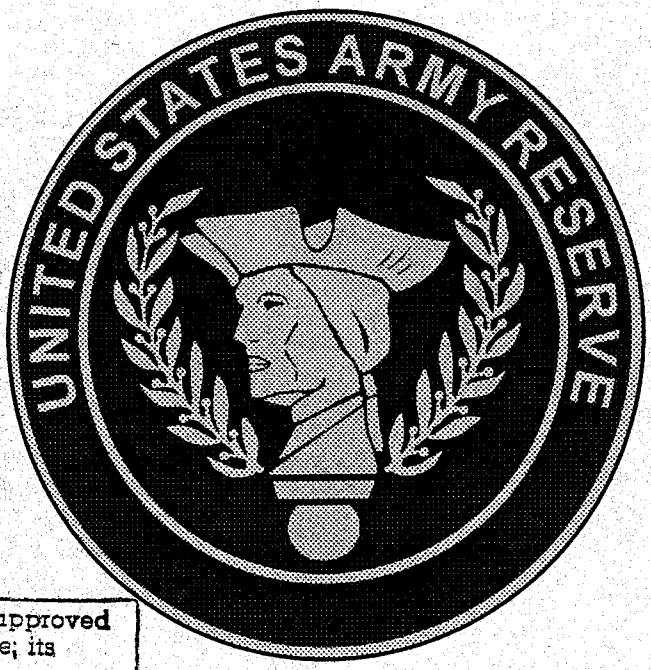
UNITED STATES ARMY RESERVE
IN
OPERATION DESERT STORM



Ground Transportation Operations

Adding Value to the Total Force and to the Nation

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FOREWORD

This is one of a series of monographs describing and assessing the role of the United States Army Reserve in the winning of the war in the Persian Gulf. Countless reports have been written and numerous books published about the coalition victory. None have appeared, however, that focus on the valuable contributions of Army Reserve soldiers and civilians to the favorable outcome of the conflict. This monograph and others in the series fill that void.

This report on the role of the Army Reserve in ground transportation operations in support of Coalition Forces demonstrates one of the core competencies provided to America's Army by Army Reservists. It is a description of the activation and success achieved by Army Reserve soldiers and units that had the mission to manage and move personnel, supplies, and equipment. It is a story of truckers, railroaders, terminal personnel, planners, and managers both in CONUS and the overseas theater making their contribution to the Total Force.

Other monographs have been issued describing the roles of a variety of Army Reserve units and individual soldiers. They include civil affairs, military police, engineers, medical, signal, infantry, intelligence, trainers, port units and individual Reservists. Future monographs will cover Army Reserve garrisons, logistics and administrative units. The entire group of monographs combine to form a comprehensive evaluation of the Army Reserve in Operations DESERT SHIELD and DESERT STORM.

Your comments on this and future monographs are most welcome.

FOR THE CHIEF, ARMY RESERVE:

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UNITED STATES ARMY RESERVE
in
OPERATION DESERT STORM

GROUND TRANSPORTATION OPERATIONS

DISCLAIMER STATEMENT

The views, opinions, and findings contained in this report are those of the authors and should not be construed as an official Department of the Army position, policy, or decision, unless designated by other official documentation.

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in
OPERATION DESERT STORM

GROUND TRANSPORTATION OPERATIONS

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UNITED STATES ARMY RESERVE
in
OPERATION DESERT STORM

GROUND TRANSPORTATION OPERATIONS

The Transportation Corps in Southwest Asia

The Movement to Attack Positions

The War with Iraq was a test of transportation capabilities. Hundreds of thousands of troops, thousands of tanks, combat vehicles, artillery pieces, and trucks had to be brought to the theater. Thousands of tons of cargo of great variety had to be loaded onto ships and aircraft in the United States, Europe, and other countries, moved to the Persian Gulf, unloaded at air and sea ports, moved inland to housing areas, office buildings, depots, assembly areas, and logistical support areas. Once the initial defense positions were established, it was necessary to move the troops, their equipment, ammunition and supplies to attack positions, then to haul it forward into Iraq and Kuwait as the attack moved swiftly to destroy the Iraqi forces and free Kuwait. Finally, after the victory, the people, equipment, and unused supplies had to be hauled back to the ports, reloaded onto ships and aircraft, and taken back to the points of origin for refurbishing and preparation for future use. All this took transportation: ships, aircraft, railways, and, above all, trucks--thousands of trucks of various kinds, makes, and models, moving continuously, erratically at times, but always moving to make possible the lightning success of the ground war.

There was no more impressive feat during the War with Iraq than the overland move of XVIII Airborne Corps and VII Corps from their initial defensive positions in Eastern Saudi Arabia to their attack positions in the West. This massive movement started in the early hours of 16 January 1991. While the world watched with awe the initial attacks of the air war against Iraq, the trucks, tractor-trailers, and heavy equipment transporters of the divisions, corps support commands, and the 7th and 32nd Transportation Groups started moving in a non-stop frenzy of convoys along Main Supply Route (MSR) Dodge hauling the troops, tanks, ammunition, POL, rations, water, and other supplies of the two U.S. combat corps into their positions for the ground war. While the attention of the American people was riveted on the sight of TOMAHAWK missiles hitting Baghdad, thousands of vehicles of various types and makes were moving night and day along Main Supply Route (MSR) Dodge the "Highway of Death" in trucker's jargon, transporting the XVIII Airborne Corps and the VII Corps from their initial locations to their attack positions for the start of the ground war.

This mammoth move had been planned meticulously but could not start until after the US and coalition air attacks had blinded the Iraqis. Surprise was a key element in General H. Norman Schwartzkopf's plan to make the main ground attack to the west, around the Iraqi defenses along the Kuwait-Saudi border. To assure surprise, no Coalition units were allowed to move to the west until after the air war started.

The facts and figures for this movement to attack positions are impressive--even startling. Two army corps with 190,000 US soldiers, 45,000 British and French troops, 95,000 trucks and other wheeled vehicles, 12,000 tanks or armored vehicles requiring heavy lift support, and large quantities of food, fuel, ammunition, parts, and other supplies, were moved several hundreds of miles in 21 days and nights of intense activity.[1] In this move, 1,400 US Army trucks and 2,100 host nation trucks drove over 35,000,000 miles in 3,568 convoys. This included 1,739 moves of tanks by heavy equipment transporters and 5,828 moves of other tracked vehicles by lowboys.[2] VII Corps units moved more than 330 miles, and those of XVIII Airborne Corps, about 500 miles.[3] The magnitude and distances involved in this massive movement exceeded by far those in the movement of Third Army under General George S. Patton in the breakout from the Normandy beachhead in World War II--previously the paradigm for rapid battlefield mobility.

Responsibility for carrying out this mammoth move rested with General William G. (Gus) Pagonis, Commander of the 22nd Support Command, and his Assistant Chief of Staff for Transportation, Colonel David A. Whaley. Moving the two U.S. corps into their attack positions and following them into Iraq and Kuwait to haul the tons of food, fuels, water, ammunition, and other supplies needed to sustain the fighting forces was the responsibility of the 32nd Transportation Group, an Army Reserve headquarters from Tampa, Florida, commanded by Colonel Michael T. Gaw. The 7th Transportation Group, an Active Component headquarters from Fort Eustis, Virginia, under the command of Colonel Daniel G. Brown, supported the 32nd Group by receiving equipment and cargo at the Ports of Dammam and Al Jubayl and moving the materiel inland to logistical support bases in Northeastern Saudi Arabia. From these log bases, truck companies of the 32nd Group moved the materiel to new log bases built to support the ground attack. Another Army Reserve unit, the 318th Movement Control Agency, Jamaica, New York, under the command of Colonel Peter C. Langenus, was the theater level transportation agency charged with coordinating all movement modes--sea, air, rail, and highway--in the theater, and matched requests for support from the Army, Air Force, Marine Corps, and Coalition Forces with transportation assets available from the two transportation groups.

The movement of the two corps was planned by a five person planning group working directly under Colonel Whaley. The concept was to move the entire XVIII Airborne Corps from its initial defensive positions in Eastern Saudi Arabia, simultaneously with the movement of the

VII Corps from its bases, to their final attack positions. Meanwhile, stockage of two new log bases with 60 days of supplies to support the attack would be accomplished. Since there was only one road available, this meant that the movement of XVIII Corps would cross the movement of VII Corps--a difficult accomplishment under ideal conditions. Under the conditions in the desert, it required split-second timing for unit convoys moving different directions to cross, all the while contending with local traffic. To complicate things even more, equipment for some of the VII Corps units was still arriving at the port and had to be moved directly to the attack positions.

After the planning group had done its work, the plan was briefed up the chain of command to General Pagonis, General Yeosock, Commander of Third Army, and General Schwartzkopf. Because of the critical importance of the movement to the ground offensive, after hearing the briefing and approving the plan on 29 December 1990, General Schwartzkopf required General Pagonis to sign a copy of the briefing slide with the 21 day movement schedule guaranteeing that it could be done.[4] Later, General Pagonis had Colonel Whaley also sign a copy of the plan with a guarantee of success.[5]

On 31 December 1990 and 1 January 1991, the 22nd Support Command celebrated the advent of the New Year by conducting a Logistical Exercise during which all logistical commanders briefed General Pagonis on their plans to support the upcoming offensive. Missions were briefed down to the company level. General Pagonis wanted to make certain that his entire organization knew what they were supposed to do.[6] General Pagonis' instructions to the 32nd Group and the other 22nd SUPCOM organizations supporting the ARCENT maneuver were simple: "This is what I need you to do. If you cannot do it, tell me. If you need help, ask me."[7]

The divisions had their own trucks to carry unit personnel and equipment, and the corps had their own truck companies in their support commands to carry much of their equipment and supplies. The 32nd Transportation Group would provide additional vehicles to augment the corps' assets and also to stock the new logistics bases that would be created for resupply after the attack had begun. The 32nd Group had about 700 medium trucks-tractors--each pulling a 20 ton trailer, about 1,000 heavy truck tractors with heavy equipment transport trailers or lowboys, and about 500 other trucks and busses of assorted types. The medium cargo trucks were employed primarily to move water, rations, ammunition, and other essential supplies to the new logbases and to the corps and divisions. The heavy equipment transporters (HETs) would be used to move tanks, armored fighting vehicles, and other tracked vehicles in order to save time and wear that would be incurred if they had road marched. The busses and trucks moved personnel and cargo in the local area around King Khalid Military City (KKMC) and along MSR Dodge.

