows from the theater base to the tactical level and return. The movement plan is a product of the distribution plan and synchronizes motor transport resources with transportation requirements, applies movement control measures, and mitigates shortfalls by applying established priorities. The distribution plan is a living plan that can be adjusted to support various requirements or operations.

ARMED CONFLICT

3-14. Armed conflict occurs when a state or non-state actor uses lethal force as the primary means to satisfy its interests. Armed conflict can range from irregular warfare to conventional warfare and combinations of both. Planners must understand Army motor transport unit capabilities while supporting strategic operations; the capabilities for each context are unique and must be anticipated.

3-15. *Large-scale combat operations* are extensive joint combat operations in terms of scope and size of forces committed, conducted as a campaign aimed at achieving operational and strategic objectives (ADP 3-0). Large-scale combat operations will require the distribution system to move a greater volume of personnel and equipment than in other types of operations. Increased velocity and precision will be required to sustain operations.

3-16. Sustainment commanders ensure as much dispersion as tactically prudent to rapidly displace and prevent destruction. Wide dispersion of forces and lengthening lines of communications create challenges for movement control, in-transit visibility (ITV), terminal operations, mode operations, and many other sustainment activities. The POL pipeline presents the same challenges. Pipeline security can be a significant challenge and cover a very large or isolated geographical area. Sustainment commanders must anticipate mitigating challenges presented by the need to disperse versus priorities of support. Shortfalls in transportation assets will require deliberative planning to overcome these mobility challenges. Sustainment commanders must plan for multiple shorter transportation movement over large disperse areas and consider

all technology to facilitate continuous movement. A continuous movement flow will enable support to degraded maneuver units.

3-17. The ability of a commander to posture friendly forces for an operation depends on the commander's ability to move those forces. Sustainment of troop movement is paramount. *Troop movement* is the movement of Soldiers and units from one place to another by any available means (FM 3-90). Troop movements are made by different methods, such as dismounted and mounted marches using organic combat and tactical vehicles, motor transport, and air, rail, and water means in various combinations. The method employed depends on the situation, the size and composition of the moving unit, the distance the unit must cover, the urgency of execution, and the condition of the troops. It also depends on the availability, suitability, and capacity of the different means of transportation. Troop movements may also be used as a form of deception. Concealing troop movements may deceive the adversary and divert their efforts from the main objective. Troop movements over extended distances have extensive sustainment considerations. Movement control boards are critical for planning and enabling troop movements. Movement control boards support synchronization and coordination of troop movement against distribution priorities.

3-18. If an unforeseen change in priorities requires a change to the transportation movement request after movement is initiated, the MCT contacts the mode operator's convoy commander by radio or digital messaging to provide the revised transportation movement request. Transportation units normally have a mix of radio and digital communication systems mounted in their vehicles; almost every vehicle in the company will be equipped with radios for internal and external communication. If a convoy is out of radio range and lacks digital communication devices, the revised transportation movement request may be communicated to the convoy commander at an MCT or military police checkpoint along the convoy's route. For additional information on sustainment during large-scale combat operations, see FM 4-0.

Defensive Operations

3-19. A *defensive operation* is an operation to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability operations (ADP 3-0). The defense is a decisive operation conducted to defeat an enemy attack. Although a defensive operation normally does not achieve decisive victory, it sets the conditions necessary to regain the initiative through counterattacks.

3-20. Movement managers must understand and anticipate how terrain, defense obstacles, fire support coordination measures, movement restrictions, and terrain will affect the methods of resupply. These factors must be considered in all distribution management and movement control plans.

3-21. Movement managers should expect requirements for items (class III [B], IV, V, and IX repair parts) to increase during defensive operations. Unmanned aircraft systems often require motor gasoline or aviation gasoline. This requirement must be included in logistics status reporting, requisitioning, storage, and distribution.

Offensive Operations

3-22. An *offensive operation* is an operation to defeat or destroy enemy forces and gain control of terrain, resources, and population centers (ADP 3-0). Offensive operations impose the commander's will on the enemy. Against a capable, adaptive enemy, the offense is the most direct and sure means of seizing, retaining, and exploiting the initiative to gain physical, temporal, and cognitive advantages and achieve definitive results. Executing offensive operations compels the enemy to react, creating or revealing additional weaknesses that the attacking force can exploit.

3-23. Offensive operations involve an intense operational tempo, requiring sustainers to continually update their running estimates to anticipate friction points on the battlefield. Sustainers need to be able to accurately envision the offensive operation in time and space to accurately forecast operational requirements. Sustainers must also—

- Expect sustainment resupply and support elements to operate in the deep and close areas while supporting offensive operations. Sustainment units must understand operational control measures to include passage of lines and crossing of boundaries with maneuver forces in the offense.

- Understand and anticipate how terrain, enemy action, fire support coordination measures, and movement restrictions will affect the methods of resupply. These factors must be considered in all distribution management and movement control plans.
- Expect increase in items (class III [B], V, and IX) to support offensive operations. Ensure adequate transportation assets are available to move supplies and equipment forward in the operational area.

PLANNING FOR MOTOR TRUCK TRANSPORTATION

3-24. Commanders and staffs should be very deliberate in planning sustainment support and plan for support essential to mission accomplishment. Planning for non-essential support puts unnecessary demands on already-limited distribution and transportation assets and puts mobility capabilities at needless risk. This may also deprive units of support for which they have a legitimate requirement. As an example, if HET support is required with no additional transportation needed, commanders should request a HET company, not a CTC (heavy). The CTC comes with additional, unneeded types of trucks that will only burden the mission and waste a critical asset that can be legitimately used elsewhere.

3-25. Planning for motor truck support should consider mission requirements, capabilities, and shortfalls. Planning ensures the proper allocation of transportation assets to fulfill mission requirements based on the commander's priority of effort and intent. The unit's leaders determine what mitigations steps are necessary to overcome any capability shortfalls.

3-26. If common-user land transportation assets are not available to mitigate capability shortfalls, movement planners should generate a transportation movement request through the representative transportation officer at echelon to assign the movement mission to a capable mode operator. Planners who determine asset requirements should also consider economy of force and type of platform most effective for mission requirements. For additional information on motor transport planning, see FM 4-0. For additional information on the movement request process, see ATP 4-16.

3-27. Movement planners should select the best vehicle platform for a specific load that considers proper distribution of weight to maximize effort. The load is based on the units' capabilities and availability of equipment to perform the required task. Planners should ensure transportation assets are fully loaded, with consideration of weighing out the vehicle's capability versus cubing out. Unexpected changes to mission, emergencies, or critical command-directed movements should be the only logical reason to under-utilize carrying capacities.

3-28. Vehicle platforms which are equipped with a container handling unit (such as the PLS, HEMTT LHS, and the CROP) will reduce the handling requirements on the battlefield and extend throughput capacity using the flatrack exchange method. Although supporting units are responsible for providing their own materials handling equipment along with personnel to assist in the loading and downloading of cargo, movement planners should validate that the supported customer has these capabilities.

3-29. Planning offload operations with the supported unit S-4 is critical for streamlining efforts and minimizing time on ground. Close coordination between the motor transport unit headquarters, mode operator, supporting MCTs, and the supported unit will alleviate potential problems and expedite the return of transportation assets to the distribution system.

3-30. To maximize efficiency and properly balance capabilities and requirements, motor transportation planners should analyze multiple factors such as the type and method of haul, the load and types of anticipated cargo, and terrain. Other planning factors are availability rates, vehicle payload capacity, and operational shift hours, any of which can reduce the quantities, capacities, or capabilities available. The following are more considerations for planning motor transport operations:

- Determining availability of materials handling equipment, capacities of routes, and available areas for company areas, parking, convoy support centers (CSCs), and trailer transfer points (TTPs).
- Reviewing convoy support requirements such as fuel, convoy security, medical support, maintenance support along the route, class I requirements, and overnight locations if required.
- Validating driver documentation, such as travel orders, valid driver's licenses, motor vehicle documents, Motor Vehicle Ground Accident Form, SF 91 (*Motor Vehicle Accident [Crash] Report*).
- Determining the method of requested delivery.
- Calculating the distance, rate of march, catch-up speed, and possible route delay times.

- Anticipating threats and specifying force protection requirements.
- Assessing the use of emerging capabilities, such as leader-follower technology to counter threats during motor transport operations. (See appendix M for additional information on future fielding.)
- Planning road movements, preparing march tables, submitting movement bids, coordinating en route support, and continually understanding the tactical situation, including weather and terrain.
- Planning for the control, safety considerations, and drivers training required for the integration of autonomous platforms.

3-31. Tactical convoy operation procedures are vital to survivability for motor transport units to protect personnel, cargo, equipment, and assets against threats while convoys provide mobility support across large, contested battlespaces. The convoy commander should use the convoy troop-leading procedures (receive the mission, issue the warning order, gather intelligence, make a tentative plan, conduct pre-movement preparations, complete the plan, issue the convoy brief, and supervise) and integrate them into tactical convoy operations. Having a thorough understanding of tactical convoy operation procedures will help mitigate enemy threats, reduce asset losses, and increase survivability for motor transport units. For additional information on tactical convoy operations procedures, see ATP 4-01.45.

THE ROLE OF THE MOBILITY WARRANT OFFICER IN PLANNING

3-32. The mobility warrant officer is the resident deployment and distribution technical expert typically assigned to divisions, corps, ESCs, TSCs, MCBs, and maneuver brigades. The mobility warrant officer advises commanders on the deployment process, ensuring rapid transmission of movement requirements into the defense transportation system. The mobility warrant officer develops and conducts training associated with unit movement operations and oversees deployment readiness in accordance with the commander's guidance. The mobility warrant officer plans, coordinates, and orchestrates the execution of retrograde, deployments, and redeployments. The mobility warrant officer provides distribution advice to facilitate theater sustainment operations. The mobility warrant officer also assists with determining the appropriate training for the unit movement officers.

3-33. The mobility NCO is assigned with the mobility warrant officer. This NCO provides training in unit movement operations and documents Army deployment, redeployment, and distribution. The mobility NCO works in conjunction with the mobility warrant officer to coordinate deployment and distribution actions with multinational, joint, Army, and commercial agencies through the Joint Logistics Enterprise.

MOTOR TRANSPORT IN SUPPORT OF DISTRIBUTION OPERATIONS

3-34. Motor transport units support several types of theater distribution nodes by moving and transferring personnel, equipment, and supplies in support of theater distribution. This section will explain motor transport support relative to different types of distribution operations and the command, control, and technical supervision of units conducting these operations.

HHD, TRANSPORTATION MOTOR TRANSPORT BATTALION

3-35. The transportation motor transport battalion has multiple responsibilities in the execution of distribution operations. In addition to providing command and control of subordinate elements, this battalion also—

- Translates transportation requirements from higher headquarters into specific vehicles or units required.
- Supervises the operation of truck terminals, TTPs, and/or a trailer relay system.
- Coordinates and evaluates highway traffic plans affecting transportation support including terrain, road conditions, and security.
- Supervises and coordinates the battalion's external mission support.

INTERMODAL OPERATIONS

3-36. *Intermodal operations* involve the process of using multiple modes (air, sea, highway, rail,) and conveyances (truck, barge, containers, pallets) to move troops, supplies and equipment through expeditionary entry points and the network of specialized transportation nodes to sustain land forces (ATP 4-13). It is the

movement of cargo and personnel using two or more transportation modes (surface and air) from point of origin to destination to reduce cargo handling and thereby speed delivery.

TERMINAL OPERATIONS

3-37. Terminal operations are a component of intermodal operations and are essential in supporting deployment, redeployment, and sustainment operations. Terminals are generally classified based on the following attributes: physical characteristics, type of transport assets used, type of cargo handled, and the methods used for cargo handling. The primary types of terminals operated by the Army include land, air, and maritime. See ATP 4-13 for additional information on terminal operations.

3-38. Terminal clearance operations occur when motor transport units move personnel and cargo out of terminals. Rapid clearance allows for speedy discharge of aircraft or ships that may otherwise be hampered by congestion within the terminal area. The terminal operator (military, civilian, or joint operation) is responsible for off-loading the ships or planes. An MCT should be located at the terminal to plan and coordinate clearance. The transportation terminal battalion may assist in planning, setting up truck operations, and regulating the flow of vehicles in the terminal area.

3-39. Ideally, heavy maneuver units move their tracked vehicles from the port of debarkation to forward assembly areas by HETs, but these can be augmented by other transportation modes. When tactical considerations are not paramount, it may be ideal to move heavy units by rail; however, the use of HETs should be maximized in tactical environments that require immediate movement.

3-40. In-transit storage may be required at the origin port, destination port, intermediate terminals, or TTPs. In-transit storage on vehicle platforms should be discouraged because it reduces the capability of recipient units by delaying receipt of their equipment, while also increasing the number of vehicles required.

3-41. Motor transport units work closely with aerial ports of debarkation, usually conducting local hauls and line hauls as necessary. Vehicles often transport personnel, vehicles, trailers, containers, and palletized materiel to aircraft at an embarkation air terminal or at airfield logistics pads. Once transported by the aircraft to the destination air terminal or airfield, personnel and equipment are off-loaded then immediately loaded onto vehicles for movement to a hub or the final destination.

3-42. Seaport of debarkation intermodal operations are prevalent with motor transportation to and from the port. Various ships move large amounts of equipment and supplies, and motor transport is a common intermodal option used to transport materiel. Vehicles, trailers, and containers are often transferred between ships and motor transport in the following ways:

- During roll-on/roll-off operations, vehicles or semitrailers are loaded aboard roll-on/roll-off watercraft and moved to a destination water terminal. During discharge, the vehicles or semitrailers are driven or towed directly from the ship.
- During lift-on/lift-off operations, loaded trailers or containers are moved to a water terminal, uncoupled from their prime movers, and crane-loaded aboard the ship.
- Lighter aboard ship operations include vehicles, semitrailers, or containers aboard lighterage and launched from ships. They are especially useful where deep water port facilities are not available.

3-43. Railhead operations occur between rail and motor transport modes. The equipment is unloaded from the railhead, coupled to suitable towing vehicles, and delivered to the destination. Normally vehicles, trailers, and containers are transferred between railheads and motor transport, but palletized equipment or supplies can also be transferred with proper materials handling equipment. There are two types of operations used to move trailers or containers from motor transport vehicles:

- Trailer on a flatcar operation. Semitrailers are moved during local haul to a railhead, placed on railcars, and moved by rail to the railhead servicing the destination area. The trailers are unloaded from the railcars, coupled to suitable towing vehicles, and moved to their destination. This method combines the economy of rail hauls with the door-to-door service of the truck. Where large amounts of cargo are involved, the rail operation becomes one segment of a relay.
- Container on a flatcar operation. This works the same as the trailer on a flatcar method, except that containers are involved instead of semitrailers. Containers can either be loaded on flatcars while mounted on chassis or loaded directly onto the deck of the transporting flatcars.

CONVOY SUPPORT CENTERS

3-44. A CSC is an organization that is task organized and forms the connecting link between local and line haul operations. CSCs are normally established to allow for refueling, resupply, life support, vehicle repair, and overnight rest for drivers. CSCs are usually located in or near centers of concentrated trucking activities at both ends of a line haul or at intermediate locations. They are usually located forward of cargo pickup points and to the rear of delivery points. The CSC should be located near supported activities and the main supply route (MSR). The locations and number of these centers depend upon the organization of the line haul operations and the location of supported units.

3-45. The size, complexity, and duration of operations are key features to consider in selecting sites for CSCs. The number and type of vehicles employed are also vital in selecting a location, along with the facilities required at the CSC and anticipated traffic of semitrailers at or through the sites. The area should be large enough and have an acceptable internal road network to allow space for both the parking and marshalling of incoming and outgoing semitrailers and tractors. The area should be leveled, well drained, and have a suitable hardstand for maintenance that can withstand heavy vehicular traffic.

3-46. Space requirements may not make it feasible for CSCs and TTPs to be adjacent to the MSR. If this is the case, and if good feeder routes are available, establish CSCs and TTPs off the MSR. CSCs may also be co-located with motor transport units in motor park areas within a hub. Security plan considerations should address both the operating area and the vehicles and cargo handled within the area. The motor transport unit at the location provides local security. When the CSC is part of an operating base, the operating base commander coordinates added security based on the threat level.

TRAILER TRANSFER POINTS

3-47. TTPs are set up along line haul routes to divide the line haul into legs. At TTPs, semitrailers or flatracks are interchanged between line haul vehicles operating over adjoining legs of a local or line haul route. TTP functions also include reporting, vehicle and cargo inspections, documentation, and dispatching. See ATP 4-13 for additional information.

Trailer Transfer Point Team Organization

3-48. A TTP team is a table of organization and equipment organization that operates a TTP or CSC. The TTP team is normally attached to a motor transportation battalion or a CSSB. There are two sections in the TTP team. The TTP operations section provides command, control, and supervision of unit movement plans and routine specialized operations. The maintenance section provides field maintenance to organic wheeled vehicles and emergency maintenance for up to 10 percent of transit vehicles and semitrailers. The unit cannot be broken down to smaller elements.

Trailer Transfer Point Team

- **Assigned:** To a TSC, normally attached to a transportation battalion or a CSSB.
- **Employment:** Normally operates at EAB but may be required to operate in the brigade area.
- **Basic of Allocation:** One per corps or division headquarters and based on line haul movements rates for a 6-hour terminus.

3-49. The TTP is dependent upon a support maintenance company for all field-level maintenance except automotive. The unit provides emergency refueling and repair of vehicles transiting the TTP. The unit also provides area recovery of disabled vehicles operating in the line haul operation. The team prepares and maintains operational records and reports on organic equipment. The TTP has 20 percent mobility of its table of organization and equipment supplies and equipment and requires external mobility support to be transported in a single lift.

Trailer Transfer Point Operations

3-50. TTPs are often co-located at hubs or operating bases. TTPs operating independently may provide mess, maintenance, and other support for TTP personnel and line haul drivers. TTPs are not used for pickup and delivery of cargo, but act as a point to create a feasible driving leg for drivers.

3-51. Line haul tractors arriving from rear areas deliver loaded semitrailers at TTPs and pick up empty or retrograde semitrailers for return movement. Line haul tractors coming in from forward areas drop their empty or return-loaded semitrailers and pick up the forward-moving loads for further movement toward ultimate destinations. Shuttle tractors may be used within TTPs to spot and prepare semitrailers for movement. This action reduces turnaround time of line haul tractors and makes the operation more efficient.

3-52. The distance of a line haul leg is based on a 10-hour shift per driver and 1 hour of delay. Therefore, the optimum one-way travel time between TTPs is 4.5 hours. Using this planning factor, each driver can complete one round trip per shift. This eliminates the need for billeting drivers away from their assigned unit, provides rested drivers for each trip, and allows for vehicle maintenance. Figure 3-1 displays a notional TTP.

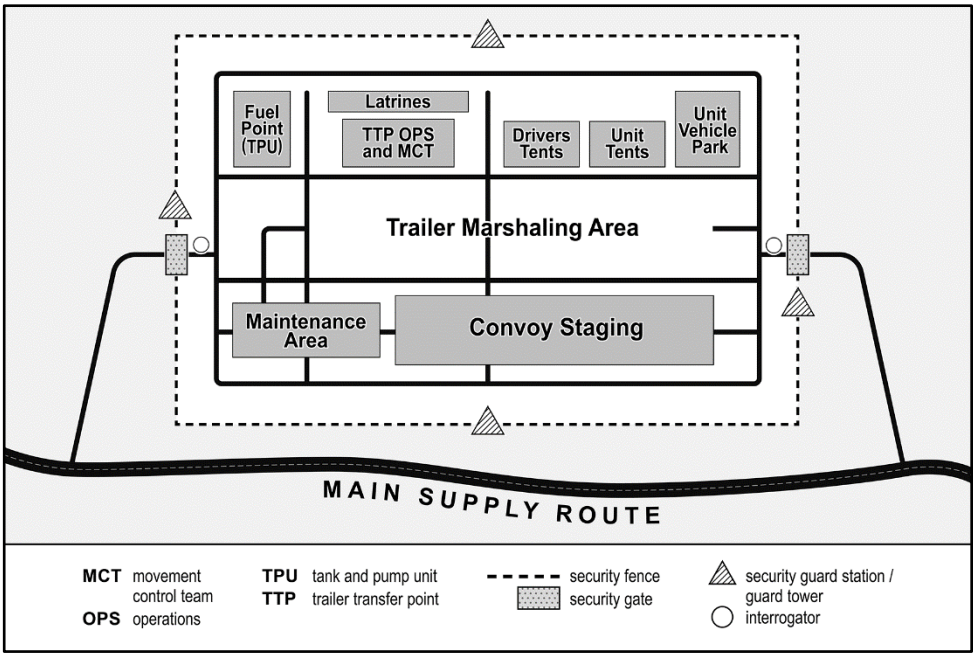


Figure 3-1. Notional trailer transfer point

CONTAINER TRANSPORT OPERATIONS

3-53. Containers are specially designed cargo carriers which permit the packaging of small and loose cargo items into a single unit for security and ease of handling. Containers are a safe, secure means for loading cargo at a supply source. The container is sealed at the supply source, with no need to open it or handle the cargo until it is delivered to its destination. Cargo security is enhanced, and cargo can be expected to be received intact and in serviceable condition. See ATP 4-12 for more information on Army container operations.

3-54. Containers are hauled using any of the transport modes. Containers transported by trucks are handled as any other cargo. Pickup, movement, and delivery are made according to the type of haul for which the motor transportation is committed. Movement of containers requires materials handling equipment and container handling equipment at the origin and destination.

RETROGRADE

3-55. During retrograde operations, the use of motor transportation assets will increase—particularly for transporting heavy equipment. Retrograde includes moving serviceable and unserviceable main battle tanks, infantry/cavalry fighting vehicles, Stryker systems, and other heavy equipment. Motor transport units should expect multiple interzonal operations across boundaries within the theater. ***Interzonal Operations*** **are operations which cross area of operation boundaries of a specific transportation organization and operate under the area control of more than one headquarters or command**. Retrograde includes transporting large numbers of personnel and equipment, casualty evacuations, and returning human remains. For additional information on retrograde, see FM 4-0.

3-56. Retrograde movements should be a key planning consideration for forward distribution operations and coordinated through movement control channels. Retrograde movement requests are programmed like any other movement requirement. Synchronization is also required to ensure drivers receive accurate information. Communication is essential for rerouting or diverting vehicles in the forward area. Drivers may report to a different loading site some distance from their unloading point to pick up return loads. Drivers may also pick up or deliver return loads anywhere along the return route.

RECONSTITUTION

3-57. *Reconstitution* consists of actions that commanders plan and implement to restore units to a desired level of combat effectiveness commensurate with mission requirements and available resources (ATP 3-94.4). Reconstitution operations consist of three elements: assessment, reorganization, and regeneration. They involve the cross leveling of forces and resources and the replacement of personnel, weapon platforms, equipment, and supplies following combat operations to restore degraded units to combat effectiveness.

3-58. Army motor transport units will likely provide a preponderance of the motor transportation support during reconstitution operations. The increased demand of motor transportation support during large-scale combat operations and the possibility of additional reconstitution support requirements will strain motor transportation assets. For additional information, see ATP 3-94.4 and FM 4-0.

METHODS OF DISTRIBUTION OPERATIONS

3-59. Motor transport units use various methods to support distribution operations. Those methods involve hauling goods across boundaries (intrazonal and interzonal). The hauling methods are categorized by distance and transit time. ***Intrazonal operations*** **are operations confined within a specific transportation organization's area of operation**. The territorial boundaries are under the jurisdiction of one headquarters or command.

3-60. Interzonal operations occur outside a specific transportation organization's boundaries and are conducted under the area control of multiple headquarters or commands. Boundaries are defined between brigade, division, corps, and theater Army, and between adjacent brigades, divisions, and corps. These boundaries also correspond to movement control boundaries.

HAULS

3-61. Local hauls are shorter transportation movements and can occur multiples times a day. A ***local haul*** **is an operation in which vehicles can make two or more round trips per day based on distance and transit time**. Local hauls have short running times compared to line hauls. A local haul is usually an intrazonal movement within the brigade's AO. Vehicles typically used for local hauls include FMTV cargo trucks and the HEMTT LHS.

3-62. Line hauls are longer transportation movements and typically require operating shifts. A ***line haul*** **is an operation in which vehicles cannot make more than one round trip per day due to distance, terrain restrictions, or transit time**. Line hauls have long run times compared to local hauls and usually involve one trip or a portion of a trip per operating shift. Line hauls are more frequently interzonal, commonly crossing movement control boundaries (for example, across brigade, divisional, or geographic areas of responsibility) and may require additional coordination and support when moving across operational boundaries. Examples of line haul operations are throughput operations from ports or theater storage areas to a BSB. Vehicle types typically used for line hauls include tractor/trailer combinations, HET, and PLS. Line haul is especially feasible for operational movement of armored or mechanized forces.

HAULING METHODS

3-63. Motor transport units rely on four types of hauling methods to support the distribution system: direct haul, shuttle, relay, and hub and spoke. Figure 3-2 on page 27 illustrates the hauling methods.

Direct Haul

3-64. A ***direct haul*** **is a single transport mission completed by the same vehicle(s)**. It does not involve a transfer of supplies or exchange of equipment, as does hub and spoke (see below). Direct hauls are often used

for local hauls but can be used in line haul operations. CSCs are established to support direct line haul operations.

3-65. Direct hauls used for line haul operations are often referred to as express operations. Express operations are often established before trailer transfer or cargo transfer points have been set up. They may also be used when there is a need for rapid movement of tonnage over long distances and when normal line haul operations cannot meet the requirement. Express operations are usually inefficient over time and should only be considered for a short period of time.

Shuttle

3-66. A ***shuttle*** **is a single transport mission completed in repeated trips by the same vehicles between two points**. This method is commonly used in local hauls.

Relay

3-67. A ***relay*** **is a single transport mission completed in one trip and utilizes multiple vehicles without transferring the load**. This is commonly used in line hauls. It involves the continuous movement of supplies or troops over successive segments of a route. It is done by changing drivers, powered vehicles (tractors), or both for each segment. Containerized cargo or cargo on flatracks increase the effectiveness of this system and better uses the tonnage capabilities of vehicle platforms.

3-68. In addition to rapid throughput of cargo, the relay system allows for command supervision and supporting services in each segment of the route. A relay distribution system will have prepositioned drivers or vehicles at transfer points, minimizing stationary time for loads. Relays and hubs sound similar, but relays maintain velocity along one route for a single mission, while a hub links and forwards loads along several routes to separate destinations. A TTP can serve as a relay point or a hub, but not at the same time.

Hub and Spoke

3-69. *Hub and spoke distribution* is a physical distribution system, in which a major port serves as a central point from which cargo is moved to and from several radiating points to increase transportation efficiencies and in-transit visibility (JP 4-09). A ***Hub*** **is an organization that sorts and distributes inbound cargo from multiple supply sources**. An example of a hub terminal is a distribution center, TTP, centralized receiving and shipping point, CSC site, or BSA.

3-70. ***Spoke*** **is a portion of the distribution system that refers to the transportation mode operator's responsibility for scheduled delivery to a receiving unit**. The hub and spoke is similar to a relay in that it is a single transport mission completed in one trip by multiple vehicles but differs by transferring loads at hubs.

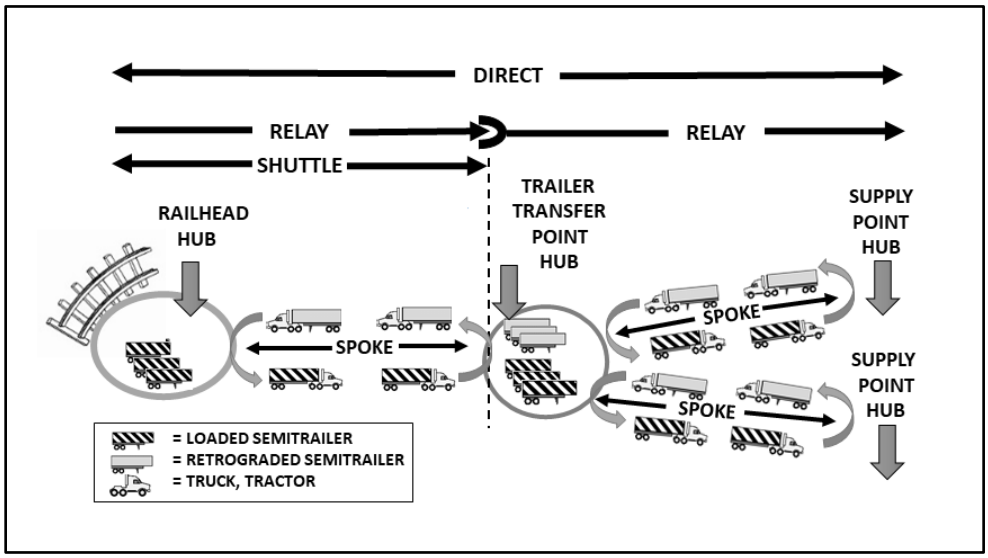


Figure 3-2. Direct, relay, shuttle, and hub and spoke

ACCOUNTABILITY AND MAINTENANCE OF TRANSPORTATION ASSETS

3-71. Assignment and accounting of semitrailers, flatracks, and CROPs will be in accordance with AR 710-2, AR 710-4, applicable Army regulations, Headquarters, Department of the Army G-4 policies and procedures, and GCCS-Army. Units use flatrack for rapid exchanges to meet sustainment demands supporting operations across the competition continuum and range of military operations. The intent enables units to drop loaded flatracks and retrograde exchanged flatracks without an overwhelming burden of supply accountability by serial number. This generates velocity and volume of sustainment commodities in an operational area. Refer to Headquarters, Department of Army G-4 updates to flatrack accountability policies and procedures. Accountability for containers will be in accordance with Army regulations and ATP 4-12.

MAINTENANCE AND REPAIR SERVICES

3-72. Vehicles engaged in line haul and relay operations may operate up to 20 hours a day for extended periods. Such heavy usage increases maintenance requirements. To provide maintenance services at CSCs or other terminals, motor transportation battalion headquarters may detach the required maintenance personnel, tools, and equipment from assigned companies or request augmentation maintenance teams. Motor transportation battalions may establish a consolidated maintenance facility to supplement or support unit-level maintenance operations by collating maintenance personnel and resources. For additional information, see ATP 4-33, applicable Army regulations, pamphlets, standard operating procedures (SOPs), and GCCS-Army for maintaining maintenance records and accountability of equipment. See Appendix B of this publication for more information on preventive maintenance.

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Appendix A

Transportation Support within Sustainment Headquarters

This appendix provides the capabilities of select sustainment commands and describes the relationship of transportation units and staff elements within those headquarters.

THEATER SUSTAINMENT COMMAND

A-1. The TSC is the Army's command for the integration and synchronization of sustainment in an area of responsibility. The TSC plans and synchronizes intratheater sustainment operations at the operational level of war. It is assigned to an Army Service component command and provides general support to Army forces. The TSC commands and task organizes attached ESCs, sustainment brigades, and additional sustainment units. For additional information on the TSC, see ATP 4-93 and FM 4-0.

Theater Sustainment Command

- **Role**: Synchronizes, coordinates, and integrates intratheater sustainment support.
- **Capability**: Plans and synchronizes intratheater sustainment operations at the operational level of war.
- **Command relationship**: Assigned to Army Service component command.
- **Support relationship**: General support to Army forces.

A-2. The theater movement control element is a multifunctional theater-level center assigned to the TSC or ESC to manage movement from the strategic to the operational level. It collocates with the distribution management center. The theater movement control element also enables the TSC to create a theater movement center when required. The theater movement control element is not designed or capable of providing command and control to subordinate units.

A-3. The MCB is a functional transportation battalion that executes movement control in an assigned operational area. The MCB is directly subordinate to the TSC or ESC and is a vital component in assisting in the planning and execution of deployment, redeployment, and distribution operations. The MCB and its subordinate MCTs are positioned to coordinate and synchronize the execution of movement control. For additional information, see ATP 4-16.

EXPEDITIONARY SUSTAINMENT COMMAND

A-4. An ESC may be attached to the TSC or theater Army. When attached to the TSC, the ESC typically executes the sustainment mission for the TSC throughout the area of responsibility. A task-organized ESC attached to a TSC normally includes one or more sustainment brigades, a transportation brigade (expeditionary), and an MCB to support theater opening, theater distribution, sustainment, and theater closing operations. The ESC normally deploys to provide command and control when multiple sustainment brigades are employed or when the TSC determines that a forward command presence is required. The ESC provides command and control of sustainment brigades and other units including MCBs. For additional information, see ATP 4-16, ATP 4-93, and FM 4-0.

Expeditionary Sustainment Command

- **Role**: Executes command and control for task-organized units. Plans and synchronizes current and future sustainment operations.
- **Capability**: Plans and synchronizes future sustainment operations in a joint operations area or an area of operations.
- **Command relationship**: Attached to a TSC or theater Army.
- **Support relationship**: General support in the theater of operations or joint operations area or direct support to corps.

CORPS SUSTAINMENT COMMANAND

A-5. The corps sustainment command is assigned to a corps. The corps sustainment command coordinates sustainment support and relays sustainment status across the logistics enterprise. It commands and controls all assigned and attached units and plans, integrates, and synchronizes sustainment support for the corps. The corps sustainment command controls distribution management, transportation operations, materiel management, and human resources support. Its distribution management center serves as the nucleus for corps materiel and distribution management functions. This branch synchronizes and integrates strategic sustainment support from Army field support brigades, United States Army Materiel Command life cycle management commands, and the Defense Logistics Agency.

Corps Sustainment Command

- **Role**: The senior sustainment command in the field Army or corps. Provides sustainment support to the field Army or corps through command and control of task organized sustainment brigades, a petroleum group, finance center, and movement control battalion.
- **Capability**: Executes logistics support, human resources, financial management, and distribution management operations at the operational and tactical levels of warfare.
- **Command relationship**: Assigned to a corps.
- **Support relationship**: Provides support to forces as directed in an operation order.

A-6. The corps sustainment command supports the field army and its theater enabling commands. It plans for near-term operations and assists the corps sustainment cell with planning and coordinating sustainment to meet the demands of current operations. The corps sustainment command and its subordinate task-organized functional and multifunctional sustainment units provide general support for all units in the corps AO. For additional information, see ATP 4-92.

SUSTAINMENT BRIGADE

A-7. A sustainment brigade is typically assigned or attached to a TSC, ESC, or division. The sustainment brigade is a multifunctional headquarters responsible for planning and synchronizing sustainment and integrating subordinate units into sustainment operations. It supports Army forces at the tactical and operational levels, providing support to corps and divisional units and units operating in its area. The sustainment brigade commands between three and seven battalions. A sustainment brigade is task organized to execute logistics, financial management, personnel services, and logistics including supply, maintenance, transportation, field services, distribution, and operational contract support. The sustainment brigade and its subordinate units will normally have a general support relationship with supported organizations. See ATP 4-93 for additional information.

Sustainment Brigade

- **Role**: Exercises command and control for all assigned, attached, and operational control sustainment units at EAB.
- **Capability**: Executes logistics, financial management, and personnel services functions. Can support theater opening at ports of debarkation when assigned to a theater Army.
- **Command relationship**: Attached to an ESC or corps.
- **Support relationship**: General support within a joint operations area and/or area of operations.

A-8. The SPO section of the sustainment brigade receives movement requests from a division transportation officer, MCB, or MCT and can assign tasks to subordinate battalions. The SPO will also maintain communications with the MCB for visibility and route deconfliction. The mobility branch determines transportation requirements for supported units, manages transportation capability, and coordinates movement control to the brigade. The SPO staff balances transportation requirements against transportation capabilities to meet mission requirements.

COMBAT SUSTAINMENT SUPPORT BATTALION

A-9. The CSSB is a multifunctional logistics headquarters. The CSSB is normally attached to a sustainment brigade. The CSSB is task organized with logistics capabilities to support specific requirements. Employed on an area basis, the CSSB plans, prepares, executes, and assesses logistics operations within an AO. The CSSB may also support units passing through its designated area.

Combat Sustainment Support Battalion

- **Role**: Exercises mission command for task organized companies, teams, and detachments executing logistics operations.
- **Capability**: Employ and command and control up to six company-sized units. Combat sustainment support battalion functions are transportation operations, maintenance operations, supply, field services, and command and control tasks.
- **Command relationship**: Attached to a sustainment brigade.
- **Support relationship**: General support to military forces.

A-10. The CSSB is a flexible and responsive unit that executes logistics throughout an AO providing transportation, maintenance, ammunition, supply, mortuary affairs, field services, water, and petroleum. The mission of the CSSB is to provide command and control to organic and attached units, provide training and readiness oversight, and provide technical advice, equipment recovery, and mobilization assistance to supported units.

A-11. The CSSB SPO transportation section plans and coordinates transportation operations and develops the movement plan for CSSB distribution operations. Movement requests are received by the CSSB SPO transportation section. The CSSB SPO transportation section consolidates the movement requests, verifies the requirements, and assigns the tasks to the type of truck company assigned or task organized to the CSSB. For additional information on the CSSB, see ATP 4-93.1 and ATP 4-92.

DIVISION SUSTAINMENT BRIGADE

A-12. The DSB is a multifunctional logistics headquarters assigned to a division. The DSB can provide command and control for up to seven sustainment battalions. The DSB's mobility section develops a movement program for transportation assets in coordination with the division transportation officer. The branch executes the sustainment command's movement program based on the division commander's established priorities. The DSB's mobility branch forecasts movement requirements for supplies, equipment, and personnel in coordination with the materiel management and human resources operations branch within the SPO section.

Division Sustainment Brigade

- **Role**: The primary senior sustainment advisor to the division commander for the sustainment warfighting function.
- **Capability**: Integration, synchronization, and execution of all sustainment operations (including medical) for the division.
- **Command relationship**: Assigned to a division.
- **Support relationship**: Direct support to a division or general support within area of operations.

A-13. The DSB's mobility branch balances transportation capabilities with division movement requirements in coordination with the division G-3 and division transportation officer. This includes planning known, anticipated, and contingency transportation requirements. For additional information on the DSB, see ATP 4-91 and FM 4-0.

DIVISION SUSTAINMENT SUPPORT BATTALION

A-14. The DSSB is a multi-functional logistics battalion organic to a DSB. The DSSB provides logistics support to a division. The role of the DSSB is to provide command and control for organic and attached units and synchronize and coordinate logistics operations in a division task organization. The DSSB is a headquarters with organic company-level capabilities to support supply, transportation, and maintenance operations. DSSBs have an organic composite supply company, CTC, and a support maintenance company. The DSSB can expand its capability by task organizing up to three additional logistics companies, detachments, or teams. The DSSB conducts field maintenance, transportation, supply, human resources, financial management, personnel services, distribution management and operations, and operational contract support requirements determination in coordination with subordinate units and the division staff. For additional information on the DSSB, see ATP 4-91 and FM 4-0.

Division Sustainment Support Battalion

Role: Provides command and control to all subordinate units and plans, synchronizes, and integrates sustainment support (including medical) for the division.

Capability: Provide command and control for up to seven companies.

Command relationship: Organic to the DSB.

Support relationship: General support to units in the division task organization.

Appendix B

Preventive Maintenance

Transportation units cannot conduct their mission with non-mission capable equipment. Preventive maintenance in accordance with the vehicle operator's manual can greatly reduce common problems with motor vehicles. Leaders should supervise preventive maintenance and ensure Soldiers understand the importance of operator-level preventive maintenance. This appendix discusses preventive maintenance responsibilities and should be used as a guide for company leaders and equipment operators.

RESPONSIBILITIES

B-1. The objective of preventive maintenance is to avert equipment failure by finding and repairing minor problems before major defects occur. The company commander is responsible for the preventive maintenance of unit equipment. The company commander can disseminate maintenance responsibility, as an additional duty, to a subordinate officer. Preventive maintenance requires the use of POL and hazardous materials, and it is the commander's responsibility to ensure proper actions are taken for environmental concerns. The commander should implement policies and procedures to cover the proper storage of POL products, disposal, spill response, and compliance with applicable environmental regulations.

B-2. Platoon leaders, aided by platoon sergeants and squad leaders, are responsible to the company commander for supervising preventive maintenance, providing technical advice and assistance to operators performing preventive maintenance, and reporting required repairs that are beyond the scope of preventive maintenance. The equipment operator is responsible for conducting required preventive maintenance on assigned equipment. When possible, all operators should be permanently assigned to their equipment and no one else should operate the equipment except in an emergency.

PLATOON LEADER

B-3. The platoon leader is responsible for the maintenance of assigned platoon equipment. This includes the platoon's weapons, protective masks, communications equipment, rolling stock, and ground support equipment. The proper implementation of a strict preventive maintenance program is imperative, as failure will severely impact unit readiness. Although it may seem daunting to establish a maintenance schedule that covers all assigned equipment, it can be completed by establishing priorities and understanding the requirements for each piece of equipment.

B-4. To be successful in maintaining assigned equipment, the platoon leader should delegate supervisory responsibility for preventive maintenance to the platoon sergeant and the squad leaders. Responsibility for assigned equipment should be designated to the lowest level to foster a sense of ownership within Soldiers. The platoon leader should know how to perform preventive maintenance and conduct inspections. The platoon leader should have operators present during technical inspections and ensure operator maintenance is complete prior to equipment undergoing field-level maintenance from the maintenance platoon. In addition, platoon leaders should have operators assist mechanics during scheduled or unscheduled field maintenance to gain a better understanding of the piece of equipment and to expedite its service or repair.

OPERATOR

B-5. Operators conduct preventive maintenance using the -10 technical manual. The technical manual is specific to each type of equipment and gives information needed to find and fix problems discovered during preventive maintenance checks or equipment operation. It lists possible problems, explains what may cause them, and suggests how to correct them. Problems not covered in the -10 technical manual should be reported to unit maintenance. Preventive maintenance performed by the operators includes cleaning, inspecting, servicing, preserving, and lubricating. Preventive maintenance also includes making minor replacements which can be accomplished with basic issue item tools. Operators perform preventive maintenance checks

and services before, during, and after operations. Periodic services are also conducted to ensure equipment is mission capable.