To perform this mission, Colonel Gaw had four truck battalions with 25 truck companies-11 medium cargo and 14 heavy (HET). The 766th Transportation Battalion with six medium cargo truck companies supported the movement of VII Corps units and also moved supplies to the new log bases. The 369th Transportation Battalion with five heavy truck companies moved VII Corps equipment from the ports directly to the tactical assembly areas. The 1103rd Transportation Battalion, with five heavy truck companies, moved VII Corps heavy equipment from the ports and XVIII Corps heavy equipment to the attack positions. The Egyptian Truck Battalion, with four heavy truck companies, also moved heavy equipment of units moving to the front. The 185th Transportation Battalion arrived as the move was beginning and set up operations along MSR Dodge just before its four medium truck companies arrived and went into operation hauling cargo to the new log bases. So urgent was the need, that the drivers of the 185th Battalion arrived by air at Dhahran, picked up their trucks at Dammam, and were hauling cargo down MSR Dodge within 48 hours of their arrival in Saudi Arabia. That these Army Reservists and Guardsmen were able to do this is evidence of their readiness and determination.[8]

The critical part of the operation was moving the heavy equipment using HETs, lowboys, and flat bed trailers. Only real HETs could carry tanks and armored engineer vehicles. Lowboy trailers could carry the armored fighting vehicles, self-propelled field artillery vehicles, and engineer bulldozers. Flatbed trailers could carry some of the armored personnel carriers and lighter weight engineer equipment. It took 180 HET lifts and 253 lowboy lifts to move the entire 3rd Armored Cavalry Regiment over a period of nine days. The movement of the 24th Mechanized Division required a total of 1,277 heavy lifts--323 HETs, 445 lowboys, and 509 flatbed trailers.[9] One of the most important lessons learned from the war is the importance of having adequate heavy lift assets for armored vehicles.

Military history has many testimonials to the importance of transportation. Such feats as Hannibal crossing the Alps, Napoleon massing his dispersed corps rapidly on the city of Ulm in 1805 to surround its garrison and cause the surrender of 30,000 enemy troops, and Stonewall Jackson's "foot cavalry" moving fast enough to hold the Shenandoah Valley against larger Union forces in 1862, all attest to the military importance of the rapid movement of soldiers and supplies. The movement of XVIII Airborne Corps and VII Corps in January 1991 is one of the most impressive--and perhaps the most impressive--combinations of transportation power and combat power in history.

The Transportation Corps

It has been said that an Army travels on its stomach, and this is true, but the United States Army has for some time traveled on wheels. One of the first orders issued by General

George Washington as Commander of the Continental Army was to appoint in General Orders dated 9 August 1775, a Wagon Master General. In succeeding years, transportation remained important and became more complicated as mules, horses, and sailing craft gave way to steam vessels, railroads, motor vehicles, and aircraft. Many different parts of the Army and the War Department were responsible for some kinds and uses of transportation, and it was not until World War I that General John J. Pershing created a Provisional Transportation Corps for the American Expeditionary Force in France to achieve the benefits of central management of transportation assets. Following the 1918 Armistice, however, the Provisional Transportation Corps was disbanded despite its excellent performance in the war.[10]

The Transportation Corps was created again and as a permanent part of the Army on July 31, 1942, shortly after the Japanese attack on Pearl Harbor had brought the nation into World War II. During that global conflict the Transportation Corps operated ships and ports under often difficult conditions in the Aleutian Islands, India, Iran, and North Africa. It landed cargo over the beach where there were no ports. It built and operated railways, including a line across Iran to the Soviet Union. After the Allied landings in Normandy on 6 June 1944, the Transportation Corps operated thousands of trucks hauling cargo from ports to the troop units, including the famous Red Ball Express that hauled an average of 5,000 tons per day, for 81 days, to support General Patton's Third Army advance across France in August 1944. During the Korean War, the Transportation Corps introduced the helicopter to move supplies rapidly on the battlefield. In Vietnam, the Transportation Corps operated the ports and moved the supplies by truck to the US and South Vietnamese units fighting the Viet Cong and North Vietnamese forces. Over the years the Transportation Corps improved its equipment, refined its doctrine, and prepared its officers and enlisted personnel to serve the Army. These preparations paid off in the tremendous success of the transportation effort in the War with Iraq.[11]

Doctrine

The Transportation Corps has responsibility for movement of Army personnel, equipment, supplies and other cargo by all modes of transportation. In CONUS this function is carried out by the Military Traffic Management Command (MTMC) and installation transportation officers (ITOs) at all Army installations. MTMC along with the Military Sealift Command, and the Air Mobility Command, is a component of the unified U.S. Transportation Command (USTRANSCOM). Generally, MTMC is responsible for moving units and individual personnel and cargo from home stations in CONUS to sea and air ports of embarkation, where they are transported by aircraft and ships made available by USTRANSCOM to a theater of operations.

Transportation in the Theater of Operations

In the theater of operations, Transportation Corps units under the theater army commander are responsible for receiving units, cargo at a sea port of debarkation (SPOD), or an aerial port of debarkation (APOD). Incoming unit personnel and equipment are assisted in movement to assembly areas or forward positions by transportation personnel. Cargo is moved to depots or supply points, and then from the depots to using units. All modes of transportation--motor vehicle, aircraft, railway, and water craft--are used to move the units and cargo. The Transportation Corps is responsible for planning the movement, controlling it, and doing it.

Transportation Corps operations may be divided into four transportation modes: sea, air, railway, and highway, or motor transport. Each of these modes has a distinct set of units. In addition, the Transportation Corps performs movement planning and control.

Sea Operations

The Army role in sea operations is to operate terminals at sea ports or conduct over-the-shore movement of personnel, equipment, and supplies. The ships are operated by the Navy or chartered by the Navy. Terminal operations involve operating a port, loading or unloading ships, moving the personnel, equipment and cargo through the port to assembly areas or depots, and keeping track of arrivals and identities of people and cargo. In CONUS and for some overseas ports, this function is accomplished by Transportation Terminal Units assigned to MTMC. Port Operations under MTMC during Operations DESERT SHIELD and DESERT STORM were covered in another historical monograph.[12]

In a theater of operations, terminal operations are the responsibility of the Theater Army Commander, who usually performs this function for all U.S. forces and often for allies as well. Terminal operations are complex and require special operations and training. At the time of DESERT STORM, the U.S. Army maintained the following Transportation Corps units specifically for terminal operations:[13]

The Terminal Battalion Headquarters provides command and control for from two to seven transportation companies operating a sea terminal. The terminal battalion headquarters is designed to manage the simultaneous discharge of four ships at a port, or two at a logistics-over-the-shore (LOTS) site.

The Terminal Service Company is organized to discharge, backload, and transship cargo at water terminals at beaches or ports. There are two types of Terminal Service Companies, each having over 300 personnel, primarily stevedores. They are equipped with

materiel handling equipment (MHE) for unloading and loading containers or bulk cargo. Design capacity on a two-shift basis is 1,600 short tons of bulk cargo per 24-hour day. This type unit cannot handle containers in a LOTS operation unless augmented by a Heavy Crane Platoon.

The terminal transfer company or cargo transfer company is designed to move cargo and equipment from the docks or beaches to marshalling areas at the port ready for loading and hauling by truck companies or rail cars. It is equipped with materiel handling equipment (MHE) and specially configured yard tractors to move trailers short distances.

The freight consolidation and distribution detachment is designed to provide terminal services for a small port, airhead, railhead, or truck center.

The contract supervision detachment is designed to operate a small water terminal by contracting for personnel to discharge and clear cargo.

The cargo documentation detachment is designed to identify and mark 480 containers per day of cargo discharged or loaded at a water terminal, airhead, railhead, or truckhead.

In order to assist in terminal operations at ports and conduct logistics over the shore (LOTS) operations if necessary, the Army also maintains a fleet of watercraft for carrying equipment and cargo. These water craft are designed to facilitate discharge of cargo and equipment when port facilities are not adequate. They all feature front ramps that lower to permit trucks or tanks to drive off onto a beach. A few of these watercraft are capable of sailing over oceans, but many of them are carried to the theater of operations on special ships that can submerge partially to let the loaded barges float off. In addition to simply helping in port operations, these watercraft may also be used to carry equipment and cargo from one port to another within the theater as an intra-theater marine line of communication. Figure 1 shows the names and characteristics of the Army watercraft that were used in Southwest Asia during the War with Iraq. LCU is a landing craft utility; LCM is a landing craft mechanized; and the LSV is a logistical support vessel.

Army watercraft are operated by medium and heavy boat companies and a variety of specialized detachments. The medium boat company operates the LCMs and smaller LCUs, and the heavy boat company operates the larger craft. The LSVs and barge cranes are operated by individual detachments. Watercraft maintenance is performed by a specially configured watercraft maintenance company.

Figure 1.

Characteristics of Selected Army Watercraft[14]

Vessel	Cargo Tons	M1A1 Tanks	Range (N Miles)	Speed (Knots)	Waters
LSV	4,000	36	8,300	12	Ocean
LCU 2000	1,200	12	4,500	12	Ocean
LCM-8	420	7	270	9	Limited
LCU-1466	150	2	700	6	Offshore
Large Tug	n/a	n/a	3,300	12	Offshore
Barge Crane	100 Lift Ton	n/a	n/a	n/a	Harbor

Figure 2 shows the authorized strengths and rank of the commanders of selected terminal units.

Figure 2.

Characteristics of Transportation Terminal Units

	Off	Enl	Total	Cdr
Battalion Headquarters	20	68	88	LTC
Terminal Service Company Break Bulk	7	326	333	CPT
Heavy Crane Platoon	1	35	36	LT
Terminal Service Company (Break Bulk and Container)	6	351	357	CPT
Cargo Transfer Company	3	87	90	CPT
Cargo Transfer Company	5	233	238	CPT
Freight Consolidation Detachment	-	10	10	SSG
Contract Supervision Detachment	4	8	12	LTC
Cargo Documentation Detachment	-	8	8	SFC
Medium Watercraft Company	5	157	162	CPT
Heavy Watercraft Company	25	120	145	CPT
Logistics Support Vessel (LSV) Detachment	6	21	27	CWO

Air Operations

The air mode is important for transportation of personnel, equipment, and high priority cargo between the CONUS and the theater of operations (strategic airlift) and within the theater (tactical airlift). The US Air Force operates the military transport aircraft and manages the civil aircraft contracted to provide airlift. The Army part of air operations consists of arranging for Army passengers and cargo to be loaded at the aerial port of embarkation on the correct flights, and unloaded and distributed upon arrival at the aerial port of debarkation. To accomplish this mission, the Army has aerial port movement control detachments. Also, transportation truck companies may be assigned to the area support group in which the aerial port is located to

provide transportation to get passengers and cargo to the final destinations--or at least to the next point.

Railway Operations

Railways once were vitally important for military operations, and even recently supporting a NATO war in Europe would have relied extensively on the local railways, operated by commercial or national companies. During World War II, the U.S. Army had a significant number of railway units to operate railways in the Persian Gulf, Europe, and even the United States. Since World War II, however, the railway force structure of the Army has been reduced, so that in 1990 the entire capability of the U.S. Army for military railway operations resided in one battalion and one separate detachment of the United States Army Reserve. Parts of each of these units were employed in CONUS to support Operation DESERT STORM, and the Saudi Railways were also used extensively in Saudi Arabia. A discussion of the operations of USAR Railway Units in CONUS during the war is in Appendix A. Railway operations in Saudi Arabia are discussed below. Railway is an efficient way to move a large amount of cargo over long distances, provided the necessary infrastructure exists.

Motor Transport Operations

The mission of the Transportation Corps with respect to highway or motor transport operations is to provide truck companies to augment unit vehicles when needed to move the units themselves and to provide the supplies needed to sustain the units in their combat operations.