BEFORE OPERATIONS

B-6. Operators perform services prior to operating assigned equipment. The service includes checks and services done at the start of each day's operation, in accordance with the -10 technical manual for the piece of equipment. Checking the equipment prior to operation ensures the equipment is safe for use, fully functional, has no dead-lining faults, and that no major damage has occurred since the last service.

DURING OPERATIONS

B-7. Operators also perform services while operating equipment. This service mainly includes observation of the equipment during use by monitoring vital gauges and listening for unusual noise. The operator can look for malfunctions while operating the equipment and correct them if possible. Operators report faults upon return of the equipment. If the equipment sustains a malfunction unable to be corrected and can further damage the equipment or personnel, the operator should immediately cease use and report the deficiency.

AFTER OPERATIONS

B-8. Upon completion of a mission, the operator should perform an after-action service as required in the technical manual. This type of service includes an inspection, cleaning, and refueling. If faults are identified, the operator should report deficiencies on the appropriate maintenance worksheet and to the supervisor.

SCHEDULED SERVICE

B-9. Maintenance personnel assigned to the maintenance platoon conduct equipment maintenance services in accordance with the appropriate technical manuals as outlined in the Optimized Equipment Service Plans. Operators assist maintenance personnel in the conduct of services. Assisting the maintenance personnel enables the quicker return of equipment and increases the operator’s knowledge of the equipment.

Note. For information containing details on forms and records used to document maintenance services (manual), see DA Pam 750-8. For the Army’s Maintenance Management Information Systems (Ground), see ATP 4-33.

B-10. As autonomous and predictive logistics capabilities enter formations, leaders must include preventive maintenance checks and services of sensors and antennas as part of their key services.

Appendix C

Occupation and Organization of the Truck Company Area

Motor transportation companies may establish truck company areas to execute missions, conduct company operations, and maintain security. The characteristics of large-scale combat make it unlikely that a truck company will remain in a truck company area for an extended period. Units should move to maintain responsive support and to enhance survivability. Understanding the requirements for a truck company area, and how to organize and operate one, are imperatives for success. A unit's TSOP should cover all aspects of displacement, from triggers of displacement to load plans.

TRUCK COMPANY AREA REQUIREMENTS

C-1. There are many variables to consider when determining where to establish a truck company area. The following are considerations for basic area requirements:

- **Road networks**. Proper road networks are essential to a transportation unit's mission. Road networks should provide accessibility and accommodate vehicles of various sizes and weights. Consideration should also be given to locations of the road networks relative to the main and alternate supply routes. When choosing a truck company area, be aware that tractors (for example, M915, M1088) or coupled semitrailers may be damaged if crossing ditches.
- **Size of the area**. Motor transportation units need large areas to accommodate a truck company with numerous vehicles and trailers. There should be enough room to safely park and maneuver equipment within the site and provide sufficient space for a convoy staging area. Leaders must also understand the requirements for setting up the sleep area and employ environmental stewardship protection program procedures.
- **Defensibility**. Protection of personnel and equipment is vital. Intelligence reports regarding local enemy threats should be considered when choosing a truck company area. If possible, the site should also provide some level of concealment.
- **Terrain**. The truck company area should provide enough flat, open area to stage vehicles. It should also have sufficient drainage and not be in lowlands to prevent the risk of floods from hindering operations.
- **Existing facilities**. The use of existing facilities will significantly decrease time spent on establishing a new truck company area. Using existing facilities will accelerate both occupation and organization for the headquarters and it may decrease costs.
- **Local directives**. Host-nation laws or local policies may determine where a company may or may not be allowed to locate. When required, the commander ensures coordination with appropriate agencies is conducted prior to occupying a truck company area.

C-2. Figure C-1 on page 36 provides an example of a motor truck company layout (the figure is not to scale). The actual layout is determined by the operational environment and the tactical situation. A TSOP should also be used to illustrate a layout. For additional information on occupying an operational area or establishing a command post, see ATP 4-90, ATP 4-91, ATP 6-0.5, and FM 3-90.

Note. Geospatial engineering capabilities can provide an evaluation to include geographic location and characteristics of natural and constructed features and boundaries of the planned AO. Geospatial data and information from the evaluation can help inform the process of determining basic area requirements specifically for road networks, size of area, terrain, and existing facilities. See ATP 3-34.80 for detailed information on Army geospatial engineering functions.

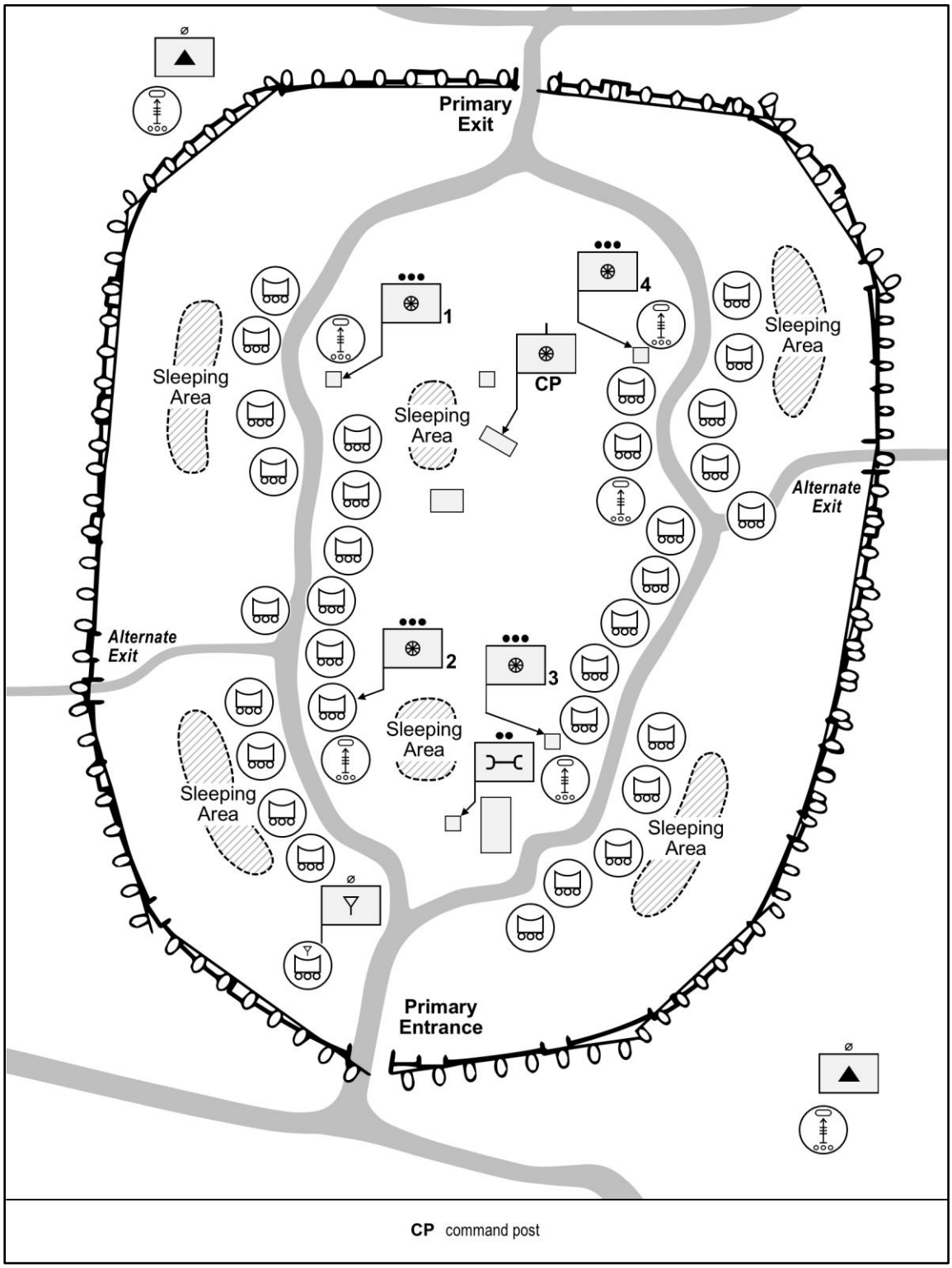


Figure C-1. Possible layout of a company area

POSITIONS

C-3. Optimizing available space, fields of fire, communications, accessibility, and survivability are integral aspects in selecting positions. Each element within the truck company area should be located where it can operate most effectively. Considerations for select elements in the area include the following:

- **Command Post**. The command post is centrally located within the perimeter where it can exercise command and control over the company, remain well-defended, and have lines of communications with sub-elements.
- **Operations**. The operations section, including the operations officer, truckmaster, and dispatcher are centrally located and adjacent to the command post to allow accessibility for unit leaders.
- **Maintenance**. The selection of the maintenance location depends on its accessibility to entry and exit routes. The area should be located within the perimeter and near the entrance to simplify operations for maintenance personnel. The maintenance area within the company area should have an entrance and exit within the perimeter.
- **Petroleum**. Fuel tankers and tank and pump units should be located adjacent to the primary entrance, inside the perimeter, to effectively provide retail distribution to returning vehicle platforms. A distribution network design is essential to optimize retail distribution and avoid congestion. Secondary containment systems are necessary to contain spills. Fuel tankers should be positioned away from field feeding areas and water points.
- **Platoon Areas**. The number of platoon areas is dependent upon the number of platoons within the company and consists of two areas: the troop area and the vehicle area. The troop area consists of the platoon headquarters and the designated areas for sleeping. The vehicle area is the location where vehicles are parked or staged, camouflaged, and where operator maintenance is conducted. Vehicles should not move within the company area without ground guides, especially in proximity of sleeping locations.
- **Field Feeding Operations/Facilities**. Transportation units have limited numbers of cooks assigned, and they are usually detached to another unit to establish a consolidated dining capability. Units will either go to the consolidated dining facility or have food delivered to the unit area. When preparing meals at the company location, the field feeding area should be centrally located within the perimeter and away from interior roads to avoid contamination. It should be adjacent to the water point, have hand-washing stations, be at least 90 meters away and uphill from latrines, and at least 500 meters from any fuel point. The serving lines should take advantage of available cover and concealment.
- **Latrines**. Latrines are located on the downwind side of the operations area at least 90 meters from the water supply, and close in proximity to all Soldier sleeping areas. The latrines should be able to accommodate at least eight percent of the unit at a time and planners should ensure there are sufficient male and female latrines. Hand-washing facilities should be located near the exits.

DISPERSION

C-4. Dispersion of vehicles in a truck company area is dependent on the operational environment. Motor transport companies and their leaders must anticipate being under continuous visual, electromagnetic, and influence contact with adversaries during operations. Peer adversaries will deploy persistent visual surveillance through space and other capabilities to detect and target logistics operations.

C-5. During competition, enemy forces can employ multiple methods of collecting on motor transport units to develop an understanding of capabilities, readiness status, and intentions. Enemy forces can do this inside and outside the continental United States. They can also employ space-based surveillance platforms to observe unit training and deployment activities.

C-6. During crisis and armed conflict, the enemy can employ networked land, maritime, air, and space-based capabilities to detect and rapidly target motor transport units with fires. Motor transport units that are concentrated and static for extended periods are easy for enemy forces to detect and destroy. Dispersion provides survivability and increases opportunities to use cover and concealment.

PLANNING A COMPANY MOVE

C-7. Truck companies move often, and the commander should establish and publish SOPs for unit moves. When a transportation unit receives a movement warning order, the unit commander initiates actions to prepare for movement. First, the commander conducts a mission analysis and initiates troop-leading procedures. A map reconnaissance is conducted to determine time-distance factors. During this process, the commander gathers relevant tactical information.

C-8. The commander issues a warning order to the company to include the reconnaissance party officer in charge (OIC) and key leaders. The reconnaissance party OIC performs detailed map reconnaissance and begins development of strip maps of primary and alternate routes and distributes these maps to key leaders. After completion of route and site reconnaissance, the commander may issue a fragmentary order based upon information obtained. Tentative future positions may then be identified for each platoon or section.

C-9. The unit begins preparations to clear the area as soon as it receives the movement warning order; this can occur while reconnaissance is being conducted. The procedures used to clear the area vary based on the situation. During a company move, the unit will continue to provide transportation support unless it is released from its mission. Leaders should be aware of ongoing missions, vehicles out on missions, and ensure the unit movement plan includes the disposition of non-operational vehicles. The evacuation of non-operational vehicles should be accomplished as the situation permits. Perimeter security should not be compromised in the preparation for movement.

C-10. While loading vehicles in preparation for the unit move, vehicles should be packed in reverse order so the most essential equipment will be off-loaded first. Non-mission essential equipment (including individual clothing) is packed first, and then essential items. Proper loading and tie-down procedures are necessary to secure loads during transit (see appendix E for more information). Once the main body is prepared to depart and vehicles are staged, the entire area should be inspected. The inspection ensures equipment was not overlooked, garbage is properly disposed of, and items that could provide information and intelligence are not left to be discovered by enemy forces.

METHODS OF OCCUPATION

C-11. When a company is issued a movement order, it is critical to keep move time to a minimum to limit exposure and risk. The occupation of a new location poses risk, as the new area is unfamiliar and most likely unsecure. Therefore, TSOPs are essential to unit preparations and procedures for occupying a new AO. The commander employs a quartering party or an advance party to assist in the occupation of an assembly area. A *quartering party* is a group dispatched to a new assigned area in advance of the main body (FM 3-90).

RECONNAISSANCE PARTY

C-12. At a minimum, the unit commander conducts map reconnaissance before employing the reconnaissance party. The reconnaissance party's objective is to select the best location for the unit. The reconnaissance party will also provide information to the commander for the selection of routes and sites to facilitate orderly, rapid, and safe movement and emplacement at the designated location.

C-13. The composition of the reconnaissance party is governed by tactical concerns and is at the discretion of the commander. The reconnaissance party usually consists of an OIC, truckmaster, and a security team, but it can also include other key leaders in the unit. The reconnaissance party determines the acceptability of proposed sites and makes recommendations to the commander. Site selection is based on defensibility, size, and proximity to a capable road network. The team must be prepared, equipped, and trained to conduct the reconnaissance under full mission-oriented protective posture conditions.

QUARTERING PARTY

C-14. A quartering party is generally used when the commander has sufficient warning of a move or when the company is moving as part of a larger unit. An OIC directs the teams that carry out the specialized activities of the quartering party. The OIC has overall responsibility for the quartering party and for its detailed layout. The OIC ensures the party is properly briefed and verifies the acceptability of the new position.

C-15. The NCO in charge assists the OIC and ensures that specific teams execute their assigned missions. The NCO in charge ensures the new position is properly cleared of mines and is secure prior to entry by the quartering party element. The NCO in charge ensures that quartering party members have local security, that they conduct a chemical and radiological survey, and that the parent unit is notified as to the acceptability of the new site.

C-16. The unit TSOP establishes the composition of the quartering party. The local threat determines the number and types of teams necessary to clear and secure an area. Individuals may be on more than one team, and some teams may have concurrent missions. Teams should be proficient in operating the equipment necessary to perform their functions. At a minimum, the following teams should be established:

- **Security Team**: The organization of a security team is vital to the safety of the quartering party. Everyone is a member of this team until the area has been cleared and an observation post is established. The observation post may be in the form of hasty defensive positions placed in the four cardinal directions or along likely avenues of approach. If needed, security patrols augment the observation posts and act as a quick reactionary force.
- **Chemical, biological, radiological, and nuclear (CBRN) Specialist**: This member of the security team employs chemical alarms and conducts readings of the area.
- **Minesweeping Team**: This team also augments the security element, operating mine detectors if authorized as part of the initial clearing of the proposed area.
- **Ground Guides**: Ground guides assist in a smooth initial occupation by establishing parking and staging areas, and they are the team members designated to meet their units at the dismount point upon arrival. Prior to the arrival of the main body, these personnel assist the OIC and other teams with the layout of the site or other duties determined by the quartering party leaders.

C-17. If the quartering party encounters enemy forces en route to or at the new location it should break contact. The OIC advises the commander of the situation as soon as the tactical situation permits. The commander will issue a fragmentary order directing movement to an alternate position or to a rally point. If chemical or radiological contamination is present, the quartering party should move to a designated point, notify the commander, and request necessary decontamination.

Equipment

C-18. The quartering party should have equipment sufficient to successfully accomplish the reconnaissance, layout, and security of the new position. The quartering party requires cargo vehicles with sufficient communications capability to maintain contact with the main body. A radio-equipped vehicle can operate as the quartering party command post, or the OIC can utilize other available equipment to effectively command and control the party. Sufficient crew served weapons, ammunition, class IV materiel, and mine and chemical detecting equipment are necessary for the quartering party to execute its duties. The quartering party should also ensure sufficient class I and III products are available for the duration of their assigned mission.

C-19. The OIC may use marking stakes for planning the location of unit elements within the area to expedite occupation during the main body entrance. Maps and other information about the area identified during reconnaissance are important to identify obstacles, avenues of approach, key terrain, observation and fields of fire, cover and concealment, and supply routes.

Reconnaissance

C-20. The quartering party OIC conducts three types of reconnaissance: map, route, and site. Upon receipt of the movement warning order, the OIC conducts a map reconnaissance to identify the primary and alternate routes to the new location, clearances for routes, bridge classifications, route trafficability, roadway width, checkpoints, rally points, and other key information. The map reconnaissance facilitates the OIC's development of a tentative plan for the unit move.

C-21. Route reconnaissance is conducted either before movement to the new position or en route to the new position based on the tactical situation. The OIC adjusts the tentative plan developed during the map reconnaissance and designates checkpoints and rally points. Checkpoints and rally points are easily identifiable terrain features or markers. Checkpoints are used as command and control measures to gauge unit movement. Rally points are places where units can reassemble and reorganize if they become dispersed.

A rally point should be large enough for the entire main body and away from supply routes. A rally point should have cover and concealment and be defensible for a short period.

C-22. Conducting a site reconnaissance prior to moving the main body is ideal if the tactical situation permits. To execute a site reconnaissance, two security team members use the mine detector to clear the access road, and two personnel conduct a radiological and chemical survey. The entire team then moves tactically to the new site looking for signs of enemy activity. Upon reaching the new site, the quartering party OIC establishes security by emplacing observation posts along likely avenues of approach to provide security for the entire element. The leaders also establish security patrols (mounted or dismounted) and then begin a thorough site reconnaissance.

Plan the Occupation and Prepare Positions for Occupation

C-23. The quartering party OIC confirms the layout of the new site, designates ground guides, and ensures ground guides emplace markers to designate subordinate unit areas. The OIC updates all members of the quartering party of changes to the original order, deviations to the unit SOPs, the order of march, rate of march, and the approximate arrival time of the main body.

ADVANCE PARTY

C-24. The company commander designates an advance party to occupy and prepare the site for future occupation by the main body. The advance party typically consists of the first sergeant, assistant truckmaster, CBRN NCO, a senior wheeled vehicle mechanic, and added troops for labor and security. Troops assigned to the advance party are assigned specific tasks. The makeup and size of the advance party is governed by the tactical situation, the amount of work required in preparing the site for occupation, and other considerations deemed appropriate by the commander.

C-25. The advance party expands the perimeter of the new location by clearing and securing the site beyond what was completed during the reconnaissance. Troops are divided into fire teams that search the area for hazards, monitor for CBRN contamination, gather information and intelligence, and look for signs of enemy activity. Security patrols and observation posts continue to provide early warning and protection.

C-26. During the advance party, the company confirms the locations of the company and platoon command posts and establishes communications. It also confirms platoon and maintenance section areas and other appropriate sites for necessary company functions. Roads and trails that allow for one-way traffic are selected. Alternate exits are selected and marked to allow emergency departure if the main exit becomes blocked. Individual parking areas are selected based on capacities for assigned equipment, including vehicles and trailers. After selecting future sites, platoon representatives thoroughly reconnoiter their assigned area and initiate setup.

C-27. As the main body of the company arrives, vehicles rapidly clear the approach route and are guided into predetermined positions. Drivers should quickly camouflage their vehicles and then establish hasty fighting positions on the perimeter, providing security for the entire unit.

MAIN BODY

C-28. The unit is extremely vulnerable to enemy attack during the initial occupation of the main body. When the main body arrives at the new location, a ground guide meets each major sub-element and leads it to its location. All vehicles move off the MSR and access road into the position area as quickly as possible, maintaining intervals if possible. Once the main body arrives, the unit focuses all its efforts on rapidly establishing a defensive perimeter, camouflaging, establishing internal communications and communications to higher headquarters, and starting operations. The unit establishes work priorities and unit personnel are given specific tasks, including establishing a defense perimeter with any class IV available.

OPERATING IN AN URBAN ENVIRONMENT

C-29. Truck companies may be required to operate from urban areas. While the basic principles of occupying these areas remain the same as for rural areas, there are significant differences. Commanders identify civil considerations and try to mitigate any harm or negative effects their operations have on the civilian population. They should use an established civil-military operations center to coordinate and help deconflict

spaces to protect operational security and deconflict use of logistics pathways and facilities. Among these differences are the way vehicles and equipment are positioned and camouflaged, the impacts of operating in a confined area, and controlling civilians.

UNIT OPERATIONS AREA

C-30. The unit operations area should contain a minimum of two entrance routes and two exit routes, sufficient parking areas for tactical dispersion, camouflage of vehicles and equipment, and a maintenance area. Normal unit security measures should be modified for urban environments. Factors include the nature of the terrain, presence of existing facilities and buildings, and the possible presence of civilians.

OPERATIONAL CONSIDERATIONS

C-31. With a few modifications, the procedures for setting up an operations area in urban terrain are like those used in rural terrain. Transportation units are usually not alone in urban environments as civilians usually remain in the area. The fact that civilians are in the area should be considered when planning and executing mission support. Close coordination with nearby units in the area and the local populace is essential to prevent breeches of security.

BILLETING

C-32. The physical layout of urban terrain allows for billeting Soldiers and concealing vehicles with limited use of tents or camouflage screening systems. The decision to pool or disperse is dependent upon mission variables. Preexisting billets should give adequate protection and, ideally, all billets should be in the basement to protect troops from aerial or artillery attacks. Windows should be covered to prevent entry by enemy forces and to protect against shattered glass.

VEHICLES

C-33. The best method of camouflaging vehicles and pieces of equipment is to store them inside buildings or existing facilities. If building contents should be moved outside to make way for unit vehicles and equipment, ensure that the contents fit the surroundings and do not draw undue attention. Whenever possible, limit visibility of assigned equipment and do not permit vehicle engines to run inside buildings without adequate ventilation.

SECURITY

C-34. Operating in urban terrain and near local civilians increases the possibility of security compromise. The degree of security depends on the available security resources, type of urban terrain, and extent of terrain occupied. Security precautions should be taken against the use of sewers or interconnected cellars by infiltrators, saboteurs, and various types of improvised explosive devices. Commanders should use military police or host-nation police (when possible) to augment unit internal security. Buildings also offer good visibility for likely avenues of approach and are ideal locations for observation posts. For more information on area security, see ADP 3-37.

C-35. The perimeter defense should be organized for both ground, indirect, and air threats. Fighting positions should be identified and constructed, including bunkers to protect from indirect fire. The best defense technique in an urban operations area is concealment.

COMMAND POST

C-36. The company command post should be centrally located inside the perimeter to provide the most effective means to exercise command and control. The building should be well constructed and large enough to accommodate the quick reaction or reserve force during periods of increased security. Take all measures to conceal the command post position, including antennas or other visible communication systems, and limit the number of vehicles or other identifiable equipment surrounding the command post. Preexisting electrical power from the area may be present; however, generators should be prepared, utilized, and maintained to provide an effective means of power.

FIELD FEEDING OPERATIONS

C-37. The dining facility should be positioned centrally, but not next to the command post. Consider using existing civilian dining facilities if available. Also, consider putting the mobile kitchen trailer inside a building and operating from that location. The location chosen should accommodate the number of assigned Soldiers and provide adequate concealment.

UNIT MOTOR PARK

C-38. Organization of the motor park is one of the most important factors in motor transport operations. The following will discuss basic characteristics and considerations for tactical motor parks. In planning for a unit motor park, always plan for the most efficient and economical use of available facilities, while constantly improving site location as operating conditions change.

C-39. The company commander has overall responsibility for the unit motor park. As the commander's operations assistant, the truckmaster supervises the motor park and is responsible for the efficient conduct of related activities. Unit commanders establish procedures for the controlled dispatch of vehicles after duty hours.

LOCATION

C-40. The unit commander must select the best possible site in the AO for the motor park. The truckmaster reconnoiters the area and recommends the location of the motor park to the unit commander. The truckmaster bases this recommendation on interoperability, terrain, enemy considerations, size, and existence of facilities.

Intermodal Support

C-41. The unit's mission is the key consideration in selecting the tactical motor park site. It should be located as close as possible to depots, railheads, terminals, or other facilities that require truck support to maximize interoperability. The tactical motor park can be collocated with aerial ports of debarkation, seaports of debarkation, or railheads depending on the assigned mission. Easy access routes, all-weather roads, and separate entrances and exits to the area are all highly desirable to maximize the effectiveness of interoperability.

Terrain and Enemy

C-42. The location should have good drainage and stable soil or hardstand with little danger of fire. Abandoned schoolyards, factory storage areas, or recreational areas are ideal if the tactical situation permits their use. Make use of natural obstacles and use artificial camouflage materials to augment natural foliage. Considerations for the location of a unit motor park should heavily depend on enemy composition, activity, and capability. Planners should carefully consider dispersion, concealment, overhead cover for vehicles, and the ability to secure the motor park against enemy attack or cargo pilferage.

Size

C-43. The motor park site should be large enough to accommodate unit vehicles, tentage, maintenance facilities, POL storage, and any other assigned unit equipment. The selection of the site should be large enough for equipment, but not so excessive that it degrades internal security measures.

Existing Facilities

C-44. The motor park should be located near permanent buildings when possible, especially when the position will be occupied for an extended period. Prior to use, abandoned buildings should be inspected for structural flaws, enemy presence, and sanitary conditions.

C-45. The dispatch office should be located at the motor park exit when possible. The operations office and drivers' briefing room should be in the same building. This allows the dispatcher to look at departing vehicles and to give final instructions to drivers when necessary. The truckmaster and dispatcher should be located

together for easier control over vehicles. Individual units rarely choose their buildings or location, so it is essential to make the most effective use of the facilities available.

TRAFFIC PLAN

C-46. The motor park traffic plan should be designed to maximize the effective use of existing facilities. Local conditions will determine the exact details of the traffic plan, but it should be clearly marked and labeled to prevent congestion. Vehicle traffic should be one-way in order to simplify vehicle movements. The traffic plan should prevent vehicles from crossing the maintenance shop aprons when entering, leaving, or maneuvering in the motor park. The entrance lanes should be established to provide easy access to POL, water, and the field feeding section.

SECURITY

C-47. Guards normally provide perimeter security for the motor park. This includes guards at the entrance and exit gates. The unit commander who occupies the motor park should ensure that auxiliary gates in the command area are locked and the fence is secure. The unit commander should also provide security for classified cargo, government property within the area, and for staged loaded vehicles. The commander should also designate and secure an area for parking dangerous loads and implement a key control program according to security directives. Follow appropriate security measures according to unit SOPs when host-nation vehicles are incorporated into convoys.

COMMUNICATIONS

C-48. Reliable communications with the company command post simplifies motor park operations. Communications speed the transfer of information on routine matters as well as alert notices and other emergencies. Field phones, radios, or digital communications can be used to connect the motor park and the command post. Units should not rely on commercial telephone circuits as their use is unreliable; they are an alternate means of communication for daily operations.

FIRE PREVENTION

C-49. Fires in motor parks are usually caused by hazardous operations, including carelessness or unsafe use of maintenance equipment near flammables. Units should have adequate fire protection equipment available, and Soldiers should be trained on that equipment to mitigate the risk and reduce the effects of fire. Soldiers should also be trained on fire prevention techniques.

C-50. Smoking areas must be designated and placed away from fuel pumps, POL storage, and other flammable areas as required by specific policies and procedures. To maintain safe operations in the maintenance facility, use separate containers for the disposal of waste POL, place oily rags and trash in covered metal containers, and mark all containers appropriately. A fire marshal should conduct periodic checks of the motor park to ensure safe operations.

ENVIRONMENTAL PROTECTION

C-51. It is essential that environmental protection procedures are established and followed in unit motor parks. POL and hazardous materials should be stored correctly, including secondary containment systems to contain spills. Maintaining a spill response SOP and materials is imperative in quickly reacting to environmentally hazardous spills. It is also important to plan for proper waste storage and disposal, ensuring it is correctly contained prior to removal. The commander should designate an environmental representative to conduct periodic inspections for compliance with environmental practices.

EMERGENCY EVACUATION

C-52. Motor parks may be prime targets for enemy aircraft or indirect fire. Upon receipt of attack warning, vehicles and personnel evacuate to the dispersal area over previously selected routes. Rapid evacuation of the motor park may not be possible using regular exits. By designating emergency exits, commanders can facilitate evacuation and reduce traffic congestion. These exits may be gates that are secured during routine operations or areas where the fence may be temporarily removed. Since emergency evacuation may involve different units, the commander should coordinate the evacuation plan. Evacuation priorities should be based on unit missions. The truckmaster should be thoroughly familiar with the evacuation plan and should brief

unit personnel on the order of evacuation, assigned exits, and routes to an alternate motor park or designated rally point.

Appendix D

Road Network Evaluation

Road network evaluation is more than a review of the road network, surface treatments, and bridge capacities. It encompasses all aspects of sustainment preparation of the operational environment such as friendly and enemy activity, weather, and terrain. This appendix addresses factors that should be considered in evaluating a road network. For detailed information on terrain characteristics, see ATP 3-34.80 and for road networks, see ATP 3-34.40.

MAPS AND OTHER DATA

D-1. Movement planning begins by studying maps of the area that offer general alignment, comparative surfacing, and information on bridges and tunnels. If operations are to be sustained, add data from other sources such as the following:

- Satellite imagery.
- Internet-based mapping programs.
- Topographic maps.
- Aerial photographs.
- Ground reconnaissance.
- Reports of travelers or inhabitants.
- Construction plans of highways and bridges.
- Engineers, military police, and movement control units.

ROAD CHARACTERISTICS

D-2. Road characteristics include elements of design and construction that influence vehicular travel. Turns, including sharp hairpin turns, are particularly found in mountainous terrain and may restrict the use of some larger military vehicles based on turn radiuses. The width of the road determines the size of vehicles and the number of traffic lanes that can be accommodated. Engineers classify routes into three basic types:

- Type X, all-weather.
- Type Y, limited, all-weather.
- Type Z, fair weather.

D-3. The classification of a road is based on the road's ability to withstand weather effects. It considers road surface material, type of construction, alignment, grades, and other features. Route type is determined by the worst section of road on the entire route. See ATP 3-34.81 for methods to measure and evaluate obstacles on routes. All units can use DD Form 3009 (*Route Classification*) for route classifications and DD Form 3010 (*Road Reconnaissance Report*) for road reconnaissance.

D-4. Factors that affect road movement include movement planning factors, graphing, planning for route restrictions, preparing movement tables for highway movement, and road management planning in an area-control environment. Convoy operations are discussed in Appendix G and Appendix H. See ATP 4-16 for detailed information on road movement planning.

MILITARY LOAD CLASSIFICATION

D-5. Military load classification is a load capacity rating system that assesses the effects of vehicle weight and type upon roads and bridges. If the military load classification is greater than the classification of the weakest bridge on the route, the bridge classification determines the capacity of the route. Wheeled and tracked vehicles with the same weight have different military load classification values. There are tables in ATP 3-34.81 and NATO Standardization Agreement 2021 that convert vehicle capacity in pounds and factors such as number of axles and distance between axles to an equivalent military load classification. The entire road network's classification is determined by the minimum load classification of a road or a bridge within the network. Vehicle loads and cargo loading are addressed in appendix E. The broad categories are:

- Class 50, average-traffic route.
- Class 80, heavy-traffic route.
- Class 120, very heavy-traffic route.

OBSTRUCTIONS

D-6. Obstructions are natural or manmade obstacles, or a combination of the two (including obstacles created by enemy action), that hinder or stop movement over a given section of road. Obstructions are critical points that include—

- Reductions in overhead clearance. Look for overhead wires, low overhanging tree branches, overpasses, underpasses, clearances, bridges, and tunnels.
- Reductions in road width. Look for narrow tunnels and bridges and overhanging or encroaching buildings.
- Reductions in road capacity. Look for bridges, fords, or ferries having less capacity than the road.
- Steep grades (7 percent or greater) and sharp curves (radius less than 25 meters).
- Weather restrictions, such as fog, flooding, ice, snow, and mudslides.
- Contaminated or damaged areas.

CLIMATE AND WEATHER

D-7. Climate is a condition produced by temperature, humidity, precipitation, wind, and light in an area over an extended period. Climate influences long-range plans for an AO. The weather is a day-to-day condition of the atmosphere and should be used to assess daily operations. Extremes of climate and weather impact motor operations by their effects on personnel and equipment. Cold climates reduce the efficiency of personnel. Bulky clothing limits movement in performing maintenance and operational duties. Hot, humid climates reduce energy and increase physical discomfort and the likelihood of disease. Over time, heat and high humidity reduce the life expectancy of all equipment and add to the problems of maintenance, repair, and replacement. Rust and corrosion are also accelerated in this type of climate. Mildew and rot rapidly attack unprotected clothing and leather products.

D-8. Weather extremes affect the daily maintenance and operation of motor vehicles. Low temperatures require protection of cooling systems to prevent freezing and protection to make starting easier. Tire life may be reduced, and metals may become brittle and break. Batteries lose efficiency and may freeze or crack. Severe freezing may require extensive road repairs after each thaw, particularly in early spring. Extremely high temperatures may increase the number of breakdowns from overheating. For additional information on cold weather maintenance, see TM 4-33.31.

TERRAIN EVALUATION

D-9. The climate and terrain should be considered together, as their greatest effect is on off-road or cross-country motor movement operations. Terrain evaluation is the study of how soils, vegetation, climate, and landforms help or hinder the employment of military units and equipment. Road movement planners evaluate terrain to determine the ability to move vehicles and equipment without interruption and with minimum exposure to observation and direct fire.

D-10. The terrain evaluation considers all factors of the operational environment in relation to the capabilities and limitations of the equipment. In all military motor transport operations, terrain evaluation should be done for every new mission. The source of information, the techniques, and the results of terrain evaluation vary with the operational environment. The terrain evaluation at unit level is made to select the most suitable route to accomplish the mission most effectively under the circumstances.

D-11. A terrain evaluation is based on information gained from observation and ground reconnaissance, aided and expanded by maps, photos, and local intelligence. Leaders need to carefully weigh this information against known capabilities and limitations of the vehicles and the training or experience of the drivers. The weather, rather than climate, is the most important variable. Even in a well-developed area with a good road network, a driver may be required to make an off-road detour to bypass a roadblock or section of damaged

highway. The habit of constant terrain evaluation enables drivers to make a quick decision and prompt selection of the most practical route.

COMBINED EFFECTS

D-12. The combinations of terrain, climate, and weather usually cause the adverse conditions for motor vehicle operation and military motor movement. The effects of climate on terrain include the amount of vegetation, frequency of precipitation, moisture content of soils, and size of water obstacles.

D-13. Weather conditions may reduce highway speeds, increase congestion, and be a major cause of accidents. Fog, rain, snow, ice, and high winds restrict movement on highways as well as cross-country. In planning off-road movement and movement on unimproved roads and trails, consider the type and character of soils along with climate and weather. Vegetation may serve as an indicator of soil type and trafficability. It may also be an obstacle to movement even though it provides cover and concealment. Soils are made up of disintegrated rock in the form of sand or clay (structure) and disintegrated organic material (humus). Their capacity to support traffic depends on both structure and the amount of moisture present. The snow characteristics are also included since the effects of snow on motor movement are considered in the same manner as soil effects.

SOIL

D-14. The condition of the soil is important when planning for off-road movement. Normal topsoil is a mixture of clay, silt, or sand and decomposed vegetation; mud is clay and silt. All soils containing large amounts of these substances will become soft and pliable when wet. Silty soil will become dusty and loose when dry. Clay soil will dry hard and firm, making a good road surface, but may become powdery during heavy use. The rain has little effect on silty soil but may make clay roads greasy, reducing trafficability. Steep grades on terrain may make routes impassable during certain weather conditions.

SAND

D-15. There are two types of sands to consider during road movement, fine and coarse. Fine sand gives excellent support and traction when firmly compacted and dampened. Coarse sand does not compact well; it will dry rapidly and will present an obstacle during motor movement.

SNOW

D-16. The effects of snow are unpredictable and vary with temperature changes. Trafficability in snow depends on its strength, traction, and resistance. Light, new-fallen snow up to 20 inches (50 centimeters) deep may offer no serious obstacle to the average military vehicle. However, eight inches of grainy, sand-like snow may make wheeled vehicle operations difficult. In extreme cold, snow has the same traction as dry soil. Near or slightly above freezing temperatures drastically reduce traction on hard-packed snow surfaces.

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Appendix E
Loads and Loading Techniques

To successfully support military operations, motor transport unit personnel must understand the principles of vehicle loads and cargo loading. Appendix E addresses these principles, with emphasis on shipper and receiver responsibilities, hazardous material, oversize and overweight loads, and methods of loading and unloading. For additional information, see TC 21-305-20.

RESPONSIBILITIES OF UNIT PERSONNEL

E-1. All motor transport company personnel have some responsibility for vehicle loads and cargo loading. A discussion of individual responsibilities follows. For specific information on loading, see the vehicle's technical manual.

COMPANY COMMANDER

E-2. The company commander is responsible for the unit and develops training plans for the unit. The commander ensures that company personnel are qualified to operate all equipment and are thoroughly trained in the principles of loading, securing, and transporting cargo. The commander is responsible for the company's training plans that are aligned with individual driver skills, the required mission essential task list, and military occupational specialty training.

PLATOON LEADER AND PLATOON SERGEANT

E-3. The platoon leader and platoon sergeant develop the platoon's training plans based on the commander's training guidance and their assessment of training needs. Plans include both individual and collective tasks. The platoon leader and platoon sergeant also implement company training plans and policies and ensure that squad leaders are qualified. They review driver testing and qualification records and observe driver training. They keep the commander informed of the platoon's level of training.

TRUCKMASTER

E-4. The truckmaster maintains driver qualification records and ensures that personnel are properly trained before being licensed. The truckmaster should be satisfied that training is conducted according to standard and regularly observes driver training. Based on the type of equipment in the unit, load and loading criteria in testing may be incorporated in training. The truckmaster also reviews commitments that involve unusual or hazardous loads and highlights them for the tasked platoon.

SQUAD LEADER

E-5. The squad leader trains drivers to properly load and secure cargo on their vehicles. The squad leader ensures that operators know what they are carrying and that both drivers and vehicles are prepared to move the types of loads specified in taskings. The squad leader also supervises maintenance and ensures that vehicles meet operational standards.

DRIVER

E-6. The driver supervises the loading of the assigned vehicle and ensures that the cargo is properly loaded and secured against movement. The driver further ensures the load is balanced and does not exceed the vehicle capacity as noted on the data plate. The driver uses the vehicle tarpaulin to protect the load from the weather and pilferage. Once the driver accepts the load from the shipper, the driver is responsible for its safe delivery. The driver should not accept an unsafe load and should resolve any dispute before moving.

SHIPPER

E-7. The shipper will normally load vehicles unless the vehicle has a self-loading mechanism (such as PLS) or attached materials handling equipment (such as a crane). The shipper provides all tie-down devices, dunnage, blocking and bracing materials, and special tools required to secure the load. An exception is

loading containers on semitrailers equipped with locking devices. The shipper also prepares any necessary shipping documents.

CARGO CHARACTERISTICS

E-8. The shipper's request for transportation identifies the characteristics of the cargo with its description, dimensions, and weight. Unit operations personnel use this data to plan which vehicles are needed to support the movement. The cargo data is also used to inform drivers of what is needed to prepare for the movement (such as the requirement for a tarpaulin, placards, protective clothing, and fire extinguishers). If transporting hazardous material, this information alerts drivers to prepare vehicles for certain inspections and to verify loading techniques from squad leaders, platoon sergeants, or truckmasters.

CARGO AREA

E-9. The vehicle cargo area is measured in cubic feet. Cargo dimensions should not exceed the dimensions of the cargo area of the vehicle. An exception is made for certain outsize loads where there is an overhang from the sides or tail end. To make efficient use of assets, transportation units should try to maximize the weight and cube of vehicles and send only the number of vehicles that can safely carry the load. Theoretically, a perfect cargo load is one that exactly matches the cubic measurement of the vehicle's cargo area and its allowable weight. For example, if the maximum payload capacity of an M1083 5-ton cargo truck traveling on a highway were fully used, the load (piled no higher than the side racks) would occupy about 242 cubic feet and weigh 10,000 pounds. These conditions are seldom met. The weight, bulk, shape, and compatibility of the cargo, along with road conditions, affect how the vehicle will be loaded.

WEIGHT

E-10. When loading dense cargo such as ammunition or machinery, the vehicle weight limit may be reached before the cargo space is filled. In other words, it may weigh out before it cubes out. In such cases, the load should be blocked and braced to prevent shifting. With most military cargo loads, however, the vehicle will cube out before it weighs out. The weight of most military cargo is usually stenciled on the package and noted on the transportation request. The total shipment weight equals the sum of the individual package weights. If the weight is not stenciled on the cargo, the driver should ask the shipper to weigh it before loading. If this is not feasible, the driver should try to have the vehicle weighed after loading. This will ensure that the vehicle is not overloaded. If the cargo weight (total weight – vehicle weight = cargo weight) exceeds the maximum cargo weight for the vehicle capacity and the anticipated driving conditions, the driver will return to the shipper for resolution.