Almost all Army units have some organic vehicles to perform internal administration, supply, messing, and maintenance. Most vehicles assigned to units are small, including cars, utility vehicles, 2½ ton and 5 ton trucks, and high-mobility multipurpose wheeled vehicles (HMMWVs), but heavy vehicles are found in such units as engineer companies and maintenance companies. Tank, mechanized infantry, and artillery battalions are equipped for full mobility with enough organic trucks along with their tanks, armored fighting vehicles, and artillery prime movers to move the entire unit and a basic load of supplies at one time. Light and airborne infantry battalions do not have enough vehicles to be 100% mobile and rely on foot movement or additional vehicles for tactical mobility on the battlefield. Some support battalions and companies have sufficient vehicles to move themselves, but most support units require additional vehicles to move themselves, and all support units need help to move their supplies. The general rule in designing units is that the minimum number of organic vehicles required to perform the unit's mission will be allowed.

Vehicles needed to provide additional, common-user transportation are organized into five basic types of truck companies: light; light-medium; medium cargo; medium petroleum; and heavy.[15] There are some variations because of local needs and because of older equipment still in the hands of the troops.

The Light Truck Company is designed for local haul of both passengers and cargo within a logistical support base or port. It is equipped with sixty 2½ or 5 ton cargo trucks. The light truck company is assigned to the division supply and transportation battalion, corps transportation battalion, area support groups and similar logistical organizations, and transportation motor transport battalions. Most light truck companies are equipped with the preferred vehicle, the M923 5 ton truck. A light truck company with 2½ ton trucks can move 270 tons per day, a company with 5 ton trucks can move 540 tons per day, and both companies can move 1,944 passengers per day, all this assuming two round trips. Local haul capacity will be twice that of the long haul capacity cited above.

The Light-Medium Truck Company is designed to provide transportation for general, non-containerized cargo and for personnel. It has a mix of fifty 5 ton cargo trucks, 10 truck-tractors, and twenty-five 25 ton semitrailers. It can carry 360 tons of cargo per day and 720 passengers. Light-medium truck companies are assigned to area support groups and motor transport battalions. They provide basic truck support with some trailer capability for moving larger items than can fit into the trucks.

The Medium Truck Company provides the main long distance line haul capability in the theater. This company is equipped with sixty M915 10 ton truck-tractors--the same size and power of most of the huge civilian trucks plying the Nation's highways. The truck-tractors pull either cargo or tank semitrailers, depending on the kind of medium truck company. The cargo company has 120 cargo semitrailers, capable of carrying one 40 foot or two 20 foot containers used for shipping cargo on most ships. The petroleum company has sixty 7,500 gallon tank semitrailers. The medium truck companies are used for line-haul operations moving large quantities of cargo or POL from one logistical node (port, depot, support base) to another and are usually assigned to motor transport battalions at corps or echelons-above-corps (EAC). The corps versions of the medium truck company have smaller equipment: 5 ton tractors with 12 ton cargo semitrailers, and 5,000 gallon tank fuel semitrailers. The daily line-haul capacity of the EAC version is two hundred sixteen 20' containers, or 2,376 tons of cargo, 493,950 gallons of water, or 810,000 gallons of bulk POL products. To transport water, the cargo semitrailer is fitted with Semitrailer Mounted Fabric Tanks, each holding 4,750 gallons.

The Heavy Truck Company is designed to transport heavy or outsized vehicles--tanks, fighting vehicles, self-propelled artillery, and bulldozers--over long distances. The company is equipped with twenty-four 60 ton tractors and sixty 60 ton heavy equipment

transporter (HET) semitrailers. The company can carry 21 tanks or similar vehicles at a time.[16] Tracked vehicles are moved on HETS whenever possible primarily to save wear and tear on the tracks and the roads and also to speed up the movement of these vehicles.

Another important motor transport unit is the Trailer Transfer Point (TTP), which is located along an MSR to facilitate the turnover of trailers from one truck company to another. The idea is that a convoy from one truck company will travel from its point of origin to a trailer transfer point, drop its loaded trailers and pick up empty trailers to return to its original location, while another truck company picks up the loaded trailers and moves them to another trailer transfer point or final destinations. This system is designed to limit the operating range of a line-haul truck company to simplify maintenance and support of the trucks and drivers. Ideally, a trailer transfer point is located about every 90 miles along an MSR. The detachment, commanded by a lieutenant, receives and organizes the incoming trailers and assembles and dispatches the outgoing trailers. It is equipped with two "yard tractors" to move trailers around to organize outgoing convoys and is charged with performing limited maintenance of the trailers-changing tires and lubrication.[17] A TTP of 15 personnel is staffed for one-shift operations only, so that during DESERT STORM it was necessary to station two detachments at a single location to support round-the-clock operations.

Figure 3 shows the strengths and equipment authorized at the time of Operation DESERT STORM for selected motor transport units.

Figure 3.

Characteristics of Motor Transport Units[18]

	Off	Enl	Total	Trucks	Tractors	Trailers
Battalion Headquarters	10	40	50	-	-	-
Light Truck Company	5	165	170	60	-	-
Light-Medium Truck Company[19]	5	103	108	50	10	25
Medium Truck Company (Cargo)	5	174	179	-	60	120
Medium Truck Company (Petroleum)	5	170	175	-	60	60
Heavy Truck Company	5	146	151	-	24	24
Trailer Transfer Point	1	15	16	-	2	-

Allocation of Transportation Units in a Theater of Operations

Within a theater, the transportation units are grouped into two general categories: those that are assigned to transportation functional organizations, and those that are assigned to other combat service support organizations, most of them multi-functional in their responsibilities.

At the division level, one composite truck company is assigned to the main support battalion of the division support command (DISCOM). This truck company has a platoon of light trucks, a medium truck platoon, and two heavy truck platoons--a total of 56 trucks.

At the corps level, the transportation units are assigned to the corps support command (COSCOM). The COSCOM is organized into multi-functional corps support brigades that provide both direct support to designated divisions and area support to nearby units. During Operation DESERT STORM the alignment of companies was changed from functional into multi-functional battalions. Instead of the corps truck companies being assigned to transportation battalions, they were assigned to multifunctional corps support battalions. Many truck companies were assigned to quartermaster or ordnance battalion headquarters, and some of the transportation battalion headquarters were converted into corps support battalions. The 29th

Transportation Battalion, for example, was assigned to the 101st Corps Support Group of the 1st COSCOM supporting the XVIII Airborne Corps and included three truck companies, a supply company, a general support service company, a maintenance company, and a POL platoon. Truck companies within COSCOMs usually are equipped with smaller equipment than the EAC truck companies. Petroleum truck companies are equipped with 5,000 gallon trailers instead of the 7,500 gallon trailers, and there is a higher proportion of light and light-medium truck companies. Also, the Heavy Equipment Mobility Medium Trucks (HEMMT) and other equipment designed for cross-country movement in close support of the combat divisions, is found almost exclusively at the corps level.

At the EAC level, transportation is assigned on both a functional and an area basis. Truck companies are assigned to area support groups and area support battalions designed to provide a broad range of services to all units in a specified location. Truck companies and other transportation detachments are assigned either to the transportation functional command or the senior quartermaster POL headquarters in the theater.

Responsibility for distribution of petroleum products--primarily fuel for vehicles and aircraft--rests with the Quartermaster Corps. In a theater there is provision for a Quartermaster POL Group Headquarters that operates POL supply points and refueling centers. Transportation medium truck companies equipped with 7,500 gallon tanker trailers for hauling petroleum products are assigned to the Quartermaster Petroleum Group and to its subordinate petroleum operations battalions. These units operate more or less independently from the cargo line haul operation managed by the transportation battalions and groups, but since the same roads are used for all trucks, their operations have to be coordinated by the movement control system. In Southwest Asia, petroleum trucks did not move in large convoys, as was the practice for trucks hauling troops, equipment, or cargo, but instead moved by infiltration of groups of 3 to 5 trucks.

Transportation units that provide for air and sea terminal operations, rail operations, and long distance line-haul truck operations are organized into a theater transportation command, which is organized in turn into transportation groups, each commanding a set of transportation battalions. Prior to the Gulf War there were two basic kinds of transportation group headquarters. The terminal group headquarters specialized in port and LOTS operations; the motor transport group headquarters specialized in highway line-haul operations. The concept was that the theater transportation operations would be divided with one group responsible for unloading the ships at all of the ports and other groups moving the cargo and passengers inland to supply points. This distinction was important, for the skills and experience needed for terminal operations differ substantially from those needed for highway operations, and it took only a few personnel to perform the single function (a motor transport group was authorized only 53 personnel total). There was also a new kind of composite group headquarters that was staffed for both terminal and highway operations.[20] Within the transportation groups, the

battalions remain functional in their design. The strengths of the transportation command and the three kinds of transportation group headquarters are shown in Figure 4.

Figure 4.

Strengths of Transportation Headquarters

	Off	Enl	Total	Cdr
Transportation Command Headquarters	74	162	236	MG
Composite Group Headquarters	35	66	101	COL
Terminal Group Headquarters	26	61	87	COL
Motor Transport Group Headquarters	12	41	53	COL

Figure 5 shows the total number of transportation truck and terminal companies that were deployed to Southwest Asia and the major organizations to which they were assigned. About half of the transportation truck companies were allocated to the two corps support commands in roughly equal amounts, and the other half of the truck companies were allocated to the support command. At the support command level, the truck companies were organized into functional organizations, one for POL distribution and two for hauling general cargo and equipment. About 35% of the total truck companies were utilized for line-haul operations under two transportation groups.

Figure 5.

Allocation of Transportation Companies in SWA

	Third Army (ARCENT)						
	XVIII Corps	VII Corps	Supcom ASGs	POL Group	7th Group	32nd Group	Total
Light Truck	1		1		1		3
Lt-Med Truck	9	3	1		6		19
Med Truck (Cargo)	9	8	2	1	12	11	43
Med Truck Petroleum	5	12		11			28
Hvy Truck	5	5				10*	20
Terminal					9		9
Watercraft					2		2
TOTAL	29	28	4	12	30	21	124

* Five companies were converted to heavy truck companies using commercial equipment.

Movement Control

Another important transportation function in the theater of operations is movement control, which seeks to match requests by users of transportation with the providers of transportation.

Movement control is concerned with the broader aspects of movement involving the maneuver of the combat commands as well as the movement of personnel, supplies, and equipment that is inherent in combat service support. Movement control is important both to the operations staffs who perform tactical movement planning and logistical staffs who plan for sustainment of the combat elements. Planning and management of movement requires close coordination among commanders and staffs of all organizations in the theater.[21]

The general concept is that the movement control system receives requests for transportation support from organizations whose movement needs exceed their own capabilities. The movement control system matches demand for transportation against available assets and tasks the transportation mode operators to provide support to the requesting units. The connection between requestors and suppliers of transportation is made at the division level, the corps level, and on an area basis at EAC. Normally a major movement control headquarters--battalion--will be assigned to receive requests for an area also serviced by a transportation group headquarters. The movement control agency for the theater allocates EAC transportation assets among the corps and various EAC requestors, and looks for ways to make up for the inevitable shortfalls in total transportation capability.

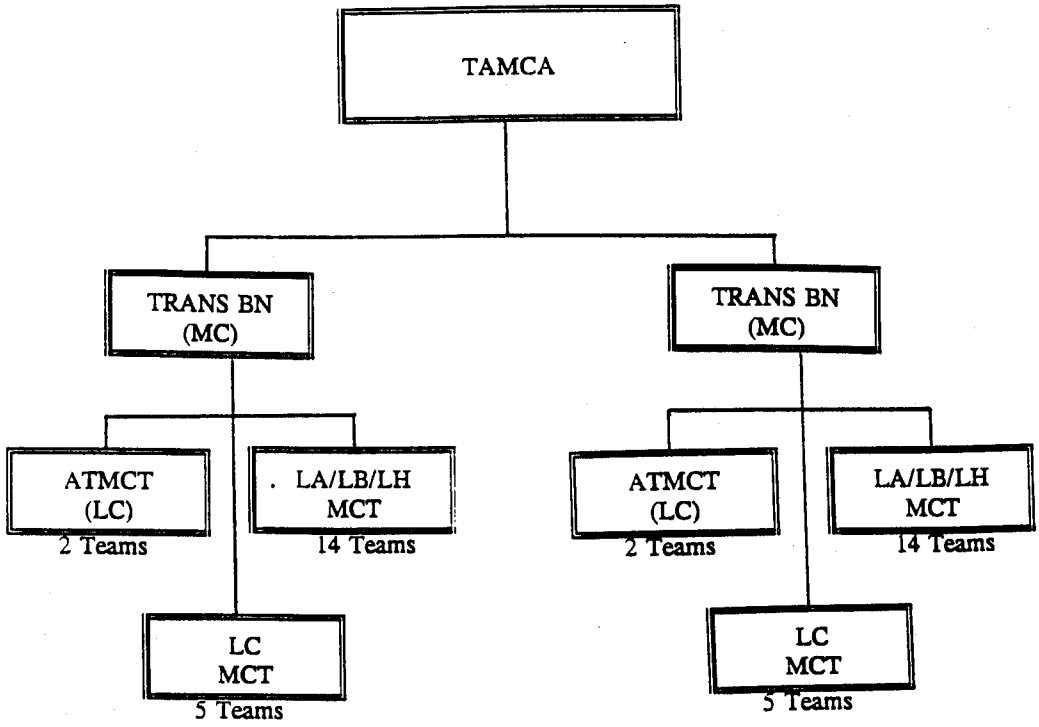
The Theater Movement Control Agency (TAMCA) has a broader field of interest and a higher level of interaction than the theater transportation command. The theater movement control agency is concerned with all modes of transportation, while the transportation command is primarily interested in sea and highway operations. The transportation movement control agency must deal with the Air Force, Navy, Allies, and the Host Nation to provide transportation services and obtain transportation support. As such, the TAMCA represents the Army component commander on the Joint Transportation Board established to allocate transportation resources among component commands in accordance with the theater commander's priorities.[22]

In order to accomplish its mission, the movement control organization in a theater must have accurate, timely information on the location and status of transportation assets. This is needed to assure that available assets are used efficiently and in accordance with priorities established by the theater commander. The movement control teams are dispersed within the theater at important locations to report when transportation tasks have been accomplished and what transportation assets are available at any given time to undertake new tasks. One important aspect of movement control, therefore, is the maintenance of data on existing assets.

Movement control is accomplished by a separate chain of command paralleling the transportation operations structure. Figure 6 shows the doctrinal arrangement for movement control and transportation operations.

Figure 6.

Doctrinal Theater Army Movement Control Structure



At division level, the movement control function is exercised by the DISCOM Movement Control Officer, who tasks the DISCOM truck companies and places requests for additional transportation assets with the corps movement control battalion.

At the Corps level, movement control is a responsibility of the COSCOM, and a movement control battalion is assigned for that purpose. The corps movement control battalion receives requests from the divisions and other corps organizations for transportation support in excess of their own capabilities and tasks the corps support groups to provide that support. The corps movement control battalion also requests additional transportation support from the movement control battalions and agency at EAC.

At the theater level, the senior movement control headquarters is a movement control agency, commanded by a brigadier general. The TAMCA is assigned directly to theater army

headquarters or, as was the case for Operation DESERT STORM, to the theater army area (support) command. Doctrinally, the TAMCA is co-equal with the theater transportation command. The TAMCA may include movement control battalions as major subordinate elements.

The movement control function is accomplished by movement control detachments assigned to the corps movement control battalions or at EAC to the TAMCA. There are several different kinds of movement control detachments, each organized for a specific purpose. These detachments provide movement control teams at important logistical nodes and also along the MSRs. The movement control detachments in the force structure in August of 1990 were as follows:

Detachment LA is designed to provide a MCT for a single shift at an intermediate highway regulating point, small army airfields, or specialized supply installations. It may also augment another movement control team.

Detachment LB is designed to provide a MCT for a single shift at a two-ship LOTS terminal or for one or two ships at a port. It may also be used inland.

Detachment LC is designed to provide a MCT for a single shift at a general support supply or maintenance facility or highway or rail terminal or four-ship port.

Detachment LD is a headquarters designed to provide command and control for up to ten subordinate movement control teams (MCT) and perform the movement control function for a corps or for a specified region within EAC. At the outset of Operation DESERT STORM, these were named movement control centers or regions, but they were all established as battalions in the theater. Detachment LE does the same, but only for a single shift.

Detachment LF is designed to provide a MCT for 24-hour operations to coordinate the clearance of Army cargo and passengers from Air Force air terminals.

Detachment LG is designed to provide a MCT for 12-hour operations to coordinate the clearance of Army cargo and passengers from Air Force air terminals.

Detachment LH operates a highway regulating point to coordinate the movement of traffic along an MSR and make changes in truck or convoy routings.

The strengths and rank of commanders of movement control units are in Figure 7. These units tend to be small, and most are configured for one-shift operation only. One important feature is that all movement control detachments except LA have at least one officer, presumably

to provide the authority needed to get cooperation along the MSRs and at air and sea ports where the teams function somewhat autonomously.[23]

Figure 7.

Characteristics of Movement Control Units

	Off	Enl	Total	Commander
Movement Control Agency	27	54	81	BG*
Movement Control Battalion	8	29	37	LTC
Movement Control Det LA	0	3	3	SFC
Movement Control Det LB	1	4	5	LT
Movement Control Det LC	1	6	7	LT
Movement Control Det LD (Region)	4	9	13	MAJ
Movement Control Det LE (Region)	3	6	9	MAJ
Movement Control Det LF (Air Terminal)	10	25	35	MAJ
Movement Control Det LG (Air Terminal)	6	13	19	MAJ
Movement Regulation Det LH	1	3	4	LT

* The commander of the 318th Movement Control Agency that was deployed in the Gulf War was a Colonel.

Materiel Management Centers

Although not transportation units, the materiel management centers (MMC) at division, corps and EAC also have direct influence on the movement control function. The job of the MMC is to manage supply and maintenance support and assure that using units have adequate stocks of necessary items and consumables. MMCs exist at the same levels as movement control

centers, and there is an MMC in the division support command, the corps support command, and the theater army area (support) command.[24] The MMC and the MCC are intended to work closely together. The MMC determines what is to be provided where, and the MCC moves it there. The MCC is concerned with containers, and the MMC is concerned with what is inside the containers. This dual system of control, as might be expected, led to considerable tension during Operation DESERT STORM as the interests of the MCCs and MMCs diverged.

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The remainder of this historical case study deals with the operations of the transportation elements at EAC organized into the two transportation group headquarters and a theater movement control organization--all operating under the 22nd Support Command. The operations of transportation units--primarily truck companies--in the corps support commands, area support groups, and the 475th Quartermaster Petroleum Group will be covered in subsequent monographs.

The Southwest Asia Theater

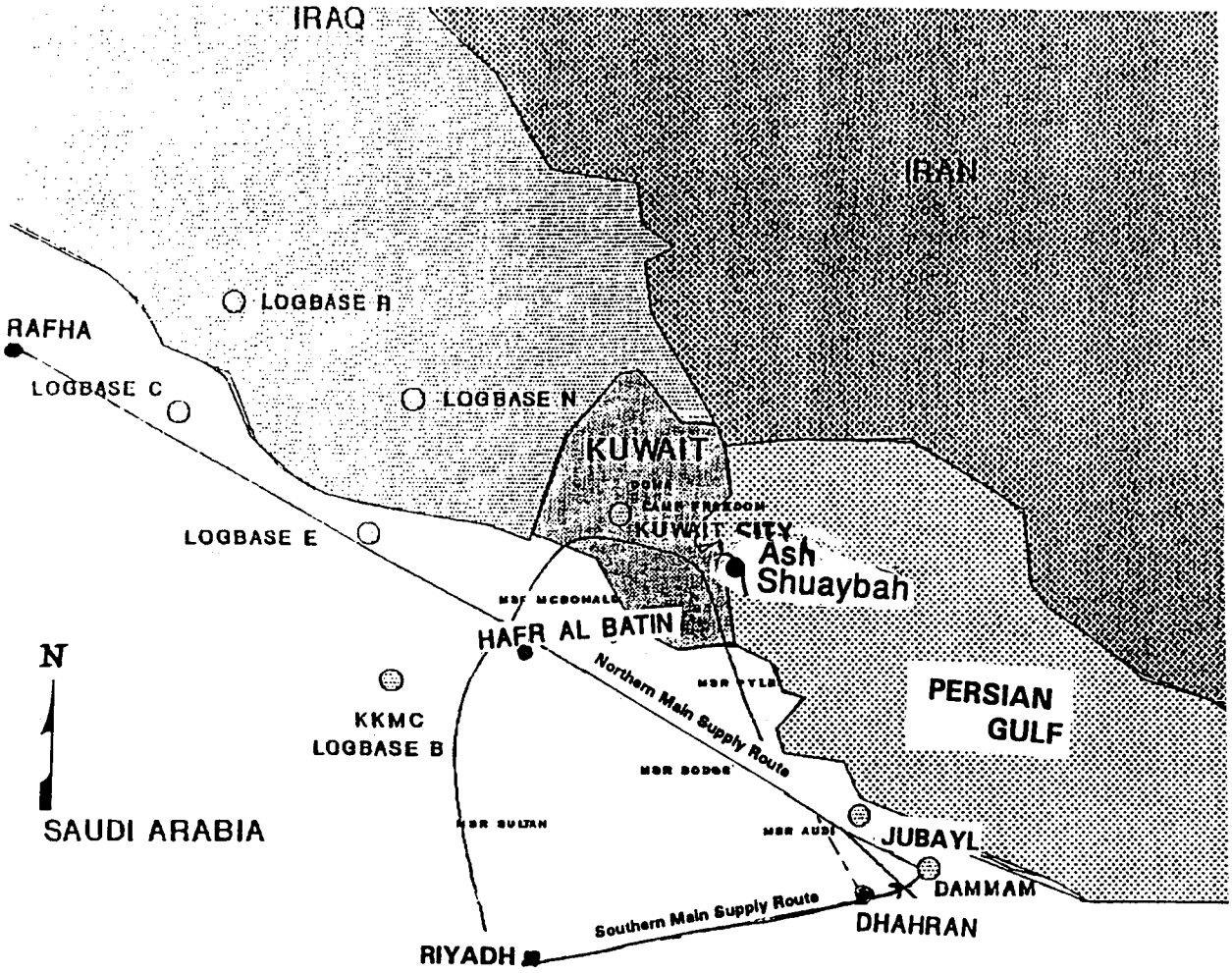
From a transportation viewpoint, the Southwest Asia Theater was a challenging environment even for routine operations. But when the austere environment was coupled with a CINC who insisted first on a massive buildup of forces and supplies and then planned a campaign dependent on rapid, wide ranging movement for success, the situation turned out to be a transporter's dream--or nightmare.