E-11. When these options are not possible, the driver should require the shipper to provide an estimated weight and annotate the estimated weight on the shipping document. If the driver has doubts about the vehicle's ability to transport the load safely, it should not be accepted.

ROAD CONDITIONS

E-12. Every road can be classified based on its construction. Engineers normally classify roads. Classification includes bridges, tunnels, and other features that limit width, height, or weight. The payload capacity of a vehicle may be too great for existing roads or bridges. Light surface, loose surface, or fair-weather roads may not bear the weight of a fully loaded vehicle. Accordingly, a driver should be familiar with all road conditions and how they affect an allowable payload. For example, an unimproved mountainous road dictates a reduced load compared to a flat hard-surfaced highway. The nature of the road surface may also affect the amount of blocking and bracing needed to secure the load. For additional information on military road classifications, see appendix D of this publication and TM 3-34.48-1.

LOADING PROCEDURES

E-13. Proper loading procedures are essential to safe operations. They also support successful mission accomplishment by ensuring operational economy and efficiency. See AR 385-10 for more information on requirements for transporting passengers in tactical vehicles.

LOADING CARGO

E-14. The amount of cargo that can be loaded lengthwise into a truck varies by truck size and model. The length and width of cargo trucks and semitrailer bodies are listed in TB 55-46-1. If it is necessary for pipes, lumber, or other cargo to hang over the front and rear of the vehicle, the cargo should be blocked to keep the weight off the tailgate. A red flag should also be placed at each end of the load in the daytime (a red light at night) to warn other motorists that the vehicle needs added road space. The amount of overhang allowed varies from state to state and country to country. Units should know local traffic rules.

E-15. There are general rules for loading cargo to ensure the proper distribution of weight and overall safety of the cargo and vehicle. When loading cargo, place heavier items evenly distributed on the bottom and lighter cargo on top to maintain safe weight distributions. Block, brace, and secure cargo with lumber or other materials to keep the load from shifting or falling off the vehicle while transporting. While loading, ensure the load is as low as possible to the vehicle bed, as an unnecessarily high load may make the vehicle difficult to control. While planning for multiple stops and distribution, separate the loaded cargo by destination to facilitate offloading. Also, and if possible, load items of uniform size and weight together to simplify operations. When loading drums or barrels on their sides, their length should be parallel to the sides of the truck and properly secured to prevent rolling. In addition, if the loaded cargo is higher than the top of the cab of the vehicle, measure and record the height of the load. Inform the squad leader or convoy commander of the height of the load.

TROOPS AND EQUIPMENT

E-16. Certain vehicles designed for cargo may also carry troops and enemy prisoners of war. The number of troops carried varies with the size of the truck and duration of the trip. Only authorized individuals may ride in military vehicles. Passengers should stay seated with all parts of their bodies inside the truck, especially while riding in the cargo bed on troop seats. As passengers in the cargo bed, all Soldiers should wear head protection, and the troop safety strap should be utilized during travel. If the tactical situation permits, a tarpaulin should be used to protect Soldiers from weather, but proper ventilation is essential to protect them from exhaust gases. Soldiers should mount or dismount only after the driver or assistant driver has lowered the tailgate and disconnected the troop safety strap. See AR 385-10 for more information on requirements for transporting passengers in tactical vehicles.

E-17. To prevent injury during loading or unloading and if the tactical situation permits, Soldiers should not mount or dismount the vehicle with their weapon. They should pass it to someone already on board or to the person behind waiting to mount and take it back once on board. Likewise, a Soldier should not mount or dismount the vehicle carrying their individual equipment. Once on board, the Soldier should stack their equipment on the bed of the truck or under the seats. The number of ruck sacks or duffel bags that accompany Soldiers will reduce the number of troops that can be loaded on each vehicle. However, loading Soldiers with their personal equipment reduces the risk of lost equipment. Individual equipment not needed on the march may be loaded in separate trucks or trailers. This practice relieves Soldiers of added responsibility and is less fatiguing. It also ensures that, if the enemy attacks, Soldiers will not be burdened with nonessential equipment. Passengers and cargo are never hauled on the same vehicle.

IMPROPER LOADING PRACTICES

E-18. Overloading and underloading and are improper loading practices. Vehicle overloading is a serious concern because it can damage the vehicle and is unsafe. Drivers should not accept loads that are greater than the authorized payload. Though underloading does not affect vehicle operation or safety, it does affect operational efficiency. Underloading requires more vehicles than necessary to do the job. This wastes vehicles and personnel and causes unnecessary expenditures of fuel and lubricants. It also creates added route synchronization and traffic control problems that can affect all highway movements in the area. Underloading a vehicle is acceptable for compatibility purposes only.

TRANSPORTING EXPLOSIVES AND HAZARDOUS MATERIALS

E-19. Hazardous material is a material or substance capable of posing an unreasonable risk to health, safety, and property when transported, as determined by the Secretary of Transportation. Hazardous materials are designated in Title 49 CFR and include explosives, ammunition, flammable liquids and solids, oxidizing

materials, corrosive liquids, compressed gases, poisons, radioactive material, and chemical agents. Vehicles hauling passengers should be separated from any vehicle hauling hazardous cargo.

REFERENCES

E-20. In CONUS, Army vehicles carrying special loads should comply with Title 49 CFR, AR 190-11, and DTR 4500.9-R. When operating overseas, local regulations and policies apply. Refer to AR 190-11 for detailed instructions on hauling arms, ammunition, and explosives. For information on transporting radioactive materials, see AR 385-10. For information on transporting chemical agents, see AR 50-6. For instructions on the handling and storage of hazardous material, see TM 38-410. The proper marking and placement of placards on vehicles carrying hazardous cargo is covered by 49 CFR within CONUS (see 49 CFR, Parts 100-199), or by overseas regulations.

SHIPPER RESPONSIBILITIES

E-21. Any shipper who offers a hazardous material for transportation should describe the hazardous material on the shipping documents. The driver of a motor vehicle containing hazardous material should ensure that the shipping document is readily available in the event of an accident or inspection. At origin, the shipper should inspect vehicles before they are loaded with hazard classes 1.1 through 1.3 ammunition, explosives, poisons, radioactive "Yellow III" material, and chemical agents. Military shippers use DD Form 2890 (*DOD Multimodal Dangerous Goods Declaration*) to instruct drivers transporting hazardous material. The form outlines precautions to take in event of fire, accident, or breakdown. The shipper or transportation officer can add information related to the specific movement. When the shipper uses DD Form 626 (*Motor Vehicle Inspection [Transporting Hazardous & Sensitive Materials]*) each item on the form should be completed. The driver should ensure all deficiencies are corrected before the vehicle is loaded.

RECEIVER RESPONSIBILITIES

E-22. If the destination is a restricted area, the vehicle is inspected before unloading using the DD Form 626. A restricted area is any area to which entry is subject to special restrictions or control for security reasons or to safeguard property or material. An example is an ammunition supply point. Deficiencies should be corrected at the time of inspection if practicable and if necessary for safe delivery to the unloading point. If a correction is necessary but impracticable, proper action should be taken to ensure safe delivery of the shipment. This could include use of ground guides, reduced speed, or escort vehicles. Drivers should get a copy of DD Form 2890 from the shipper or ammunition supply point before departure. The driver should read the DD Form 2890 before departure and ask questions to ensure understanding if necessary.

LOADING AND UNLOADING HAZARDOUS MATERIAL

E-23. There are many general requirements for loading and unloading hazardous materials. The operator should ensure the vehicle is safe to operate and free of fire hazards. By conducting preventive maintenance checks and services, the driver can identify any obvious faults with the vehicle to rectify prior to loading material. The driver should check to make certain there are no exposed wires and clean off excess oil or grease accumulated on the vehicle. The driver should also check the fuel system for leaks. During loading and unloading, the hand brake should be engaged with chock blocks bracing the wheels. The load is required to be inspected during rest or refueling stops and should never be left unattended. During shipment, hazardous cargo should be marked with the proper shipping name, identification number, and appropriate labels per 49 CFR. The placards should also be placed on the front, sides, and rear of the vehicle indicating the appropriate hazard. The driver should ensure the hazardous material is properly loaded and that blocking and bracing methods are used to prevent shifting during transit.

SPECIFIC TYPES OF HAZARDOUS MATERIAL

E-24. Besides cargo that requires DD Form 626 and DD Form 2890, specific types of hazardous material have other requirements that should be met for transporting. Personnel involved should know and observe current safety regulations and policies contained in AR 385-10, 49 CFR, and DTR 4500.9-R as well as in local policies.

Ammunition

E-25. There are specific rules involved with ammunition shipments. When transporting ammunition, personnel should ensure tops of boxes are marked "THIS SIDE UP". As a safety precaution, do not smoke or use open flames within 25 feet while loading, unloading, or transporting ammunition. The engine should be turned off during loading and unloading, and Soldiers should always ensure ammunition is handled with care. Since ammunition is dense, personnel should verify vehicle payload capacity and make certain to never overload the vehicle. Two serviceable fire extinguishers with at least a 10 BC rating should be carried with the vehicle, and vehicle operators need to be fully trained to operate them. Close and secure the tailgate; never load ammunition on the tailgate. While transporting ammunition, do not push or tow a truck also carrying explosives. Always follow a planned route that minimizes exposure in densely populated areas and never park in congested areas. While driving, protect cargo from shifting by not making sudden stops or turns. Never transport detonating caps with other explosives. When transporting artillery ammunition, load the rounds on their sides so that the side of the projectile is parallel with the truck's side, unless they are vertically prepackaged by the ammunition supply point. Fuses, primers, and artillery ammunition can be carried in the same vehicle, but not assembled into complete rounds.

Flammable Liquids

E-26. Personnel should exercise caution while transporting flammable liquids. Never smoke or use open flames within 25 feet of any hazardous material during loading, unloading, or transit. Always turn off the engine during loading and unloading and have two serviceable fire extinguishers with at least a 10 BC rating available for use. Fire extinguishers with a class B rating are effective against flammable liquid fires. Fire extinguishers with a class C rating are suitable for fires in live electrical equipment. Prior to loading, personnel should inspect electrical connections on petroleum semitrailers and filling apparatus to make sure they are properly grounded. Also, prior to loading, remove tarpaulins and properly store them for future use. Personnel should never wear hobnail or metal-cleated boots to prevent sparks from igniting liquids.

Flammable Solids and Oxidizing Materials

E-27. There are special rules to consider while transporting flammable solids and oxidizing materials. The load should be protected from adverse weather and kept dry at all costs. The proper use of tarpaulins and tie downs are vital in the movement of this type of cargo. Personnel should provide ventilation for the load, but not allow it to be subjected to adverse weather.

Corrosive Liquids

E-28. When transporting corrosive liquids, inspect containers for leaks prior to loading and never load containers if a leak is present. Make sure that each container is tightly closed regardless of whether it is full or empty. While transporting batteries, personnel should ensure they are protected from movement and from contacting one another. The battery terminals should also be protected against short circuits.

Compressed Gases

E-29. While transporting compressed gases, ensure that all cylinders are on flat surfaces. The cylinders should be blocked and braced to prevent movement and tied down appropriately. Ensure the engine is turned off during loading and unloading.

Poisons

E-30. During the transportation of poisons, inspect containers to ensure leaks do not exist. Never transport poisons in the same vehicle with food or edible substances.

Radioactive Materials

E-31. Radioactive materials should be handled with care, and packages containing such items should be properly marked with yellow or white labels in accordance with 49 CFR. Prior to loading, ensure the cargo area of the vehicle is free of protruding nails or bolts. Partitions can be utilized in cargo compartments to

separate different packages. Use the separation distance on the total transport index shown on yellow labels. The label also indicates the degree of control the driver should use while transporting cargo. Never load more than 50 transport indexes on one truck, which can be determined by adding all the indexes on the yellow labels. After adding the transport indexes, personnel should verify the separation distance with the shipper to ensure it is properly loaded. Never transport hazard class 1.1, 1.2, or 1.5 explosives with radioactive materials, and never transport personnel in the same cargo compartment. If monitoring for radioactivity is required, the shipper should provide the monitoring device and an individual skilled in its use. The installation transportation office (ITO) should have a copy of the Department of Transportation regulations that govern radioactive shipments.

Chemical Agents and Chemical Ammunition

E-32. Inspect the cargo area for protruding nails or bolts prior to the transportation of chemical agents and chemical ammunition. Personnel transporting these items should carry individual CBRN defense equipment, know proper first aid and emergency procedures, and utilize any protective equipment or clothing provided by the shipper. Operators should also know the signs and symptoms produced by CBRN hazards and proper steps to follow if symptoms occur. AR 50-6 states that qualified technical escorts should accompany shipments of certain categories of chemical surety material.

CARGO COMPATIBILITY

E-33. Shippers are required to identify commodities that should not be shipped together on the same vehicle. If there is any doubt, shippers should consult appropriate references for guidance before the driver transports the cargo. For shipments within CONUS, use Title 49 CFR, Part 177. When operating overseas, rules of the host country apply. The rules of each country transited, as well as international agreements, govern international shipments of hazardous cargo by highway. If drivers have any doubt about the safety of the load, they should contact the nearest transportation officer, MCT, or their unit. In the absence of host-country standards, comply with guidance in 49 CFR.

OVERSIZE AND OVERWEIGHT LOADS

E-34. Civil authorities determine limitations on the weight and dimensions of vehicles using public highways. Restrictions vary considerably for shipments in the United States and in overseas areas. Unit personnel should know the applicable regulations for the area in which they are operating. During combat operations, the movement control headquarters issues instructions for determining oversize and overweight loads. These limitations are established to prevent damage to MSRs and to allow for safe movement of vehicles.

CLEARANCE PERMIT

E-35. The unit or activity planning to move oversize or overweight cargo requests a DD Form 1266 (*Request for Special Hauling Permit*). This form furnishes the ITO with complete information on the cargo and vehicles to be used. The ITO requests a special hauling permit from the authorities. The requesting unit should furnish the type of equipment, cross-weight, axle loads, height, width, length, origin, destination, date, time, and nature of the cargo to the ITO. In addition, while transporting oversized or overweight loads, warnings should be visible on the sides and rear of the cargo or vehicle to warn other traffic. See DTR Part III, appendix F for additional information on oversize and overweight load requirements.

ESCORT VEHICLES

E-36. If transporting an oversized or overweight load, escort vehicles may be required in the front and rear of the load. These vehicles should either have warning lights or be driven with vehicle headlights on. The lead escort vehicle carries a WIDE LOAD FOLLOWS sign on the front. The rear escort vehicle should be equipped with a WIDE LOAD AHEAD sign on the back.

SECURING CARGO

E-37. To secure the load for safe delivery to its destination, the shipper should follow procedures to lash and/or block and brace cargo. The shipper is responsible for blocking and bracing a load. However, since the

driver should deliver the load safely to its destination, some general rules apply to the driver. The operator should block crates, boxes, and barrels to keep them from shifting during transport. Crib blocking can be used whenever possible. The crib blocking does not need to be nailed to the floor or sides if it is placed tightly against the other cargo to secure the lumber. When using lumber for blocking, it should be free of knots and be strong enough to provide a rigid and stable support system for loads en route. If the load requires protection from weather, pad corners of boxes, crates, or other sharp objects to prevent damage to the tarpaulin.

DOUBLE-STACKING TRAILERS

E-38. Problems may arise when stacking one trailer onto another for transport, especially if loading facilities or equipment (such as ramps, loading docks, and gantry cranes) are not available. Several methods can be used to solve these problems. When semitrailers are stacked and shipped as cargo or moved as a matter of convenience, be sure to coordinate with the receiving authority to ensure the shipment can be unloaded. Use experienced drivers when tractors are positioning semitrailers onto or removing them from other semitrailers.

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Appendix F

Motor Transport Equipment Control

Various records and reports are used to control motor transport equipment and analyze unit operations. Appendix F discusses the purpose and disposition of each of these documents.

TRAILER ACCOUNTABILITY

F-1. When a trailer is being moved by multiple units through the distribution system a DA Form 2062 (*Hand Receipt/Shortage Listing*) establishes responsibility for trailers and serves as a receipt for trailers. It is prepared by the unit delivering the trailer. The DA Form 2062 is retained until the trailer is returned to the issuing unit or the unit carrying the piece of equipment on their property book is otherwise relieved of physical responsibility for the trailer. Two copies of the DA Form 2062 are made and distributed as follows:

- Original—used to show acceptance from one convoy commander or individual driver to another convoy commander, individual driver, terminal, or transfer point OIC.
- Second—retained by the driver or column commander.

F-2. Semitrailers, flatracks, and CROPS will be assigned and accounted for in accordance with AR 710-2, AR 710-4, applicable Army regulations, and Headquarters, Department of the Army G-4 policies and procedures.

DAILY YARD CHECK

F-3. The daily yard check is made at a designated hour each day by units responsible for terminal operations. This report provides information on the location of empty and loaded trailers, including the destination of loaded trailers, and shows deficiencies. It is divided into two sections: section 1, empty trailers; and section 2, loaded trailers. Deficiencies are noted in the remarks column and specified by section (1 or 2). This report is forwarded to the operations section of the next higher headquarters.

DAILY OUTGOING TRAILER REPORT

F-4. The daily outgoing trailer report shows all semitrailers dispatched since the previous day's report. It includes the load class, departure time, and destination of each trailer. The report is sent to the operations section of the next higher headquarters along with the daily yard check.

WEEKLY TRAILER LOCATION REPORT

F-5. The weekly trailer location report is completed by the senior motor transport command. It shows the status, by battalion, of all semitrailers controlled by the command. The report may include information on trailer location, length of time at present location, and whether they are loaded or empty. The report is filled out on a specific day each week. Battalion commanders can use the report to determine if, where, and how trailers are being mismanaged or misused and how to optimize efficiency.

CONSOLIDATED OPERATIONS REPORT

F-6. The consolidated operations report is used to analyze unit performance and plan future operations. It is completed daily by each battalion engaged in line haul and forwarded to the senior motor transport command. Commanders use report data to compute unit performance. For example, a commander can compare the performance of one truck company with another. Most entries to the consolidated operations report are taken from truck company reports. Unit averages are figured to the nearest round number (for example, an average of 7.7 would be raised to 8).

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Appendix G

Convoy Control

Convoy control is exercised in two ways: organizational control and area control. This appendix provides details for both and describes convoy elements.

ORGANIZATIONAL CONTROL

G-1. Organizational control is control exercised by the unit executing the motor movement. Effective organizational control requires march discipline. March discipline is essential to the effectiveness of the march column to prevent conflict with other movements in the area. It can only be attained by thorough training, supervision of operations by technically competent leaders, and attention to detail. There are many requirements in maintaining march discipline, including but not limited to—

- Using licensed drivers.
- Managing autonomous distribution platforms.
- Obeying unit SOPs that specify tactics and techniques for movement, immediate action drills, and communications techniques.
- Meeting start point, en route checkpoint, and release point times.
- Following prescribed routes.
- Following traffic regulations, laws, and posted or dictated speed limits.
- Maintaining time and distance gaps.

G-2. March discipline also requires effectively using protective measures, including vehicle intervals, radio discipline, and blackout driving during night convoys. The proper observation and execution of safety policies and regulations is also vital to march discipline. See TC 21-305-20 and ATP 4-01.45 for more information on movement requirements.

AREA CONTROL

G-3. The commander who controls the area and terrain through which convoys move exercises area control. Area control is normally exercised through movement control channels and is known as route synchronization. Route synchronization is planned by the division transportation officer for the division area or the corps transportation office for the corps area. It is supervised by MCTs assigned to the MCB and by the military police for traffic control.

G-4. The division, corps, and theater Army distribution network designs and route synchronization plans specify the control measures applied to MSRs. Convoy commanders are responsible for ensuring they follow policies in areas through which they will pass. Controlling traffic in an AO is difficult, even under the best of conditions. There will always be competing demands for the available road network. Units cannot expect to be able to use all routes without requesting permission. Route synchronization planners establish control measures to ensure order and prevent congestion. For additional information on route synchronization, see ATP 4-16.

G-5. One method used to establish control is classifying MSRs and alternate supply routes. These classifications are based mainly on the ability of a route to support the expected traffic volume and types of vehicles that will use the route. The classifications specify the degree of control required and whether moving units should submit a movement bid (clearance request) to use a route. The classifications will be specified in the route synchronization plan. The five route classifications are—

- **Open route**. The route is open to all types of traffic and the moving unit does not need to submit a movement bid to use the route.
- **Supervised route**. The route is open to most types of traffic. However, convoys of certain size, vehicles of certain characteristics, and certain slow-moving vehicles may require a movement credit to use the route. The synchronization plan will specify the size of convoys or types of vehicles that require a movement credit.

- **Dispatch route**. Full control is exercised over a dispatch route. Priorities are set for use of this type of route. A movement credit is required for the movement of any vehicle or group of vehicles.
- **Reserved route**. This type of route is set aside for the sole use of a certain unit, specified operation, or type of traffic. If a route is reserved for a unit, then the commander of that unit decides how much and what kind of control is required.
- **Prohibited route**. No traffic is allowed over a prohibited route.