Fortunately, the existing facilities were modern and capable of supporting the operation. Figure 8 is an outline map of the theater of operations in Saudi Arabia showing the major transportation features.

The main ports were Dammam, near Dhahran, and Al Jubayl in Saudi Arabia, plus some minor ports in Bahrain, Oman, and later on, Kuwait itself. These were modern ports with good berthing and unloading facilities, capable of handling several ships at a time. Dammam was the primary port and in excellent condition. Al Jubayl was also in good condition and served well as a major secondary port. Other ports, including Jeddah and Yanbu, on the Red Sea, as well as Bahrain and Doha, on the Persian Gulf, were also used for small quantities of equipment and supplies.

Figure 8.

Map of Transportation Features in Saudi Arabia



The only railroad in Saudi Arabia ran from Dammam and Dhahran westward 225 miles to Riyadh, at a right angle to the main northern thrust of the threat and attack, but as it turned out still useful. The railroad track was in good condition and there were adequate amounts of engines and rolling stock available also in good condition and under excellent Saudi management.

Roads were the most important and least available transportation asset. There were two primary main supply routes (MSRs) leading from the ports to the logistical support bases (log

bases) established to the Northwest just South of the border with Kuwait and Iraq. The northern route ran north from Dammam/Dhahran to Al Jubayl and then northwesterly to the towns of Hafr Al Batin, Rafha, and beyond. This northern route was a modern four-lane highway for 85 miles (about Al Jubayl) and then became a narrow two-lane road in poor condition for another 250 miles. Since this road ran along the trace of the old Trans-Arabian Pipeline, it was called the Tapline Road. The southern route ran westward from Dammam/Dhahran to Riyadh and then north to King Khalid Military City (KKMC) and an intersection with the Tapline Road just west of Hafr Al Batin. For the first 226 miles (to Riyadh) this was a modern four lane road, and from Riyadh north it was a two-lane road with good shoulders for another 300 miles. The distance to the intersection of the two routes from Dammam was 334 miles by the northern route and 528 miles by the southern route, but the time of travel by truck was about the same because of the differences in the road conditions.[25]

There were in Saudi Arabia large quantities of civilian vehicles--cars, buses, trucks--and also of road construction equipment and materials on hand. As was Saudi practice, these transportation and construction assets were operated by local or foreign contractors using mostly third country nationals as drivers, mechanics, and laborers.

The challenge of supporting the Army and the other Services and Coalition Allies was one which the Transportation Corps met head on, with a mix of solid, doctrinally based performance and brilliant improvisation. The results, as we shall see, were good.

The 7th Transportation Terminal Group

Once the decision was announced on 8 August 1990 to send US military forces to Saudi Arabia, the pipeline of units, equipment, and supplies was opened, and the passengers and cargo started to flow to the theater. Crews, longshoremen, and transportation cargo specialists started loading ships in CONUS. Pre-positioned ships stationed at Diego Garcia for just such a contingency started moving to Dammam and Al Jubayl with their stocks of equipment and supplies. It was a push system, and once the people and cargo started arriving in Saudi Arabia, they would continue to arrive in ever expanding amounts. However, there was no one on the receiving end to unload the ships and direct the passengers and cargo out of the ports. There was no one at the receiving end of the push.

Major General William G. Pagonis knew this and was trying to get some transportation troops in the theater to take care of the business end of the pipeline. General Pagonis himself had arrived in the theater on 8 August and was put in charge of logistical support for the theater. He knew well that he had to get some people on the ground to organize the ports and get the

ships unloaded, both to make way for the next day's ships and also to set up the supply bases and depots that would be needed to sustain the troops in their daily living and in the event of Iraqi attack. However, the staff officers in charge of regulating the flow of troops into the theater had firm orders from General Schwartzkopf to bring in combat troops, and even the support elements of the XVIII Airborne Corps were being deferred. In fact, the twenty hand-picked logisticians to form General Pagonis' provisional support command headquarters were having a hard time getting on flights to Saudi Arabia. He was greatly relieved then to receive the first of the transportation troops to arrive. As General Pagonis put it:

> "So by the end of August 11th, I was at the end of my tether. I needed some good news--and all of a sudden, I got some. Into my office walked a closely cropped, barrel-chested colonel who introduced himself as Colonel David Whaley, commanding officer of the 7th Transportation Group from Fort Eustis, Virginia, reporting for duty with 300 stevedores in tow. Whaley's timing was perfect: the first of the six prepo ships from Diego Garcia was due in two days. The unloading of these ships would be an absolute priority, since they contained all of the supplies necessary for our survival as a military force."[26]

Colonel Whaley and his hardy band of stevedores were the first of the thousands of Transportation Corps Troops to serve in the theater before, during, and long after the air and ground campaigns. They had arrived in Saudi Arabia on 10 August 1990 as the advance party of the 7th Group, with selected officers and NCOs from the 6th Transportation Battalion and the 10th and 24th Terminal Battalions. Initially, many of these personnel were "drafted to help form the fledgling SUPCOM staff. For several weeks, lieutenants did the jobs of colonels and sergeants did the jobs of captains."[27] Eventually, as additional troops arrived, the officers filtered out of the SUPCOM and made their way back to their own units.

One of the first things the 7th Group had to do was establish an orderly process to receive and move the soldiers, sailors, marines, and airmen arriving in ever increasing numbers at Dhahran Airfield. The first large mission was to move 8,000 marines from Dhahran to their assembly area near the port of Al Jubayl. Because of the initial shortage of military transportation, the 7th Group was forced to round up large numbers of local buses to move the passengers and their personal equipment. This was but the first of many improvised solutions that had to be adopted to get the job done.

Another urgent requirement was to prepare the ports at Dammam, and then at Al Jubayl, to receive and unload the large number of ships coming in loaded with military equipment and cargo. Then, although the 7th Group's specialty, for which it was organized and trained, was terminal operations, the headquarters also had to conduct motor transport operations to clear the port of cargo by moving the materiel to inland supply points. Finally, the group conducted long-

distance line haul operations using medium trucks to carry cargo, and heavy equipment transporters to carry heavy armored vehicles, to the logistical support bases and troop areas that were being formed to support the forthcoming offensive operations.

At peak strength, the 7th Transportation Group had 9,200 soldiers, organized into 100 units--52 Active, 23 Army National Guard, and 25 Army Reserve.[28] It included 25 military truck companies and five provisional truck companies equipped with a variety of commercial vehicles, some operated by contractor personnel. It included also a converted air defense battalion task force whose personnel were retrained to accompany host nation and third country drivers and/or drive a fleet of Czechoslovakian trucks furnished by the German Government. The major subordinate elements of the 7th Transportation Group just prior to the start of the ground war are shown in Figure 9.[29]

Figure 9.

Composition of the 7th Transportation Terminal Group

Unit	Component	Home Station
7th Transportation Group HQ	AC	Fort Eustis, VA
10th Terminal Battalion	AC	Fort Eustis, VA
24th Terminal Battalion	AC	Fort Eustis, VA
68th Transportation Battalion (Truck)	AC	Fort Carson, CO
180th Transportation Battalion (Truck)	AC	Fort Hood, TX
419th Transportation Battalion (Truck)	USAR	Bartonville, IL
702nd Transportation Battalion (Truck)	Provisional	
Task Force 2nd Battalion, 3rd Air Defense	AC	Fort Lewis, WA

The first job was to get the ports in business, and this was the task of the two terminal battalions: the 24th and 10th. Basically, the 24th Terminal Battalion handled the terminal

operations at Dammam, and the 10th Terminal Battalion handled the watercraft operations at Dammam and both terminal and watercraft operations at Al Jubayl.

24th Transportation Battalion (Terminal)

Responsibility for unloading and transhipping equipment and cargo from Dammam was with the 24th Transportation Battalion, commanded initially by LTC James S. Ebertowski and after November 1990, by LTC Donald D. Parker. The composition of the 24th Battalion is shown in Figure 10.

Figure 10.

Composition of the 24th Transportation Battalion

Unit	Component	Home Station
24th Terminal Battalion	AC	Fort Eustis, VA
264th Terminal Service Company	AC	Fort Eustis, VA
551st Terminal Transfer Company	AC	Fort Eustis, VA
567th Terminal Service Company	AC	Fort Eustis, VA
685th Terminal Transfer Company	USAR	Gary, IN
4th Battalion, 16th Infantry	AC	Goeppingen, GE

The 551st Terminal Transfer Company was the first company to arrive and was assigned initially to operate an Arrival/Departure Airfield Control Group at Dhahran Air Base to receive and move 8,000 Marines to their assembly area at Al Jubayl and receive the over 5,000 soldiers that were arriving each day.[30] The 7th Group staff also worked at the field, arranging for host nation support trucks and buses to move passengers and cargo to their designated areas. The arrival at the Port of Dammam of three LASH vessels, each with 80 barges loaded with ammunition led to the shift of the 551st from the airfield to the port of Dammam to supervise the storage and movement of the ammunition. Since the 24th Battalion did not have its terminal service companies in the theater yet, it contracted for laborers to discharge ammunition from the barges. This was difficult and frustrating, for many of the laborers did not speak English and they did not understand the hazards of working with ammunition.

The battalion grew as additional terminal units arrived. By the end of August, the 567th Terminal Service Company arrived from Fort Eustis, and started to unload the Fast Sealift Ships that were arriving from CONUS with unit equipment. In December, the 264th Terminal Service Company arrived from Fort Eustis. The 264th was a Type B unit, having only a small cadre of active troops and designed to be filled to strength by the addition of local hire civilians, but augmented by local laborers, it went to work unloading ships. The 685th Terminal Transfer Company, Army Reserve, Gary, Indiana, joined the 24th Transportation Battalion in February, 1991, just in time to help load and brace ammunition for movement forward to support the imminent ground operations.

Cargo documentation was a major activity, for it was important to identify each piece of equipment, each container, and each pallet of ammunition so that it could be directed to the proper destination. The first two units were the 358th and 491st Cargo Documentation Detachments, Active units with about 40 trained specialists each. These were augmented in September 1990 by another 115 documentation specialists from 15 separate detachments of all Components.

In late December, 700 personnel of the 4th Battalion, 16th Infantry Regiment arrived at Dammam from Germany to work for three months as a Port Support Activity (PSA) providing security, and facilities support. The infantrymen of the 4/16th worked hard and enthusiastically to support the port operation--an operation that by mid-January 1991 was fast and frantic. The port was busy. Over 200 containers were being shipped out each day; 10,000 soldiers lived in warehouses waiting to be moved to their desert locations. Ammunition of all kinds and sizes was coming in large quantities, including large quantities of Air Force munitions to support the upcoming air war.

10th Transportation Battalion (Terminal)

The mission of the 10th Transportation Battalion was to conduct terminal service operations at Al Jubayl, provide harbor craft support for Al Jubayl and Dammam, and starting in February 1991, operate a marine line of communication (LOC) along the western coast of the Persian Gulf.[31] The "Boat Battalion" in peacetime commanded the Army's fleet of water craft for port and logistics-over-the-short (LOTS) operations, including tug boats to help large ships dock, barge mounted cranes for lifting and moving equipment and cargo, and several types of vessels with front ramps for loading and unloading tracked and wheeled vehicles from beaches.

Immediate action was taken to provide water craft support for the impending heavy work load at Damman and Al Jubayl. In August 1990, a surge team of 80 members of the 10th Terminal Battalion arrived in Saudi Arabia to receive water craft that were arriving on pre-

positioned ships and get them into operation. On 29 August 1990, the surge team started downloading the American Cormorant, which carried two landing craft medium (LCM), four large tugs, four landing craft utility (LCU), and two 100 ton barge derricks (cranes). Other prepositioned ships brought in two barge mounted water purification units, and two more LCMs. All but three of these craft were put into operation. On 14 August 1990, the first of two Logistics Support Vessels (LSV), a large front ramp ship, deployed, and the second LSV deployed two weeks later. These ships sailed from Fort Eustis directly to the Persian Gulf carrying essential material handling equipment for port operations.

The battalion tailored its organization to meet the mission. Except for the headquarters and headquarters detachment, none of the peacetime units deployed intact, although all were represented.[32] The original surge team and additional expansion crews that arrived in August and September were formed into the provisional 703d Transportation Company. The 97th Heavy Boat Company arrived in February with additional LCUs. The configuration of the battalion at the start of the ground war is shown in Figure 11.

Figure 11.

Composition of 10th Transportation Terminal Battalion

Unit	Component	Home Station
10th Transportation Battalion HQ	AC	Fort Eustis, VA
97th Heavy Boat Company	AC	Fort Eustis, VA
703rd Boat Company (Provisional)	AC	Fort Eustis, VA
335th Transportation Detachment (LSV-1)	AC	Fort Eustis, VA
1099th Transportation Detachment (LSV-4)	AC	Fort Eustis, VA

Additional water craft were deployed after the initial increment, and the total number of water craft in the theater is shown in Figure 12. These watercraft were kept busy on a variety of tasks. The tugs proved more adept at moving barges than local port tugs. LCMs and LCS were used to carry waterborne weapons firing ranges, move vehicles and materials handling equipment (MHE) to Al Jubayl to help that port receive VII Corps, and particularly to move tanks and other heavy vehicles from Al Jubayl to Dammam during the redeployment phase. The

LSVs transported munitions to ports close to airfields, including Bahrain, Oman, and Qatar. They also helped unload equipment from ships in Dammam by removing tanks by crane and then moving them to a roll-on-roll-off ramp at the port for the tanks to drive off. Army watercraft augmented local port craft, and Army crews learned to operate host nation equipment to keep that equipment going at full capacity. During the operations of the marine LOC, there was concern about floating mines and some problems with rough seas, but the Army craft came through, providing considerable assistance to the Navy and Marine Corps as well as the Air Force and Army.

Figure 12.

Army Watercraft Operated in Southwest Asia

2	LSV
1	LCU 1466
4	LCU 2000
7	LCM-8
3	Large Tug
2	Barge Derrick Crane

The 419th Transportation Battalion (Truck)

The 419th Transportation Battalion (Truck) Headquarters, USAR, commanded by Lieutenant Colonel John Gannon, arrived in Southwest Asia on 31 October 1990. The battalion was assigned to the 7th Group and for the rest of 1990 worked primarily at clearing the port of Dammam by taking ammunition and other cargo from the piers to supply points and logistics bases inland.[33] During the preparation for offensive action, the battalion helped the 82nd Airborne Division and the 1st Cavalry Division move to the west. During the entire combat phase, the battalion hauled ammunition from the logistics bases to forward supply points and to the using units. Air Force munitions were hauled from Dammam to Al Kharj and King Fahd Air Bases, and munitions were moved to the US and British ground forces. Much of this ammunition was delivered less than 24 hours before it was used. After the cease fire, the battalion hauled humanitarian supplies to Kuwait and supported the redeployment of the 82nd Airborne Division and French forces. In all, the 419th hauled 290,000 tons of cargo over 5,600,000 miles. During this time the unit had only 41 vehicle accidents, none of which caused serious injury or death.

The composition of the 419th at its greatest strength is shown in Figure 13. The 253rd Light-Medium Truck Company and the 619th Medium Truck Company were assigned to the battalion briefly in January 1991, while the other units remained under the battalion during the entire operation. During the buildup for the combat phase, some of the battalion elements--platoons or companies--were placed under the operational control of divisions to support their movement to the west. For example, elements of the 180th and 1122nd Transportation Companies supported the move of the 82nd Airborne Division, and the 131st Transportation Company supported the movement of the 1st Cavalry Division. Later, during the ground war, elements of the battalion were placed under the operational control of the 82nd Airborne Division and the Tiger Brigade.

Figure 13.

Composition of 419th Transportation Battalion

Unit	Component	Home Station
131st Medium Truck Company	ARNG	Williamstown, PA
180th Medium Truck Company	USAR	Grand Rapids, MI
253rd Light-Medium Truck Company	ARNG	Cape May, NJ (OPCON)
619th Medium Truck Company	USAR	Auburn, ME
639th Medium Truck Company	ARNG	Kingsport, TN
1122nd Light-Medium Truck Company	ARNG	Monticello, AR
1461st Light Truck Company	ARNG	Jackson, MI
544th Trailer Transfer Point	AC	Fort Eustis, VA

*Note: In January 1991, the 131st Medium Truck Company was assigned to the 766th Transportation Battalion in the 32nd Transportation Group.

The strength of the battalion averaged about 900 soldiers, with a peak strength of 1,234 personnel in January 1991. The battalion was augmented by the assignment of 276 active and IRR fillers. The battalion headquarters deployed with 51 personnel, over 100% strength.

The 419th Transportation Battalion had the usual problems to be expected of a unit operating in a fast moving situation in an austere environment. Maintenance of up to 350 vehicles was a challenge because of problems in obtaining repair parts and obtaining maintenance

support. The direct support maintenance units changed three times in three months, forcing the battalion to reorder parts each time. Also, some of the supporting maintenance units were themselves without repair parts, having deployed without their authorized stockage level of parts. Maintenance of commercial vehicles was a particular challenge because of non-standard parts and unavailable manuals. The ability to purchase parts on the local market using a blanket purchase agreement (BPA) saved the day for both military and commercial vehicles. Despite these problems, the battalion's units maintained an 89% operational readiness rate over the six month period.

The 419th Commander, then-LTC Gannon, is particularly critical of the poor communications available to the unit. The unit used a mix of military radios, commercial phones, field phones, and TAC lines to communicate, but these proved to be inadequate and unreliable. The military radios were too few in number and too weak in range to assist in control during line-haul operations. Essentially, once convoys departed the log base there was no way to get information directly to them. To try to transmit changes to them, or warn them of a contaminated area through which they would pass, or get emergency information to them, was well nigh impossible. The only hope was that messages left at MP check points or at other log bases would be handled by conscientious people who would get the message through.[34]

The 544th Trailer Transfer Point Detachment set up a trailer transfer point at Dammam initially, then moved to a field site to establish a trailer transfer point (TTP) there during the great movement west. Although the requirement was to operate the point around the clock, this was difficult with only 16 personnel in the unit. The solution was to combine two or more detachments at a TTP so as to accommodate around the clock operations and also to augment these with mechanics for trailer maintenance required. The unit, however, was not able to conduct really effective maintenance on the trailers because of the shortage of maintenance personnel and parts.

During the buildup for the DESERT STORM ground offensive huge amounts of ammunition were coming into the country. That was the major cargo the 419th hauled from the port of Dammam to different log bases. However, forward logistical commanders and tactical commanders would not unload the trailers. They wanted the ammunition loaded and ready to go with them when the attack began. They wanted their own mobile ammunition supply points. After a few weeks this led to problems since the number of empty trailers available for cargo was getting less and less. They were needed to clear the port, because the ammunition was piling up there after unloading from the ships. It was even becoming dangerous. In late January 1991, there were 40,000 tons of ammunition on the docks, where it was collocated with people and was a great hazard to the people, to port facilities such as the docks, and to the shipping that was at the docks every day. Had the ground war continued for another week or so the trailer shortage would have become a "war stopper". It became so serious that senior people were

looking for trailers by vehicle and aerial reconnaissance.

Even if the battalion had the trailers, they might not have been able to continue hauling with them, since a new problem cropped up. The people being served by the transportation units really coveted the webbed tie-downs that hold the cargo steady on the trailers. They came with ratchets so they could be cinched tightly around heavy cases which could otherwise shift and break through the wooden sides of the trailers. As trailers were unloaded, the tie-downs and ratchets were kept and were not returned with the returning empty trailers. Combat arms people and people in the forward logistical bases used these for their own transportation needs, and the supply of tie-downs for the line-haul trailers got critically short. In fact, 419th personnel opined they would have become a "war stopper" too. The battalion had requisitions in to the States for 3,500 of these at one time. Over the course of the months the battalion was there, they received about 30,000. When operations were about to stop, a special plane was flown in from CONUS with a load of the tie-downs and ratchets on board. It may sound ridiculous, but these items were that important to the re-supply effort.[35]

After the ground war was over, the battalion received an additional mission to haul relief supplies into Kuwait City for the beleaguered civilian population there. During this mission, the Battalion Chaplain, David Long, came across an orphanage at a school site not far from a delivery point for the relief supplies the convoys hauled. As in all wars, U.S. soldiers have big hearts, and the 419th began a "sponsorship" and collected clothing, toys, and food for the children in the orphanage who were in the care of a priest. The unit's families back in CONUS were quite supportive, and CPT Carroll, the Battalion S-4 then, believed that two or three truckloads of donated items were delivered to the orphanage.[36]

The 3/2nd Air Defense Battalion Task Force[37]

In order to provide additional personnel for the 7th Group, the 3rd Battalion, 2nd Air Defense Artillery Regiment, an Active Component unit from Fort Lewis, Washington, was deployed to Saudi Arabia without its Chapparal air defense weapons. The unit was alerted on 17 January 1991 and informed that its mission would be to provide 400 Heavy Equipment Mobility Medium Truck (HEMMT) operators. This was a challenging assignment because no one in the battalion had ever driven a HEMMT. The battalion had 400 personnel assigned and was augmented by individuals from other Fort Lewis units to bring it to a strength of 580 personnel for deployment. The entire 73rd Engineer Company with another 140 personnel was attached to form the task force. On 20 January 1991 a mobile training team arrived from the Transportation School to provide four days of driver training to the battalion's personnel. On 25 January 1991, the battalion deployed from Fort Lewis, Washington, with seven administrative vehicles, two pallets of unit equipment, and personal weapons and gear.