CONVOY OPERATIONS

G-6. A convoy is a group of vehicles moving from the same origin to a common destination and organized under a single commander for the purpose of control. Convoy operations provide flexibility and operational reach to the maneuver commander by allowing personnel, supplies, and equipment to be transported far forward on the battlefield. Convoys may consist of both manned and autonomous vehicles. For additional information on autonomous vehicles, see appendix M.

CONVOY ELEMENTS

G-7. Vehicles in a convoy are organized into groups to facilitate command and control. A convoy may be as small as a six-vehicle march unit or as large as a 300-vehicle column. Whenever possible, convoys are set up along organizational lines, such as squad, platoon, company, battalion, and brigade. Convoy elements include march units, serials, and columns as illustrated in figure G-1:

- **March units**. A march unit is the smallest element of a convoy. As the smallest subdivision of a column, march units may have up to 25 vehicles assigned. A march unit usually represents a squad to platoon size element. Each march unit has a march unit commander.
- **Serials**. A serial is a group of two to five march units. It represents approximately a company to battalion size element. Each serial has a serial commander.
- **Columns**. A column is a group of two to five serials. It represents approximately a battalion to brigade size element. Each column has a column commander.

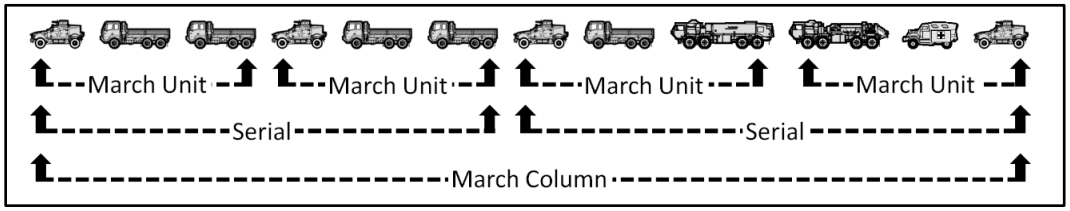


Figure G-1. Convoy elements

G-8. For example, a medium truck company commander can organize a convoy as a serial by dividing the 60 task vehicles by platoons into three march units of 20 vehicles each. The company commander would then serve as the convoy commander and the platoon leaders would serve as march unit commanders. Remaining vehicles would be added to each march unit for command and control and convoy support.

G-9. Convoy commanders should generally keep march units as large as feasible because of road space considerations. Multiple smaller march units reduce the amount of available road space because of the gaps between them. If the convoy commander determines that security requirements warrant greater separation between convoy elements, the 60 task vehicles could be divided by platoons into three serials of 20 vehicles each. The convoy commander could further subdivide each serial by squads into two march units of 10 vehicles each. In this example, the platoon leaders would serve as serial commanders and the squad leaders as march unit commanders.

G-10. Commanders must also remain aware of theater policies requiring a minimum march unit size due to threat or safety concerns, or mandatory convoy ratios of security elements to transportation assets (military or host nation). A commander may have to consolidate smaller march units into one larger one or combine with another unit to meet the requirements.

CONVOY SECTIONS

G-11. Leaders must know how to position vehicles within the convoy elements. All columns, serials, and march units, regardless of size, have three parts: a head, a main body, and a trail as illustrated in figure G-2. Each of these parts has a specific function:

- **Head**. The head is the first vehicle of each column, serial, and march unit. Each head should have its own pacesetter. The pacesetter rides in this vehicle and sets the pace needed to meet the scheduled itinerary along the route. The officer or NCO at the head ensures that the column follows the proper route. This individual may also be required to report arrival at certain checkpoints along the route. With the head performing these duties, the convoy commander has the flexibility to move up and down the column to enforce march discipline.
- **Main body**. This is the part of the convoy that may be subdivided into serials and march units for ease of control.
- **Trail**. The trail is the last sector of each march column, serial, and march unit. The trail officer/NCO is responsible for recovery, maintenance, and medical support. The recovery vehicle, maintenance vehicles, and medical support vehicles and teams are normally located in the trail. The trail officer/NCO assists the convoy commander in maintaining march discipline. This individual may also be required to report clear times at checkpoints along the route. In convoys consisting of multiple march units and serials, the convoy commander may direct minimum support in the trail of each serial or march unit and a larger trail party at the rear of the column. As the trail party may be left behind to conduct repairs or recovery, the convoy commander should provide trail security and communications.

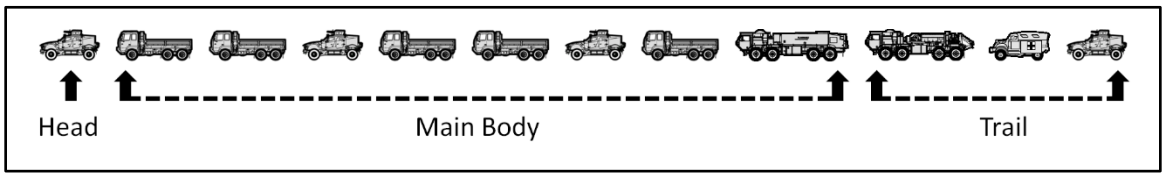


Figure G-2. Sections of a convoy

TACTICAL COORDINATION

G-12. Tactical coordination is initiated when the concept of operations or convoy request is submitted. Tactical coordination through the operations officer allows the convoy commander to leverage battlefield assets, such as air support and artillery, along designated portions of the convoy route. It also ensures ground support by the tactical commander while transiting their AO if needed. It is important to have current frequencies and maintain scheduled convoy start point times when these assets are supporting the convoy. See ATP 4-01.45 for additional information on tactical coordination and convoy security.

Convoy Security

G-13. Convoy security is the responsibility of the convoy commander, though it may be delegated to another leader in the convoy. The convoy commander ensures the proper ratio of security vehicles or gun trucks to other vehicles in the convoy based on local or theater requirements and TSOPs. If security is being provided by another unit, the convoy commander is still overall responsible for the convoy's security and convoy operations. Battle drills for most likely and most dangerous enemy courses of action and counter unmanned aerial system defense should be rehearsed prior to the convoy departing on its mission and discussed during the convoy brief. The convoy commander must also include security of autonomous distribution platforms as part of rehearsals.

Host-Nation and Contracted Truck Integration

G-14. Supporting operations may require the integration of host-nation or contracted vehicles into convoys to assist with the transport of materiel across the AO. When integrating these vehicles into military convoys, it is important to ensure security for the vehicles as they travel with the convoy. Placement of these vehicles may depend on organic vehicle composition of the convoy and the condition and cargo of the host-nation or contracted vehicles. It may be necessary to position these vehicles towards the front of the convoy to ensure

that the convoy's spacing and rate of march are manageable. This integration of host-nation vehicles may require an interpreter to ensure the vehicle operators understand what is required of them. Based on operational security and local SOPs, host-nation vehicle operators may not be authorized to attend the convoy briefing or carry communication devices while in the convoy. General information should be shared to make the convoy operation run smoothly, though specifics should be left out for operational security.

Note. For more detailed information on convoy planning, operations, and battle drills, see ATP 4-01.45, and DTR 4500.9-R, Part III, Appendix F.

Appendix H

Continental United States Convoys

Convoy operations conducted in the contiguous United States are like convoys conducted in support of operations. However, they require planning and coordination with the ITO for the Active Component, the defense movement coordinator of the Army National Guard State Area Command for Reserve and National Guard forces, and local civil authorities (law enforcement and Department of Transportation) of the state or states being transited. Their times traveling to or through an area may be regulated based on size, vehicle composition, and the cargo transported. For detailed information on military movements on public roads, see DTR 4500.9-R, Defense Transportation Regulation – Part III, appendix F.

CONVOY PLANNING AND COORDINATION

H-1. In CONUS, each state establishes rules, procedures, and laws that govern the use of public highways. Counties, cities, and municipalities may establish added restrictions for the use of their respective county or city routes. No vehicular movement that exceeds these legal limitations or regulations, or that subject highway users to unusual hazards (including movement of explosives or other dangerous cargo), will be made over public highways without prior permission from the appropriate state, local, or toll authority. These terms require that military convoys have an approved convoy clearance to travel on public highways and roads. In CONUS, a military convoy can be defined as one of the following:

- Any group of six or more vehicles temporarily organized to operate as a column, with or without escort, proceeding together under a single commander.
- Ten or more vehicles per hour dispatched to the same destination over the same route (except during mobilization and deployment, then all movements to a mobilization station will require a convoy clearance).
- Five or fewer vehicles operating as a column, with or without escort, proceeding under a single commander if one or more vehicles require the submission of a DD Form 1266.

H-2. Convoy planning is conducted in the same manner for CONUS operations as those conducted for support operations. The Army Service component commands and senior commanders may approve convoy requests in CONUS (and OCONUS) greater than 100 miles but less than 300 miles from the port of embarkation for Active Component forces. The first general officer in the chain of command may approve convoy operations in the U.S. greater than 100 miles but less than 300 miles for United States Army Reserve and Army National Guard forces. See ATP 3-35 for more details on convoy movements to the port of embarkation.

H-3. The two primary entities for coordinating to obtain a convoy clearance number are the ITO for the Active Component and the Army National Guard State Area Command for the National Guard and Reserve Components. These organizations coordinate with the state and local authorities to ensure convoy routes are feasible and clear for travel for the convoy according to the information submitted on the convoy request. Convoy requests are made using DD Form 1265 (*Request for Convoy Clearance*) or DD Form 1266 when appropriate. Active Component units submit convoy requests to their ITO not later than 30 days prior to the convoy. The ITO coordinates convoys with the defense movement coordinator of the Army National Guard State Area Command. Reserve Component units submit convoy requests to their higher headquarters not later than 60 days prior to the convoy. The higher headquarters coordinates convoys with the defense movement coordinator of the Army National Guard State Area Command. The ITO or defense movement coordinator may have other documents or special requirements needed when submitting a convoy request.

Note. For more detailed information on military movements on public roads, see DTR 4500.9-R, Defense Transportation Regulation – Part III, appendix F.

CONVOY IDENTIFICATION

H-4. A blue flag on the lead vehicle and a green flag on the rear vehicle should identify each column. Flags should be mounted on the left of the vehicles, either front or rear. The flags should be positioned so that they do not interfere with driver vision or the functional components of the vehicle. When movement is at night, the lead vehicle shows a blue light and the rear vehicle a green light. The vehicle of the convoy commander and the march unit commanders should display a white and black diagonal flag on the left front bumper. This flag is divided diagonally from the lower left corner to the upper right corner with the upper left triangle white and the lower right triangle black. Trail party vehicles carry an international orange safety flag. State and local police escort vehicles do not display convoy identification flags. The convoy movement order includes a convoy clearance number that identifies the convoy during its entire movement. The convoy clearance number is placed on both sides of each vehicle in the convoy and, if possible, on the front and back of each vehicle. It is also placed on the top of the hood of the lead and rear vehicles of each march unit. For additional information, see DTR 4500.9-R, Defense Transportation Regulation – Part III, appendix F, AR 840-10, and TC 21-305.20.

H-5. Plan night moves in the same manner as daylight moves. However, night moves take longer and there is a greater chance for mistakes. When planning a night move, determine if the convoy will operate in an area that requires blackout drive. The area commander will make this decision.

HIGHWAY CONVOY OPERATIONS

H-6. Main convoy routes, such as major highways and expressways, are usually characterized by heavy, fast-moving traffic. Entering, driving, and halting on these routes requires prior planning and coordination with civilian authorities.

CAUTION

Instruct convoy vehicle drivers NOT to give “clearance signals” to civilian vehicle operators. Responsibility for determining safe passing conditions rests with the driver desiring to pass.

ENTERING CONVOY ROUTES

H-7. The convoy should depart the assembly area at the time given in the movement order. Police support will reduce interference with other traffic and ensure the integrity of the convoy. Use the close column formation, 25-50 meters between vehicles, when moving from the assembly area to the main convoy route.

Note. Risk can be significantly reduced when civilian police assist by controlling civilian traffic. If a civilian police escort is not available, MPs or other military personnel may provide escort vehicles. However, military escorts have no authority to instruct military drivers to disregard traffic control devices or signs.

H-8. Most expressways are equipped with entrance and exit ramps and acceleration and deceleration lanes that are designed to allow vehicles to enter and leave without interfering with other traffic. When used properly, these lanes greatly reduce the risk of traffic accidents and help in the movement of the convoy. The following instructions apply both to the initial point of entry of the expressway and the return to it from a rest halt area:

- When appropriate, civilian police assistance should be obtained to direct convoy vehicles onto the expressway and to control civilian traffic. When civilian police are not present, use military police or other military personnel to signal military vehicles when it is safe to enter the expressway. Military traffic should not interfere with civilian traffic.
- Before driving onto the entrance ramp, reduce distance between convoy vehicles to a distance not less than 20 yards. This reduces the time the entrance ramp is blocked to normal traffic. Upon reaching the acceleration lane, increase convoy speed to equal as closely as possible that of other

traffic on the expressway. Convoy speeds will comply with posted minimum/maximum speed limits or those established by state law for commercial truck traffic. Vehicles that cannot maintain the posted minimum speed will be routed over an alternate non-controlled access road. Vehicles will operate in a safe and efficient manner and will not exceed the vehicle speed specified in operator manuals.

- When moving into the traffic lane and before merging, the driver should ensure that lanes are clear of oncoming traffic.
- After entering the traffic lane, drivers should not immediately try to move to the prescribed distance for expressway convoy operations but continue for a distance equal to the road space of the column. Drivers should then gradually attain the distance between vehicles for expressway driving or as given by the operation order and the final briefing.

Note. Vehicles should not slow down or close up while in a traffic lane of the expressway.

DRIVING ON EXPRESSWAYS

H-9. All vehicles should remain in the right lane once the convoy has entered the expressway. Where the right lane is reserved for traffic turning off at the next exit ramp, the convoy should use the next adjacent lane. Drivers should be alert and prepared to slow down or take other evasive action to avoid vehicles entering the expressway from acceleration lanes.

H-10. If a vehicle develops mechanical trouble, the driver should turn on the appropriate turn signal to alert the vehicle behind and move onto the shoulder of the road or into a parking area and wait for the arrival of the trail party. The remaining convoy vehicles should continue past the halted vehicle, leaving maintenance to be done by the trail party.

H-11. The following actions will help drivers to avoid drowsiness:

- Keep cab windows open.
- Shift body positions frequently.
- At rest halts, get out of the cab and move about.

REST AND MEAL HALTS ON CONVENTIONAL HIGHWAYS

H-12. When feasible, schedule rest halts so the convoy will halt for 15 minutes at the end of the first hour of operation and 10 minutes every two hours thereafter. When a suitable area is not available at these periods, minor adjustments may be made to this schedule. On conventional highways with adequate off-shoulder parking space, rest and meal halts normally do not present a problem. However, convoys should take the following precautions:

- Do not select rest areas located in urban or heavily populated areas.
- Avoid areas on curves or reverse sides of hills.
- Leave enough room to allow the vehicles to park off the paved portion of the road and return to the road safely.
- Maintain a minimum distance of three feet between parked vehicles.
- Place warning kit devices at the head and tail of the column unless the vehicles are completely off the highway and shoulder. Leave the flashing warning lights in operation and the headlights on. Post a guard behind the trail party with proper warning devices to alert, but not direct, approaching traffic.
- Do not permit convoy personnel, except for guards posted at the head and tail of each halted march element, on the traffic side of vehicles except to perform prescribed maintenance.
- Make sure drivers and assistant drivers perform prescribed at-halt maintenance and check the security of cargo. Deficiencies that cannot be corrected by the vehicle crew should be reported to the serial commander.
- Check drivers for illness and fatigue.
- When departing a rest stop, post road guides or other available personnel at least 50 yards behind the last vehicle to warn all traffic. When police support is provided, this step may not be required. Convoy vehicles should return to the highway as rapidly and safely as possible.

REST AND MEAL HALTS ON EXPRESSWAYS

H-13. Information on the location of rest areas and their truck parking capacities on expressways over which the convoy will move is available at each ITO. The designated federal or state rest areas planned for convoy use should be entered on the DD Form 1265.

H-14. Only emergency stopping is authorized on expressways. Official rest areas or parking areas may be used for scheduled halts of military convoys. On most expressways, these areas are located at 25 to 30 mile intervals. Normally, separate parking areas within the rest area are designated for truck and passenger car parking. Convoys should use the portion reserved for trucks. Convoy vehicles should not occupy more than 50 percent of the truck parking space at any time ensuring there is space for other vehicles. If the number of trucks in a convoy will exceed 50 percent of the truck parking area, organize the column into serials. There should be a sufficient time gap between serials to allow one to clear a rest area before the following serial arrives. Alternatively, convoy serials can be scheduled into different rest areas; however, this separates serials to such an extent that control is reduced. Normally, acceleration lanes are provided at rest areas to facilitate merging of vehicles with other traffic. The same procedures are used when departing a rest area as when making an initial entry onto an expressway. Meal halts on expressways require careful planning because of their longer duration. If the selected rest area cannot accommodate all the convoy vehicles, one of the following options can be taken:

- Phase the convoy into a rest area in serials with enough time gap to allow the preceding serial to eat and clear before the arrival of the next serial.
- Have all serials halt at about the same time but at different rest areas. However, this will require excessive gaps between elements, thus reducing the commander's control.
- Use the leapfrog method by requiring the first serial to halt at a rest area while the second serial continues to the next area, usually 25 to 30 miles ahead. By the time the first serial has completed its halt and arrived at the area where the second serial stopped, the second serial should be ready to join the column.
- Leave the expressway and use a previously selected area. This option allows all personnel to take a meal halt at the same time.

EXITING CONVOY ROUTES

H-15. To exit an expressway, either to enter a rest area or take another route, move vehicles to the deceleration lane at the earliest opportunity. Vehicles should reduce speed to posted exit speed limit.

REFUELING HALTS

H-16. Most military vehicles can travel 350 miles without refueling. Since this exceeds the distance a convoy normally travels in one day, arrangements for mass refueling before reaching the overnight halt are unnecessary. Refueling should be coordinated and planned in advanced. Vehicles with limited range should be refueled during the scheduled halts as well as during regular refueling halts.

TOLL ROADS, BRIDGES, AND TUNNELS

H-17. A convoy representative should be assigned to clear the convoy at the initial entrance to toll facilities and any intermediate points where tolls are collected. When possible, obtain toll tickets before the convoy departs from its point of origin. When this is not feasible, the convoy representative should arrive at the toll facility entrance in advance to purchase tickets and arrange for the uninterrupted movement of the convoy through the toll facility.

HALTS DUE TO MECHANICAL FAILURE

H-18. A vehicle disabled due to mechanical failure should immediately be moved from the traffic lane to a location where it will not be a hazard to other traffic. If a breakdown occurs while driving on an expressway or highway, the driver should take immediate action appropriate to the time of day and degree of visibility in the area.

SUNSET TO SUNRISE

H-19. During the time that lights are required (sunset to sunrise) and when forward visibility is reduced to 500 feet or less, a reflector should be placed either in the obstructed lane or on the shoulder of the road if the vehicle is on or over the shoulder. Place the reflector to face the traffic using that lane. Do this before any attempt is made to repair the vehicle. Reflectors should be placed in the following order:

- One reflector in the center of the lane of traffic occupied by the vehicle and not less than 40 paces (approximately 100 feet) from it in the direction of traffic approaching in that lane. If the vehicle is on or over the shoulder and does not occupy a traffic lane, the warning device should be placed on the edge of the roadway so that the traffic lane is not blocked.
- One reflector on the traffic side of the vehicle, four paces (approximately 10 feet) to its rear facing the traffic in that lane.
- One reflector 40 paces from the vehicle in the opposite direction.
- If the vehicle is stopped within 300 feet of a curve, crest of a hill, or other obstruction to view, the warning device in that direction should be placed to give ample warning to other users of the highway. However, the device should be placed not less than 80 paces or more than 120 paces from the vehicle.

SUNRISE TO SUNSET

H-20. During the time lights are not required (normally sunrise to sunset), place red flags or reflectors with mounted flags at the distances prescribed for night. Since most warning kits contain only two flags, the reflector placed 10 feet behind the vehicle will not have a flag mounted on it. DO NOT use military personnel to warn drivers by manual flagging except where emergency warning devices do not give adequate warning to civilian traffic.

ACCIDENT PROCEDURES

Note. These are guidelines to be used in the absence of local and unit SOPs.

H-21. If an accident occurs, every effort should be made to reduce its effects and to keep the convoy moving. If an accident happens in the convoy, take the following steps:

- Keep moving. Only the vehicle immediately behind the vehicle should stop and render assistance.
- Give first aid. Give immediate attention to injuries.
- Wait for assistance. Do not move the damaged vehicle until an accident investigation has been completed. Report any accident IAW DA Pam 385-40.
- Clear the traffic lane. The crew of the affected vehicle should make every effort to clear the traffic lane as soon as possible. In case of injuries, the crew of the assisting vehicle may be required to move the damaged vehicle.
- Prepare the accident report. Whenever a military vehicle is involved in ANY accident, the driver will prepare a SF 91. In the event of an accident, photographs should be taken of the vehicles involved, any damage to property, and the accident scene. The photographs should be retained with the SF 91. When possible, every convoy vehicle should have a camera.