Upon arrival in Dhahran 22 hours later, the battalion task force was assigned to the 7th Transportation Group for duty at the port of Dammam. It also received 50 IRR personnel to bring it to a strength of about 730 personnel. While waiting for its anticipated HEMMTs to arrive, the unit was assigned to support terminal operations at Dammam. Battery A (equipped with eight Bradley Fighting Vehicles) was assigned to augment port security, and Battery B was assigned to assist in unloading ships.

On 2 February 1991, the long awaited vehicles arrived. They consisted of 200 Czechoslovakian TATRA trucks that had once been used by the East German Army and had now been donated by the unified German Government to assist the Coalition cause. The TATRA is a 10 ton truck designed for cargo hauling or trailer transport. The trucks were in poor condition upon arrival, and 60 vehicles were so bad that they were of use only as a source of parts for the remaining 140 trucks. There was no maintenance support, and all of the manuals were in German. To get the TATRAs in shape, all maintenance personnel were consolidated into a battalion shop, and the mechanics went to work and taught themselves how to get the trucks running and keep them running.

The battalion was told to get as many vehicles on the road as soon as possible to haul ammunition to forward logistical bases. As the TATRAs became operational, they were divided up between Battery C and the 73rd Engineer Company for driver training to familiarize the operators with the vehicles. On 5 February 1991, the first transportation mission was performed, hauling 2,000 pound bombs to Kind Fahd International Airport for the Air Force. The missions continued. As the mechanics and drivers gained experience with the TATRAs the operational readiness rate went up and the accident rate went down. Over 100 of the original 200 trucks were made operational, and the battalion hauled bombs, MLRS missiles, artillery shells, and propellant charges. Missions were driven as far as Log Base Echo, a thousand miles, three-day round trip from Dammam. During the ground war, the battalion delivered ammunition to the Marines during their assault.

The record of the battalion on its impromptu mission was excellent. Although there were accidents, there were no deaths or serious injuries among the drivers. The reorganized and retrained air defenders and engineers had driven over a half million miles, including 1,000 loads of ammunition to combat forces in contact with the enemy, off-loaded 27 ships, staged 10,000 pieces of military equipment, and put in 53,000 man-hours of effort securing the Port of Dammam. This effort demonstrated the flexibility and dedication of the troops of the 3/2nd Task Force. It also demonstrated the inherent capacity of the Army to respond to unforeseen events.

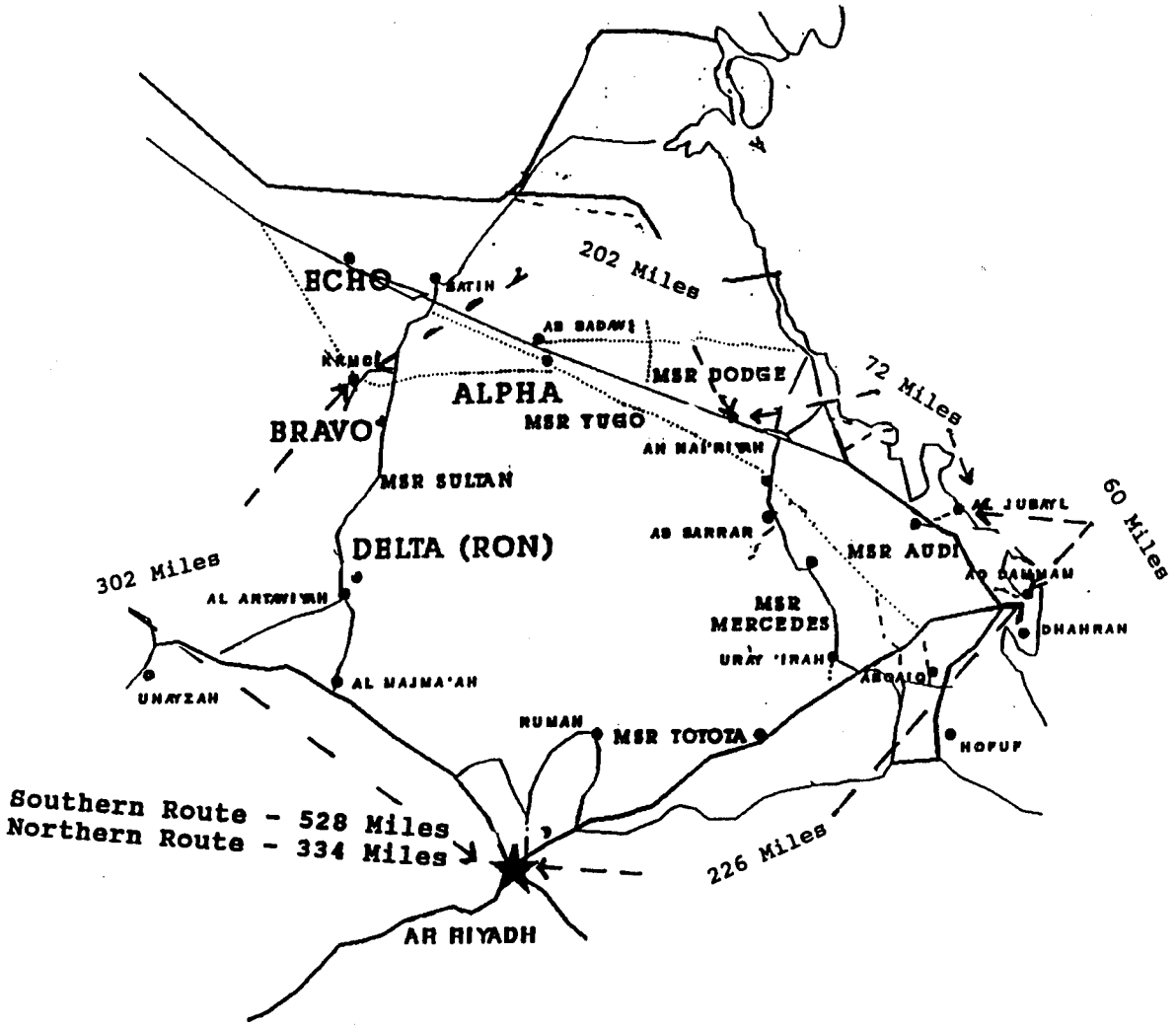
7th Group Operations

The 7th Transportation Group's specialty for which it was staffed and trained was terminal operations, but the mission called for the organization to enter into extensive highway operations as well. As the senior transportation headquarters in the entire theater for several months, it had to supervise everything--clear the ports by hauling cargo to inland supply points, direct incoming passengers to their next stop, and line-haul cargo to the supply points and logistics bases being established to support the offensive maneuver plan.

The 7th Group established the basic highway transportation system that was used throughout the war. There were two elements to it: the Main Supply Routes (MSRs) and the various support activities linked by the MSRs. The MSRs were established based on the existing road network, and the support activities were tied to the MSRs. Figure 14 shows the MSRs for Operations DESERT SHIELD and DESERT STORM, including those established for the ground attack into Kuwait and Iraq. The theater MSRs were named by the 318th Movement Control Agency. In Saudi Arabia, the MSRs were named for automobiles. In Kuwait they were named after USAR Centers in the 77th ARCOM area, the major command to which the 318th belonged. There were also MSRs in the two corps areas. In VII Corps they were named after colors; in XVIII Airborne Corps they were named after states. The most important and heavily used MSR was DODGE, linking Dhahran (and Dammam) with Jubayl, and extending Northwest to Hafr Al Batin, Rafha, and beyond along the trace of the existing TAPLINE road. During the buildup for the ground offensive, MSR Dodge was full of round-the-clock bumper-to-bumper traffic. The second most important MSR was SULTAN running north from Riyadh to KKMC and MSR Dodge.

Figure 14.

Main Supply Routes and Distances to Key Points



Several support activities were sited along the MSRs. The basic logistical support element was a logistical base, or log base, with support units to receive, store, and distribute supplies and services to using units. Log bases were the destinations for most of the transportation truck companies operating convoys from the ports loaded with food, ammunition,

and other supplies. Other convoys proceeded directly to the support areas of the divisions and other elements of the corps.

Trailer Transfer Points (TTPs) were established to provide locations at which the truck companies of different motor transport battalions dropped loaded trailers, picked up empty trailers, and went back for another load.

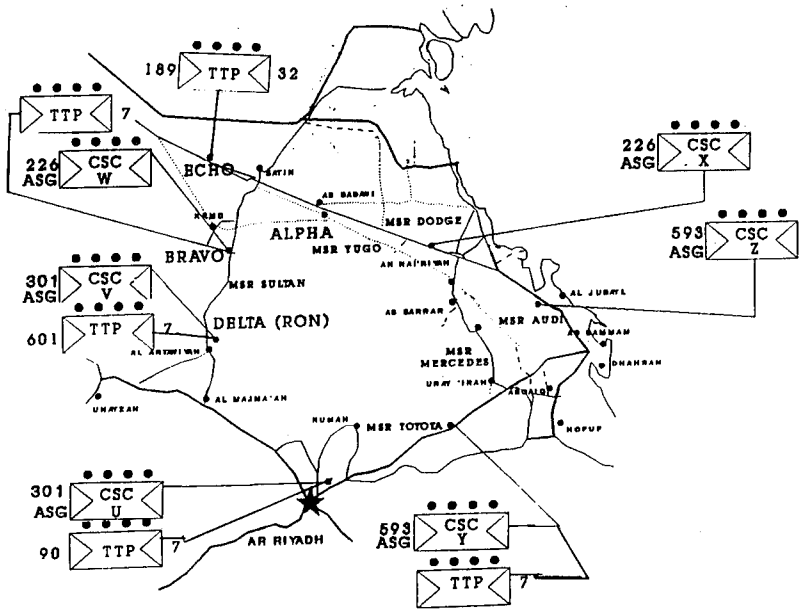
Convoy Consolidation Points (CCPs) were established by the motor transport operators to provide predesignated locations to which trucks could report after accomplishing their missions and from which new convoys could be formed to move back to points of origin at the ports and logbases.

Convoy Support Centers (CSCs) were a new kind of support activity invented by Colonel Whaley for this operation. As General Pagonis puts it, "These centers resembled huge truck stops in the desert, and like all truck stops, operated 24 hours a day, providing fuel, latrines, food, sleeping tents, and limited vehicle repair facilities. The convoy support centers quickly became welcome oases for overworked and exhausted long-haul drivers."[38]

Figure 15 shows the log bases, TTPs and CSCs established along the MSRs for the operation.

Figure 15.

Convoy Support Activities on the MSRs



The 7th Transportation Group had arrived, taken charge, established the ports, and started moving the units and cargo inland to the log bases. But the operation was expanding rapidly and it was necessary to consider how to manage the transportation effort that was an essential part of the ARCENT mission to build a support structure for combat operations.

Transportation Command and Control

Command and control of the transportation units at EAC in Operation DESERT STORM was a function of expediency and personality. Doctrinally, the command and control of transportation units at EAC should have been the responsibility of a theater transportation command reporting directly to the theater army command and co-equal with the theater support command. Instead, the theater army movement control agency and two transportation group headquarters at EAC reported to the 22nd Support Command (SUPCOM) and operated under the close supervision of the Deputy Commanding General of the 22nd SUPCOM for Transportation--Colonel David A Whaley.