H-22. The operator involved will record on-the-spot information on the SF 91. If the operator is unable to prepare the report at the scene of the accident, it will be prepared by anyone so directed. The report should be completed and delivered to the operator's immediate supervisor as soon as possible for use in preparing DA Form 285-W (*Technical Report of U.S. Army Ground Mishap Summary of Witness*).

H-23. Before any accident report is sent to a state or local agency, the report will be submitted first to the appropriate claims officer for review to ensure the rights of the United States Government are not prejudiced by admission of liability.

H-24. It is essential that personnel be trained to obtain all vital information at the scene of the accident and to complete all entries on the form. Information will often be unavailable after witnesses have left or vehicles have been removed from the scene of an accident. Each item of the report should be checked to make sure it

gives a complete picture of facts leading to the accident and what occurred in the accident. If there is any question as to the validity of information obtained for the report, a notation should be made to this effect.

Note. When a civilian driver is involved in the accident, their name should be obtained from their driver's license.

H-25. The first officer or NCO to arrive at the scene of the accident will take charge by supervising emergency aid, directing military traffic, warning civilian traffic, and directing placement of warning devices until the trail officer arrives. The assistant convoy commander or trail officer, aided by available medical and maintenance personnel, will supervise and direct care of the injured and disposition of the damaged vehicles. Any further assistance needed should be requested from the agencies listed in the convoy operation order.

VEHICLE ACCIDENTS CAUSING A FIRE

H-26. Motor convoys travel mostly over highways in rural areas. Fire departments in these areas are widely scattered, and firefighters may have to travel a long distance to respond to an emergency. This means that convoy control personnel will probably be the first to arrive at the scene of the accident and should be prepared to rescue endangered personnel, attempt to control the fire, or take steps to prevent a fire. If the accident results in a vehicle fire, convoy supervisory personnel should take the following actions:

- Halt the control vehicle a safe distance from the fire. Direct the driver or other convoy personnel to notify the nearest fire department and police department using the most expeditious means (for example, roadside emergency, service station, or private residence telephone). If radio communication is available, notify the convoy commander.
- Remove injured personnel from burning vehicles as quickly as possible, even when it means subjecting a person to further injury. Follow established first aid procedures in caring for the injured before attempting to control fire in unoccupied vehicles.
- Keep spectators at a safe distance.
- Attempt to extinguish the fire with the control vehicle extinguisher, extinguishers from other vehicles, or with sand or mud.

H-27. In the event of an accident involving a truck carrying either explosives or hazardous cargo, supervisory personnel should take the following actions:

- Approach cautiously. Resist the urge to rush in; people involved in the accident cannot be helped or rescued until the hazards are known.
- Move and keep people away from the scene.
- Immediately notify all assisting agencies and personnel of the hazards involved.
- If the accident results in a fire hazard, supervisory personnel should—
  - Halt the control vehicle a safe distance from the accident. Direct the driver or other convoy personnel to notify police and fire departments by the fastest means. When radio communication is available, notify the convoy commander.
  - Turn off the ignition and lights of the vehicles involved. Because of the possibility of sparks, do not remove battery cables unless necessary.
  - Notify nearby residents when spillage may place them in danger.

H-28. An extremely dangerous situation exists if the accident involves high-tension power lines. The danger is even greater when the downed lines are touching a vehicle. Convoy supervisory personnel will take the following steps:

- Contact police immediately and explain the situation. The police will be able to contact the power company for emergency assistance quicker than the convoy personnel.
- If wires are touching any of the vehicles involved, direct the occupants to remain in place until the power company workers can cut off the electricity and remove the wires.
- In case of serious injury where death may be imminent unless rescue is affected, attempt to remove the wires, assist the injured from the vehicle, render first aid, and obtain medical assistance.

Appendix I
Communications and Communications Security

The Army has developed and fielded several automated information systems which have revolutionized the way motor transport units conduct operations. One category of automated information systems, situational awareness systems, provide motor transportation unit commanders, planners, and mode operators with an unprecedented level of visibility of vehicle platforms and cargo moving through the distribution system. This increased visibility facilitates better assessment of, and planning for, mission requirements in support of operations. Army motor transport units use situational awareness systems to great effect, achieving improved command and control of logistics operations and increased survivability for Soldiers. This appendix provides an overview of different communication systems that facilitate motor transport operations.

AUTOMATED INFORMATION SYSTEMS

I-1. Department of Defense automated information systems are designed to interface with commercial transportation information systems to receive and pass required personnel, unit, and cargo movement data and other transportation information to appropriate commands and agencies throughout the Department of Transportation. This capability exists to the extent that commercial carriers have formatted their Electronic Data Interchange Reports to Department of Transportation standards. United States Transportation Command, as the functional proponent for radio frequency identification (RFID) and related automatic identification technology implementation is constantly working with the Services, combatant commanders, Defense Logistics Agency, and other DOD partners to refine and adjust these requirements as technology breakthroughs and business processes dictate change.

AUTOMATIC IDENTIFICATION TECHNOLOGY

I-2. Automatic identification technology is the basic building block in the Defense Department's efforts to provide timely asset visibility in the logistics pipeline, whether in process, in storage, or in transit. Automatic identification technology media includes barcodes, RFID, satellite tracking systems, smart cards/common access cards, optical memory cards, and contact memory buttons. By enabling data collection and transmission to the automated information systems, automatic identification technology provides the Soldier with the capability to track, document, and control the deployment of personnel and materiel.

IN-TRANSIT VISIBILITY

I-3. ITV is visibility over those portions of the distribution system encompassing the flow of assets from the consignor to the consignee, port, servicing airhead, supply support activity, or other destination. This includes force tracking and visibility of convoys, containers and pallets, transportation assets, and other cargo. See ATP 4-16 for additional information on ITV.

I-4. Within the theater, asset visibility is achieved by linking automatic identification technology such as RFID tags, memory buttons, smart cards, and barcode readers with automated information systems. These can also be linked with ground and satellite transmission stations, providing the means to influence the flow of materiel throughout the distribution system.

I-5. TSC materiel managers maintain theater-wide asset visibility for the following commodities:

- Class III bulk petroleum.
- All class VII materiel (less communications security items).
- Class IX theater-level repairable items.
- Selected items of interest.
- Theater-level conventional ammunition, guided missiles, and large rockets.

RADIO FREQUENCY IDENTIFICATION

I-6. The need to know what you have, where it is, and how to find it anywhere in the logistics system is critical in projecting and sustaining the force. RFID is a proven technology platform that has significantly enhanced the effectiveness and efficiency of the battlefield distribution system. However, it does not provide real time data; information is only as good as the last interrogator. Whether in a port, supply support activity, staging area, cargo transfer point, or ammunition storage activity, RFID technology offers advantages which are essential to effective distribution. Commanders should stress the importance of RFID tag technology in total asset visibility and ITV, emphasizing its use in tracking materiel in the logistics pipeline.

I-7. RFID technology uses radio wave transmission and reception to pass military standard requisitioning and issue procedures, military standard transportation and movement procedures, and shipment information about objects that need to be identified or tracked. These objects can be vehicles, pallets, containers, or other intermodal equipment. The information is stored on the tag with media storage capability similar to a computer's random-access memory. Antennas or interrogators can read the information contained on the tag attached to the item and pass it back to a central database. Under certain conditions, it will also be desirable to write to the tag from an interrogator to update information concerning the tagged item. This remote read/write capability sets the RFID tag apart from other automatic identification technologies such as bar coding and optical memory cards. Currently these tags can be manipulated at a range of approximately 250 feet between the RFID tag and interrogator.

UNIT PLANNING CONSIDERATIONS

I-8. RFID technology should be used during peacetime operations, combat training center training scenarios, and during installation and deployment operations. Units are responsible for ordering and attaching RFID tags on their equipment to maintain visibility. RFID tags are available through existing supply channels. DOD has improved RFID tag and infrastructure technology. The new tag technology alleviates tag numbering constraints, improves interoperability with coalition partners, and improves tag capabilities for sensor functions.

JOINT BATTLE COMMAND-PLATFORM LOGISTICS

I-9. The Joint Battle Command-Platform (commonly known as JBC-P) is a networked mission command information system that enables Army and Marine Corps units to share near-real-time friendly, enemy, and battlefield situational awareness, operational maps and graphics, and command and control messages. Joint Battle Command-Platform Logistics (commonly known as JBC-P LOG) is the logistics variant of the system. It provides logistics situational awareness information about the joint operational environment and ITV of all classes of supply to improve logistics management and increase command situational awareness.

I-10. Joint Battle Command-Platform Logistics provides tools to communicate and track logistics and maneuver formations as well as provide in-transit, near-real-time visibility of critical cargo. Its search tag feature, a command post function of the system, allows materiel managers to find out which truck or platform specific cargo is loaded on.

RADIO COMMUNICATIONS

I-11. Motor transport units are normally provided frequency modulation (FM) voice radio sets to supplement digital communications and preexisting wire systems. These voice radio sets are used to facilitate the control of road movements, provide command and control of company elements operating a distance from the company area, and provide effective communication with higher headquarters when distance permits.

I-12. The single channel ground and airborne radio system-advanced system improvement program is a single net, short-range, FM radio transceiver that can be configured for a man pack or utilized with a vehicular radio communications mount. There are multiple variants of the vehicular radio communications mount, which can provide a vehicle with one or two radios and subsequently a single or dual net. The vehicular radio communications mount can also turn the original radio from a short range to a long-range radio with use of a vehicle mounted long-range antenna. Motor transport companies authorize FM radios for use and each company varies in its authorization for vehicular radio communications mounts. Vehicular radio

communications are utilized to maintain communications internally within convoys, and externally to the company tactical operations center. Radios are particularly vulnerable to enemy electronic warfare since they radiate electromagnetic energy and may be readily detected, intercepted, analyzed, and exploited.

COMMUNICATIONS SECURITY

I-13. Communications security (COMSEC) is the protection resulting from all measures designed to deny unauthorized persons information of value that might be derived from the possession and study of telecommunications and to ensure the authenticity of such communications. The following qualify as COMSEC:

- Crypto security.
- Emission security.
- Transmission security.
- Physical security of COMSEC materials and information.

I-14. The unit commander should ensure that COMSEC measures are understood and observed by all unit personnel using communications equipment. Motor transport unit personnel are concerned with all types of COMSEC. However, transmission security and physical security are of primary concern.

TRANSMISSION SECURITY

I-15. Transmission security is that component of COMSEC that results from all measures designed to protect transmissions from interception and exploitation by means other than crypto analysis. Radio is particularly susceptible to interception, direction finding, traffic analysis, and deception. The radio operators should be thoroughly trained in correct communications procedures. They should also be constantly alert so as not to divulge information to the enemy through faulty operating procedures and techniques. Personnel preparing messages for transmission should be aware of the ability of the enemy to obtain information from radio traffic.

PHYSICAL SECURITY

I-16. Physical security is the component of COMSEC that results from all physical measures taken to safeguard classified equipment, material, and documents from access or observation by unauthorized personnel. Before vacating a command post or other facility used for communications purposes, check thoroughly for copies of messages or carbons and copies of maps or orders that might prove beneficial to the enemy. Give special attention to signal operating instructions items, including their production, distribution, storage, and final disposition when superseded or no longer needed. When a signal operating instruction item or an extract of a signal operating instruction item is believed to be lost or otherwise compromised, the fact should be reported, and the item replaced immediately. The unit commander should specify in the unit TSOP precisely how the report is to be made. Security violations will be reported immediately through communications and command channels at a minimum.

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Appendix J

Military Vehicle Axle Weight Distribution Formulas and Percentages

Vehicle weight scales are not always available to military field units moving truck convoys over CONUS public highways. Therefore, the Army has developed loaded vehicle axle weight distribution formulas and percentages to help units prepare required forms. This appendix discusses distribution formulas and percentages. Whenever possible, units should use actual axle loads obtained by weighing the loaded vehicle. Units should follow local SOPs for other automated weight and scales tools to conduct weight and balance calculations.

LIMITATIONS

J-1. Percentages can be used for any loaded cargo truck and tractor semitrailer combination. However, the following should be available to determine vehicle axle load distribution:

- Technical manual (TM), shipping data plates, or vehicle data sheet for the cargo truck, tractor, and semitrailer.
- Weight of empty vehicle.
- Weight of payload.
- Other necessary dimensions obtained from vehicle TM or data sheet.

PROCEDURE

J-2. Follow these steps to determine axle weight distribution using the percentages in this appendix:

- Step 1. Determine GVW.
- Step 2. Choose applicable percentages from the table for the number of axles and type of vehicle (see table below).
- Step 3. Multiply GVW by each percentage to determine various axle weight distributions.
- Step 4. Record each weight.

J-3. Example: (The Percentage Method) The GVW for an M916A2/M872A4 tractor-semitrailer combination is 95,700 pounds. This is a six-axle vehicle. Therefore, in the first column labeled “Number of Axles per Vehicle,” find 6. To the right of 6 under “Type of Vehicle” is semitrailer and under the “Axle 1” column is 11. Multiply the GVW by 11 percent to find the front axle weight distribution. The “Axle 2”, “Axle 4”, “Axle 5”, and “Axle 6” columns show 18 percent. Multiply the GVW by 18 percent to determine the weight distribution on each of these axles. The “Axle 3” column show 17 percent. Multiply the GVW by 17 percent to determine the weight distribution the third axle. Record each axle weight distribution.

- GVW for M916A2/M872A4 = 95,700 lb.
- GVW = 95,700 lb. x 11 percent = 10,527 lb. (front axle weight distribution)
- GVW = 95,700 lb. x 18 percent = 17,226 lb. (2nd, 4th, 5th, 6th axle weight distribution)
- GVW = 95,700 lb. x 17 percent = 16,269 lb. (3rd axle weight distribution)

J-4. Formulas and percentages in this appendix (table J-1 and figure J-1 on page 74) are used in lieu of American Trucking Associations weight limits only when American Trucking Associations, Inc. data is not available.

Table J-1. Percentages for axle weight distribution

Number of Axles per Vehicle	*Type of Vehicles*	*Axle 1*	*Axle 2*	*Axle 3*	*Axle 4*	*Axle 5*	*Axle 6*	*Axle 7*
2	2 ½ Ton	63	37	—	—	—	—	—
3	5 Ton	50	25	25	—	—	—	—
5 (Semitrailer with 2 axles)	Semitrailer	14	20	20	23	23	—	—
6 (Semitrailer with 3 axles)	Semitrailer	11	18	17	18	18	18	—
7 (Semitrailer with 3 axles)	Semitrailer	11	5	19	19	15	15	16
7 (Tractor with 2 front and 2 rear axles)	Semitrailer	10	10	17	16	18	17	12

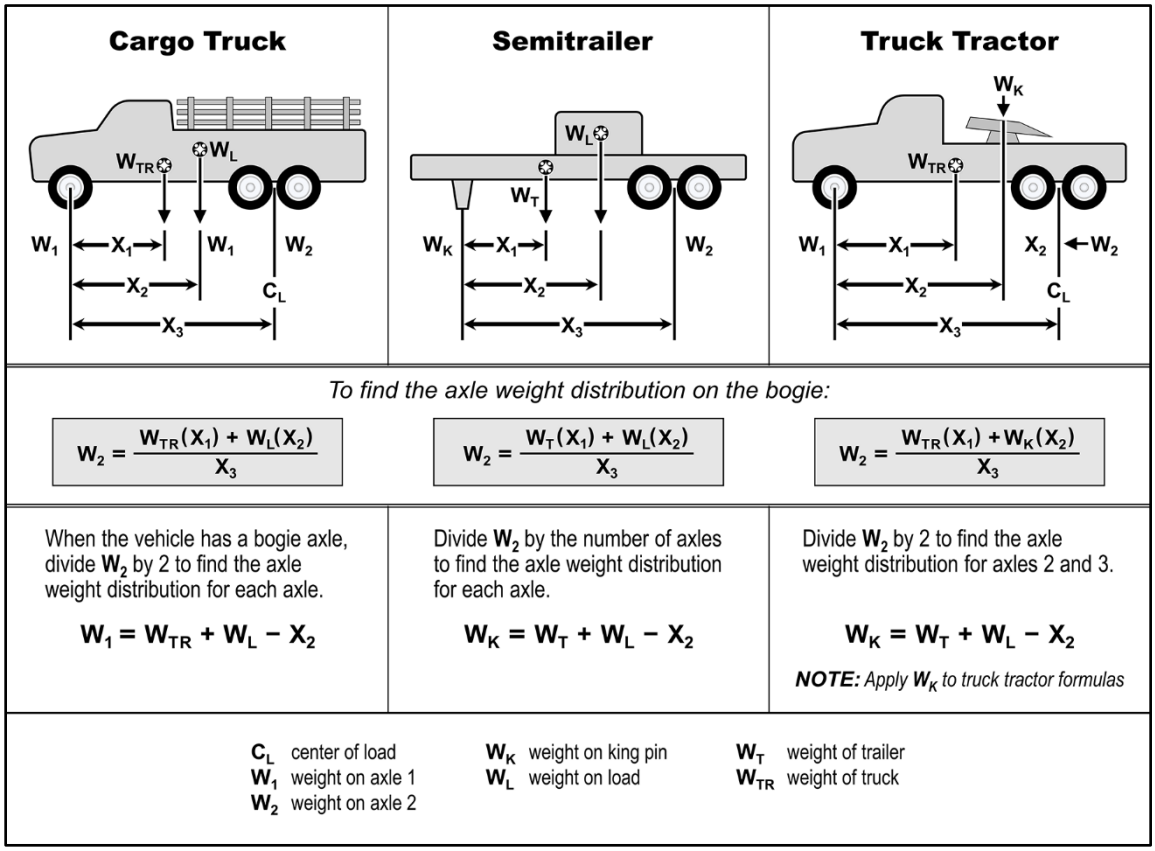


Figure J-1. Formulas for axle load weight distribution

Appendix K

Planning Considerations for Transportation in Large-Scale Combat Operations

This appendix discusses operational considerations for a motor transport company supporting large-scale combat operations. Large-scale combat operations place a heavy burden on the distribution system. The characteristics of large-scale combat operations force a tradeoff between tactical mobility and sustainment mobility. Motor transport units must train to operate and survive in such an environment. Chapter 3 described large-scale combat operations in detail. This appendix provides additional planning considerations for motor transportation.

SURVIVABILITY IN LARGE-SCALE COMBAT OPERATIONS

K-1. Enemies often explicitly target sustainment assets for destruction early in combat. The high tempo of large-scale combat operations may overwhelm transportation units and put a gap in meeting support requirements for maneuver units. Transportation units must be able to protect themselves, their equipment, and materiel. For additional information regarding survivability in large combat operations see FM 4-0.

K-2. The distributed nature of large-scale combat operations will create increased requirements on transportation assets. Two corps engaged in tactical formation may significantly increase demands on transportation assets and requirements for distribution and retrograde of materiel and personnel during offensive and defensive operations. Planners must also anticipate additional transportation assets, to include force protection, that may need to be echeloned forward to support resupply, troop movement, casualty evacuation, and retrograde for maneuver brigades. Transportation requirements that exceed Army capabilities must be mitigated through support from contracting, joint Services, and unified action partners.

COMPANY/PLATOON DEFENSE

K-3. Larger perimeters or dispersed platoon areas are more survivable against enemy artillery or air attacks but will require more manpower to defend. Units conducting perimeter defense operations should closely coordinate with their higher headquarters on their remaining capability when conducting both defensive and sustainment operations.

K-4. Transportation units may need to conduct mounted and unmounted sweeps and patrols of their local areas to discover dead zones and search for signs of enemy presence. Commanders will also need to assign a quick reaction force. Soldiers conducting such operations should be trained before deployment and conduct rehearsals as required during operations.

UNIT DISPERSION

K-5. Dispersion is vital in surviving in a high-intensity, artillery-laden battlefield. Combat units will spread out to ensure no single unit is destroyed in a single attack; sustaining those forces will be challenging. Operating in a complex, mobile, dispersed and ever-changing battlefield is dangerous when movement invites detection, and detection can lead to destruction.

K-6. As the combat elements spread out, so should the transportation companies. Transportation companies must be able to disperse, hide, and survive, but also to converge when and where support is required.

K-7. Units should ensure their logistics footprint is as small and difficult to detect as possible. Units, especially distribution companies and FSCs, should keep cargo and supplies as mobile as possible. They should strive to minimize their footprint, keeping as many supplies as practical on trucks or in areas with overhead cover or concealment. Units should practice moving a BSA, company area, or TTP as quickly and efficiently as possible without detection.

SUPPLY POINT DISPERSION

K-8. Units should break up larger supply points into smaller ones with mixed commodities as much as possible, so that the destruction of one point does not eliminate the entirety of supply. Smaller supply points are also easier to camouflage and hide.

UNIT DECEPTION

K-9. Deception activities seek to hold the adversary's attention and can mitigate the impact of hazards that drive risk. Leaders must consider deception as a way to impose multiple dilemmas on the enemy, achieve operational surprise, and maintain the initiative. Deception efforts by tactical formations seek to delay enemy decision making until it is too late to matter, or to cause an enemy commander to make the wrong decision. Deception requires an understanding of how to surprise enemy forces; time to plan, prepare, execute, and assess a deception operation; and the ability to properly resource the deception effort.

K-10. Sustainment capabilities can be used at echelon by operational commanders to deceive an adversary. The use of autonomous motor transport vehicles can be used as part of deception in the land environment. Leaders can employ autonomous vehicles in locations other than where operations are intended to cause the enemy to react in an unplanned manner. See FM 4-0 and FM 3-13.4 for information on deception.

ELECTROMAGNETIC FOOTPRINT

K-11. Commanders should enforce noise, litter, and light discipline and ensure their units are hidden from as many sensors across the electromagnetic spectrum (near infrared, infrared, visual, ultraviolet, radar, acoustic, and radio) as possible.

K-12. Units must obey radio discipline to help prevent discovery by enemy radio-detection equipment. Examples include using prowords, brief transmissions, and shielding omni-directional antennas from broadcasting towards the enemy.

K-13. Units must pre-plan alternatives to radio/digital communications to combat enemy jamming equipment. For example, leaders converging at specified points and times for passing along orders.

CAMOUFLAGE, CONCEALMENT, AND DECOYS

K-14. Commanders should ensure every vehicle and tent in their unit has functional camouflage to mask their presence, and that Soldiers are trained in the quick and quiet set-up and disassembly of assigned systems.

K-15. Commanders and recon team leaders should always be aware of and looking for locations that will conceal units from observation, particularly from overhead spotters. Parking garages, warehouses, and hangars are all examples of facilities that have the room for a transportation unit to operate in and provide concealment from enemy observation.

K-16. Decoy vehicles and equipment are also relatively inexpensive and quick to construct prior to combat operations. Commanders should encourage or enforce their use as much as practical. Decoys should be quick to set up and tear down. Decoys should also be camouflaged/emplaced identically to their real counterparts. The decoys should also be disposable and expendable. See ATP 3-37.34 for more information on camouflage and concealment operations.

RESILIENCY

K-17. Due to the enemy’s emphasis on artillery systems, transportation units may suffer tremendous casualties within short amounts of time. Upon order, a transportation unit may be instructed by their higher command to reconstitute via reorganization or regeneration.

K-18. Reorganizing is a command function within the capability of the commander directing it. For example, a company commander may reorganize squads to balance out maintenance losses. Regeneration is above the unit’s capability and is generally a command decision at the operational level, as it requires planning to integrate the timing, location, and personnel and weapons system replacement.

K-19. Regeneration builds upon an already existing unit, and operational commanders might direct a local commander to reorganize before reconstitution; blending assets from one company to bring another up to strength, and then regenerating the first while the second continues the fight. Transportation leaders must

understand that regeneration is a deliberate action conducted as the battlefield situation permits and should prepare their unit to continue operations until ordered to reconstitute.

K-20. Commanders in charge of depleted units must communicate their reduced capabilities and capacities, informing planning and operations sections of their practical limitations. A commander must provide realistic estimates of capability to maintain realistic expectations of support for supported units.

K-21. The tactical situation may not allow the opportunity for units to conduct formal ceremonies when deaths have occurred, but upon order to reconstitute, commanders should set aside and plan memorial ceremonies with supporting chaplains. The requirement to rebuild a Soldier's internal resiliency might be delayed a bit due to the operating tempo of large-scale combat; however, a Soldier's need for emotional reset is as vital for the unit to function as equipment replacement, and the requirement should eventually be met.

K-22. Commanders should ensure Soldiers are not only tactically and technically capable, but also physically fit before deployment. Large-scale combat is intense, and physically fit Soldiers are better able to continue through long periods of heavy activity without physical injury. Commanders should also enforce a rest plan for their soldiers and company leaders as much as practical. Tired Soldiers make mistakes that can cause injury to themselves or others; tired leaders make mistakes that can get units destroyed.

OTHER PLANNING CONSIDERATIONS

K-23. Transportation operations during large-scale combat are often conducted simultaneously or sequentially with survivability movements. Leaders must ensure that all members of the unit understand the unit's mission to include task, purpose, and commander's intent; give clear and concise orders; and closely coordinate their operations and displacements with supported units and higher headquarters.

MOBILITY

K-24. Recent conflicts around the world have shown the ever-expanding dangers and utilization of drones and unmanned aerial vehicles by combatants. Though some nations are arming their drones, one of the most dangerous uses of surveillance drones is as forward observer aircraft.

K-25. Many enemy armies have organic artillery support at the brigade level that is twice to triple the amount available to United States Forces. Logistics units are often high-value targets for the enemy due to their importance in maintaining the combat power of frontline elements. Transportation companies should operate with the understanding that their every movement, especially standing still, may draw an artillery barrage. Commanders must prepare their units to operate and survive under these conditions.

K-26. Modern logistics demands adaptive yet efficient supply chains to maintain a high volume of supply to whichever domain owner that is the designated lead. The force commander may change the primary and supporting efforts often, depending on effective information systems and the synchronization of intelligence, surveillance, reconnaissance, and joint fires. Therefore, transportation units may find themselves supporting new units with little to no warning, across different Services or nationalities.

K-27. Due to the high lethality and effectiveness of enemy anti-access/area denial technology and systems, United States superiority across multiple domains in general will be challenged or possibly denied. However, combat forces can achieve periods of superiority, opening windows of opportunity. Transportation leaders must stand ready to take advantage of such opportunities, surging maximum capability as they arise. Leaders will be required to begin to integrate autonomous capabilities outlined in Appendix M.

SOLDIER AS A SENSOR

K-28. Because of the constant need to displace, a transportation unit may find its leaders doing multiple, almost continuous site recons. Between the recons and standard operations, transportation units are often the only units that may physically pass by many miles in the division's interior area. Commanders should ensure Soldiers stay alert for potential enemy activity, including ambushes or interdictions.

K-29. In addition, depending on the threat situation, Soldiers should also be trained on the signs of CRBNE attacks and understand how to call in the reports via local SOPs. Transportation units, by their nature, might be the closest unit to a CRBNE attack that was not the target, so those Soldiers must be trained to recognize, survive in, and report on contaminated areas.

MEGACITIES

K-30. The United Nations defines megacities as cities with more than ten million residents. Their large size increases the challenges of normal city operations, and introduces new, unique challenges. See ATP 3-06 for planning considerations and operations in megacities.

Physical Terrain

K-31. The vertical terrain of skyscrapers and other structures creates urban canyons that prevent or disrupt visibility, concealment, line of site, and satellite navigation and communication equipment. Leaders must compensate for communication dead zones with detailed coordination, realistic back-up plans, and trust in subordinates.

K-32. Narrow thoroughfares will constrict ground movement, while the building density will limit landing and pickup zones or flight paths for manned/unmanned aircraft.

K-33. The complicated networks of streets and alleys vastly increase enemy avenues of approach, while windows and rooftops at every elevation provide the enemy multiple attack platforms. Sewers, utility passageways, and subways provides enemy forces with an additional dimension from which to ambush transportation units with explosives, or to strike and disappear using the city's own infrastructure.

K-34. Megacities often have multiple, well-developed routes, but many of them will not be marked as useable alternate supply routes. Units should request deviation to alternate supply routes as needed to avoid high threat areas, but not deviate from marked routes without permission except in dire emergencies. Unknown routes are incredibly dangerous in a megacity; using unknown, unmarked routes may lead a unit down a street without the ability to turn, pass, fight, or call for assistance.

Civil Considerations

K-35. Due to the high population density, the potential threat of civilian casualties resulting from an engagement can be high. Units must be familiar with the rules of engagement.

K-36. Indigenous enemy forces can easily blend into the local population and will most likely be familiar with the terrain. Attacks on friendly forces may come from enemy forces, criminals, or irregular threats with widely different goals and objectives. Commanders should ensure their units have accurate and timely intelligence from higher headquarters and have Soldiers provide accurate debriefings to help build the common operational picture.

Appendix L

Unit Conversions

This appendix gives the linear and liquid measure and weight equivalents of U.S. units to metric units. Also included are conversion factors for the most commonly used measurements and weights.

Table L-1. Linear measure conversions

	Kilometers to miles	***Miles to kilometers***
Quantity	***km x 0.621 = mi*** ***km ÷ 1.609 = mi***	***mi x 1.609 = km*** ***mi ÷ 0.621 = km***
1	0.62	1.61
2	1.24	3.22
3	1.86	4.83
4	2.48	6.44
5	3.10	8.05
6	3.72	9.66
7	4.34	11.27
8	4.96	12.88
9	5.58	14.49
10	6.21	16.10
20	12.42	32.20
30	18.63	48.30
40	24.84	64.40
50	31.05	80.50
km kilometer mi mile		

Table L-2. Liquid measure conversions

	Pint (U.S.)	***Quart (Imperial)***	***Quart (U.S.)***	***Liter***	***Gallon (Imperial)***	***Gallon (U.S.)***
Pint (U.S.)	—	0.4163	0.5	0.4732	0.1041	0.125
Quart (Imperial)	2.4019	—	1.201	1.1365	0.25	0.3001
Quart (U.S.)	2	0.8327	—	0.9464	0.2082	0.25
Liter	2.1134	0.8799	1.0567	—	0.22	0.2642
Gallon (Imperial)	9.6076	4	4.8038	4.5461	—	1.201
Gallon (U.S.)	8	3.3307	4	3.7854	0.8327	—

Table L-3. Weight conversions

	Pound	***Kilogram***	***Short ton***	***Long ton***
Pound	—	0.4536	0.0005	0.00045
Kilogram	2.2046	—	0.0011	0.00098
Short ton	2000	907.185	—	0.8929
Long ton	2240	1016.05	1.12	—

Table L-4. Simplified conversion factors for quick computation

	Formula	***Example***
Inches to centimeters	***Multiply by 10 and divide by 4***	***(18 inches x 10) ÷ 4 = 180 ÷ 4 = 45 centimeters***
Centimeters to inches	Multiply by 4 and divide by 10	(75 centimeters x 4) ÷ 10 = 300 ÷ 10 = 30 inches
Yards to meters	Multiply by 9 and divide by 10	(33 yards x 9) ÷ 10 = 297 ÷ 10 = 29.7 meters
Meters to yards	Multiply by 10 and divide by 9	(23 meters x 10) ÷ 9 = 230 ÷ 9 = 25.556 yards
Miles to kilometers	Multiply by 8 and divide by 5	(64 miles x 8) ÷ 5 = 512 ÷ 5 = 102.4 kilometers
Kilometers to miles	Multiply by 5 and divide by 8	(15 kilometers x 5) ÷ 8 = 75 ÷ 8 = 9.375 miles
Gallons to liters	Multiply by 4 and subtract 1/5 of the number of gallons	(26 gallons x 4) – (26 ÷ 5) = 104 – 5.2 = 98.8 liters
Liters to gallons	Divide by 4 and add 1/60 of the number of liters	(180 liters ÷ 4) + (180 ÷ 60) = 45 + 3 = 48 gallons
Pounds to kilograms	Multiply by 5 and divide by 11	(42 pounds x 5) ÷ 11 = 210 ÷ 11 = 19.091 kilograms
Kilograms to pounds	Multiply by 11 and divide by 5	(55 kilograms x 11) ÷ 5 = 605 ÷ 5 = 121 pounds
NOTE: All conversions are accurate to within 2 percent		

Appendix M
Future Fielding

The purpose of this appendix is to describe the Autonomous Transport Vehicle-System as it is being developed and implemented into the force. Autonomous transport capability is an emerging human and machine integrated technology capability. The purpose for using this capability is to extend operational reach, improve sustainment throughput, improve force protection, and achieve longer durations of convoy and resupply operations.

M-1. Integration of autonomous tactical systems in future sustainment formations will include autonomous tactical wheel vehicles, autonomous trailers, and quadcopters to enhance operational effectiveness during operations. Autonomous tactical wheeled vehicles will provide full autonomous command and control capabilities initially integrated into existing Army transportation platforms. Sustainment units require full autonomous transportation and distribution capabilities to increase throughput and mitigate threats to personnel conducting sustainment operations. By achieving full autonomy, sustainment transportation and distribution vehicles will not require drivers and vehicle commanders, thus reducing risk to personnel when employed.

M-2. Operational roles of autonomous trailers and quadcopters will be organic to FSCs, BSBs and group support battalions. During large-scale combat operations, autonomous trailers will operate between BSAs, logistics release points, and ambulance exchange points to enhance freedom of maneuver and extend operational reach. Quadcopters will address the Soldier load problem set by enabling commanders to tailor combat loads, retain initiative, and exploit success without interruptions for traditional resupply. Furthermore, quadcopters facilitate the delivery of critical supplies to the forward edge, thereby extending the fight without risk to expensive airframes, pilots, and crews.

M-3. Collaborative integration of autonomous tactical wheeled vehicles ensures mobility and logistics support across diverse terrains, providing adaptability in dynamic environments. Quadcopters focus on autonomous aerial resupply to bridge gaps in supply chains, particularly in contested areas. Autonomous trailers contribute silent export power, deception operations, and multiclass supply package delivery for both mounted and dismounted forces, in addition to performing casualty evacuation missions. This functionality allows medics and field litter ambulances to prioritize medical evacuations requiring enroute care. Together, these systems create a symbiotic relationship where one capability complements the others, enabling synchronized operations, faster response times, and reduced human risk. The integration of autonomous tactical wheeled vehicles, autonomous trailers, and quadcopters represents a significant advancement in autonomous systems, redefining military logistics and tactical strategies for operations.

M-4. The Autonomous Transport Vehicle - System is an applique kit comprised of hardware and software which enables a tactical wheeled vehicle to operate autonomously. The first platform Autonomous Transport Vehicle - System will be implemented into the M1075A2 PLS. Future Army tactical wheeled vehicles will come with the digital backbone to integrate the Autonomous Transport Vehicle - System kit to provide autonomous capability throughout the force. The premise of utilizing Autonomous Transport Vehicle - System is to reduce Solider exposure to hostile effects by operating remotely, increasing throughput, enhancing operational effectiveness, and supporting the combatant commander’s operational tempo.

M-5. The Army is in the process of transforming existing tactical wheeled vehicles to semi or fully autonomous systems. Army Program Managers are pursuing technology for integration onto current and future tactical wheeled vehicles with Autonomous Transport Vehicle - System being an autonomous solution. Autonomous Transport Vehicle - System equipped M1075A2s will primarily reside in composite truck companies within a DSB. The introduction of autonomous vehicles is intended to be an added capability and not designed to replace Soldiers. With the employment of this new technology, Soldiers will require new training, familiarization, licensing, and annual recertification to safely operate autonomous systems. Once certified, Soldiers will be able create and execute an autonomous convoy through a Warfighter Machine Interface tablet. The Warfighter Machine Interface allows a march unit commander to set a gap distance based on time, desired speed of the convoy, obstacle detection sensitivity, powertrain settings, and blackout drive modes. In the near term, M1075A2s equipped with Autonomous Transport Vehicle - System will

operate with one control vehicle consisting of a driver and march unit commander. This vehicle is designated as the march unit leader and will provide command and control to four autonomous trucks in the march unit. In the future, autonomous march unit size will increase and can be controlled externally with human off-the-loop controlled from a tactical operations center.

M-6. The Army will introduce the Common Tactical Truck within the next decade to modernize the existing heavy tactical wheeled vehicle fleet. The Common Tactical Truck will integrate modified commercial off-the-shelf solutions to perform current tactical wheeled vehicle mission roles. The heavy tactical vehicles set to be replaced by Common Tactical Truck include the PLS, HEMTT family of vehicles, and the line haul tractor (M915) as they have reached their design maturity and are entering their decline stage. The Common Tactical Truck will enable the Army to integrate modern capabilities, commercial technologies related to safety, and improve fuel economy. It achieves this through by-wire active safety and more efficient power trains. This increased commonality with commercial platforms will allow the Army to retain overmatch as well as benefit from commercial research and development. The Common Tactical Truck will also come with the ability to accept Autonomous Transport Vehicle - System kits, further increasing autonomous capabilities throughout the force.

M-7. The Medium-Modular Equipment Transport Trailer will reduce Soldier exposure to hostile effects and extend operational reach through ground resupply. It will operate autonomously, with a range of at least 85 miles on primary and secondary roads and will integrate with autonomous robotic applique kits and payloads, such as the Autonomous Transport Vehicle - System. By leveraging autonomous technology, the Medium-Modular Equipment Transport Trailer will provide a mode of ground autonomous resupply, enhancing force sustainment distribution, throughput, casualty evacuation, and efficiency while simultaneously enabling dispersed operations to achieve overmatch in current and future operational environments. The Medium-Modular Equipment Transport Trailer will primarily reside within FSCs, BSBs, and group support battalions operating in teams of two to constantly provide commodities to maneuver units.

Glossary

This glossary lists acronyms and terms with Army or joint definitions. Where Army and joint definitions differ, (Army) precedes the definition. Terms for which ATP 4-11 is the proponent are marked with an asterisk (*) before the term. For other terms, it lists the proponent publication in parentheses after the definition.

SECTION I – ACRONYMS AND ABBREVIATIONS

ADP	Army doctrine publication
AO	area of operations
AR	Army regulation
ATP	Army techniques publication
BSA	brigade support area
BSB	brigade support battalion
CBRN	chemical, biological, radiological, and nuclear
CFR	Code of Federal Regulations
COMSEC	communications security
CONUS	continental United States
CROP	container roll-in/roll-out platform
CSC	convoy support center
CSSB	combat sustainment support battalion
CTC	composite truck company
DA Pam	Department of the Army pamphlet
DD	Department of Defense (form)
DOD	Department of Defense
DSB	division sustainment brigade
DSSB	division sustainment support battalion
DTR	Defense Transportation Regulation
EAB	echelons above brigade
ESC	expeditionary sustainment command
FM	field manual, frequency modulation
FMTV	family of medium tactical vehicles
FSC	forward support company
G-3	assistant chief of staff, operations
G-4	assistant chief of staff, logistics
GCSS-Army	Global Combat Support System-Army
GVW	gross vehicle weight
HEMTT	heavy expanded mobility tactical truck
HET	heavy equipment transporter system

ITO	installation transportation office
ITV	in-transit visibility
JP	joint publication
LHS	load handling system
LMTV	light-medium tactical vehicle
MCB	movement control battalion
MCT	movement control team
MSR	main supply route
MTV	medium tactical vehicle
NATO	North Atlantic Treaty Organization
NCO	noncommissioned officer
OIC	officer in charge
POL	petroleum, oils, and lubricants
PLS	palletized load system
RFID	radio frequency identification
S-3	battalion or brigade operations staff officer
S-4	battalion or brigade logistics officer
SF	standard form
SOP	standard operating procedure
SPO	support operations
TB	technical bulletin
TC	training circular
TM	technical manual
TSC	theater sustainment command
TSOP	tactical standard operating procedure
TTP	trailer transfer point
TVAR	total vehicle availability rate

SECTION II – TERMS

***direct haul**

A single transport mission completed by the same vehicle(s).

***hub**

An organization that sorts and distributes inbound cargo from multiple supply sources.

hub and spoke distribution

A physical distribution system, in which a major port serves as a central point from which cargo is moved to and from several radiating points to increase transportation efficiencies and in-transit visibility. (JP 4-09)

intermodal operations

The process of using multiple modes (air, sea, highway, rail,) and conveyances (truck, barge, containers, pallets) to move troops, supplies and equipment through expeditionary entry points and the network of specialized transportation nodes to sustain land forces. (ATP 4-13)

***interzonal operations**

Operations which cross area of operation boundaries of a specific transportation organization and operate under the area control of more than one headquarters or command.

in-transit visibility

The ability to track the identity, status, and location of Department of Defense units, and non-unit cargo (excluding bulk petroleum, oils, and lubricants), and passengers, patients, and personal property from origin to consignee or destination. (JP 3-36)

***intrazonal operations**

Operations confined within a specific transportation organization's area of operation.

large-scale combat operations

Extensive joint combat operations in terms of scope and size of forces committed, conducted as a campaign aimed at achieving operational and strategic objectives. (ADP 3-0)

***line haul**

An operation in which vehicles cannot make more than one round trip per day due to distance, terrain restrictions, or transit time.

***local haul**

An operation in which vehicles can make two or more round trips per day based on distance and transit time.

***motor transport operation**

A ground support function that includes moving and transferring units, personnel, equipment, and supplies by motor vehicle to support operations.

operational environment

The aggregate of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander. (JP 3-0)

***relay**

A single transport mission completed in repeated trips by the same vehicles between two points.

***shuttle**

A single transport mission completed in one trip and utilizes multiple vehicles without transferring the load.

***spoke**

A portion of the distribution system that refers to the transportation mode operator's responsibility for scheduled delivery to a receiving unit.

tactical mobility

The ability of friendly forces to move and maneuver freely on the battlefield relative to the enemy. (ADP 3-90)

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16 March 2026

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PIN: 103560-000