The 143rd Transportation Command

The 143rd Transportation Command, USAR, Orlando, Florida, had trained for 10 years to support Third Army on a contingency operation in Southwest Asia, but it was never called. As in the case of some other Army Reserve functional commands, the Army elected to use instead an impromptu command organization created piecemeal in the theater.[39]

Third US Army was formed in 1982 to be the Army Component in support of the Central Command in planning for possible military operations in Southwest Asia. That same year, the 143rd Transportation Brigade was designated as the primary transportation planning headquarters for Third Army. Prior to that time, the 143rd had been a transportation brigade assigned to support XVIII Airborne Corps as part of the Rapid Deployment Force. In 1985, the unit was upgraded to a transportation command and reaffirmed in its role as the transportation planner and operator for Third Army.

The commander of the 143rd Transportation Command on 2 August 1990 was Major General James T. Craig, an experienced transporter who had spent 17 years in the 143rd. He had been the ACofS, Security, Plans, and Operations, the ACofS, Transportation, Commander of the 464th Chemical Group, and then the Chief of Staff from 1979 to 1983. General Craig served as the brigade commander for four years, and finally as the TRANSCOM commander as a major general for four years. During his tenure in the 143rd, General Craig did his utmost

to support Third Army by furnishing personnel to augment the Third Army G4 Section and accomplishing numerous assignments for the G4. Conversion to a TRANSCOM meant that more officers and more full-time AGR personnel would be available to plan for wartime and manage peacetime requirements. During this period before the Gulf War, the 143rd participated in numerous Third Army exercises, including INTERNAL LOOK, that rehearsed the new CENTCOM plan for war with Iraq in July 1990. The 143rd had 110 transportation units in its CAPSTONE (wartime) trace with an aggregate strength of about 10,000 soldiers. Its major subordinate commands were the 7th Terminal Group, the 32nd Composite Group, and the 375th Motor Transport Group, a USAR unit from Mobile, Alabama.[40]

During its pre-war preparation, the 143rd had contributed to substantial improvements in transportation doctrine and organization, including the concept of the composite group. The prevailing thought at that time was that a terminal group headquarters would operate all of the ports in the theater, and motor transport groups would operate the truck companies that would clear the ports, move the passengers and cargo, and stock the depots. The 143rd perceived that it might be more useful to divide the theater in a different way, particularly if the available ports were not close together, and so the idea of a composite group headquarters that would be capable of operating both terminal units and truck companies was suggested. This would not be a trivial change, for terminal groups lacked officers trained in highway operations, while motor transport groups lacked officers trained in terminal operations. During the War with Iraq, the 7th Terminal Group had to oversee highway operations and became a de facto composite group by augmenting its staff with personnel experienced in motor transport operations. The 32nd Group had converted from a Terminal Group to a Composite Group configuration in 1989. Taking this lesson to heart, the Army decided after the war that all transportation groups would be composite.

When the new CENTCOM commander, General Schwartzkopf, early in 1990 changed the command's planning emphasis from War with Iran to War with Iraq, the 143rd TRANSCOM started work on the transportation plan to support the new Operations Plan 1002. Studies were made on ports and roads in Saudi Arabia, and a revised list of units to be used was compiled. Based on previous work, the headquarters had much information to use in supporting the new plan, and it maintained constant liaison with the Third Army G4 Section. In fact, there was every reason to believe that based on long and harmonious association and readiness to provide transportation command and control, the 143rd Transportation Command would be called up to be the senior transportation headquarters in the theater.

The Assistant Chief of Staff for Transportation

That was not to be the case. Instead, the senior Army officers on the ground initially relied on improvised arrangements and provisional headquarters to plan, organize, and carry out transportation in the theater. This was due partly to the inability of the Army to call up the designated Reserve headquarters during the critical first month of August 1990, but it was also due to the personalities involved, particularly that of the chief logistician, General Pagonis. According to the Army's official history,

> "Pagonis relied heavily on trusted agents--soldiers whom he personally knew and in whom he had total confidence. He used his team as an extension of himself. Although they were not necessarily high-ranking--many were sergeants--each was skilled in a particular logistical function and was empowered to act alone in order to cut through red tape and fix a problem on the spot. One of the earliest members of Pagonis' team, Lieutenant Colonel Mike Velten, formed an ad hoc transportation organization to move troops using Saudi contract buses. This infant organization , consisting of a captain from the 7th Transportation Group and about a dozen soldiers, set up shop in a tent, contracted for buses and materials-handling equipment, and began moving soldiers and their baggage through the airport at Dhahran."[41]

As related earlier, Pagonis was delighted with the early arrival of Colonel David Whaley, and this officer, then the commander of the 7th Transportation Group, became the trusted agent for the theater transportation system. Not only was Colonel Whaley an excellent transporter, but he had already been selected for promotion to brigadier general, and on 1 November 1990 Colonel Whaley relinquished command of the 7th Group to become Assistant Chief of Staff Transportation (ACSTRANS) of the 22nd SUPCOM. This move confirmed Whaley's position as the chief transporter of the theater--a fact that weighed heavily against immediate deployment of the 143rd TRANSCOM when that became possible after September 1990. By the time the 143rd could have deployed, Colonel Whaley was firmly in charge.

An attempt was made by Department of the Army and Forces Command to obtain theater approval for the deployment of the 143rd TRANSCOM to the theater to coincide with the substantial buildup of support units for the forthcoming ground campaign taking place in December 1990 and January 1991. Staff officers at FORSCOM had consistently favored deploying the 143rd TRANSCOM to provide command and control for the two group headquarters. LTG Jimmy Ross, the DCSLOG of the Army, deplored what he termed the "failure to put the doctrinally correct transportation C2 element into the operation" and recommended that the 143rd be deployed prior to 15 January 1991.[42] However, these efforts were to fail. General Pagonis and his boss, General Yeosock, were happy with the improvised

arrangements, and General Pagonis in particular did not want to have to compete with another two-star headquarters that would, doctrinally at least, have been co-equal with his own 22nd Support Command. (General Pagonis was promoted to three-star rank on 7 February 1991.) Despite some talk about using the 143rd for the redeployment phase or taking some of the experienced transporters from the 143rd to help fill out the 22nd SUPCOM staff, the transportation command was not deployed. Several officers from the 143rd were reassigned to fill out the 32nd Group headquarters when that unit deployed in December 1990, but the experience, skill, and dedication of most of the officers and enlisted personnel of the 143rd Transportation Command were wasted.[43]

Colonel (P) Whaley remained the top transporter in ARCENT for the entire war. As a promotable colonel he had the edge on other colonels, and he had the confidence of both General Pagonis and General Yeosock.[44] His official positions were as the ACSTRANS, a staff officer in Headquarters, 22nd SUPCOM, and from mid-November 1990 as Deputy Commanding General of the 22nd SUPCOM for Transportation--a position which gave him some command authority as well as staff authority.[45] Colonel Whaley graduated from the Transportation Officer Candidate School in 1966 and commanded transportation units at all levels until he was assigned as commander of the 7th Group. He also had earned both Bachelors and Masters degrees, served a tour with industry, and held key staff positions on the Joint Staff and the Army Staff.[46] He was well suited for the role into which fortune thrust him.

Despite some of the post-war organizational charts showing a provisional transportation command, there never was such an organization. Colonel Whaley's personal command consisted of his sergeant major and, for a short period of time an ad hoc planning group of five officers convened to plan the movement of the two corps into attack positions. He characterizes his duties as being the G3 operations officer for transportation, a duty for which he had the assistance of 25 officers assigned to the ACSTRANS.[47] The responsibility for the other staff functions--personnel, intelligence, and logistics--for the transportation groups and battalions was carried out by the 22nd SUPCOM staff.

One of Colonel Whaley's greatest contributions to the war effort was his close relationship with Major Ali M. Al Shoaibi, the Director of the Jeddah Branch for Air Defense Projects, and the King's personal representative for transportation matters.[48] This close relationship bore fruit when it became necessary to press almost every available truck in Saudi Arabia into service to support the war effort.

The 22nd SUPCOM staff was created by taking individual officers and NCOs from units arriving in the theater. Since the 7th Transportation Group was one of the first large logistical headquarters to arrive, it furnished the second increment of staffing for the 22nd SUPCOM--the first increment being the three officers who had arrived with General Pagonis.[49] Not only was

the staff of the group headquarters used to form the support command headquarters, but several ARNG and USAR transportation detachments were broken up upon arrival in the theater so that the individual officers could be assigned to fill staff slots that were urgently needed to command and control the evolving and expanding logistical and transportation systems. As a result, the SUPCOM staff initially had a high proportion of transportation officers, but later as General Pagonis' 20 hand-picked logisticians and other officers of other branches arrived, most of the transporters filtered back to their original units.

In retrospect, General Whaley agrees that it would have been good to have had a transportation command in the theater. The ARCENT (Third Army) staff was very small initially and found it hard to deal with the "explosive development of a theater."[50] As commander of the 7th Transportation Group, Whaley had worked in the CAPSTONE downtrace of the 143rd TRANSCOM, and he had a good relationship before the war with General Craig and the 143rd staff. Whaley believes the reason that the 143rd was not utilized was because General Yeosock tried to maintain a high ratio of combat to support forces in the face of a constantly changing situation and mission. By this logic, there was no opportunity to deploy the 143rd in the early days and no perceived need later on.[51]

The 417th Contract Supervision Detachment

One unit that was broken up to form the staff was the 417th Contract Supervision Detachment, USAR, Baltimore, MD. The experience of this unit illustrates the improvised way in which the command and control arrangements for transportation evolved. The 417th, under the command of Lieutenant Colonel Jonathan H. Kent, was deployed to Saudi Arabia on 1 October 1990, expecting to perform the unit's mission of operating a small port using contractors to perform the work of unloading and loading the ships.[52] This made sense, for in those early days, there was a scramble to get units on the ground to receive the large amounts of equipment and cargo moving inexorably toward Saudi Arabia on ships. Most of the detachment's personnel were trained to supervise contractors providing stevedores and other labor to do the work, and one officer was authorized to let the contracts. At this time, it was thought that some of the smaller ports in Saudi Arabia might be needed to replace or supplement Dammam.

Upon arrival in Dammam on 8 October 1990, however, the unit was not used to carry out its peacetime mission and was put to work in other ways.[53] The 7th Group had arrived, and the port of Dammam was handling the inflow of cargo, so there was no immediate need to open a small port. The personnel of the detachment were in great demand for their individual skills, and it looked as if the unit would be completely broken up and the members used as individual fillers. However, Colonel Whaley, who was moving up in a few days to become the Assistant Chief of Staff for Transportation (ACSTRANS) for the 22nd Support Command, asked

Lieutenant Colonel Kent to become the operations officer in his new office. Colonel Kent agreed to join Colonel Whaley, provided he could bring along some of his people and the 417th would be reassembled if there was a need in the future to open a small port. Colonel Whaley agreed, and Colonel Kent arranged for the junior enlisted personnel to get jobs in port operations at Dammam and took most of his officers and the senior NCOs with him to form the operations section for ACSTRANS. They were joined at ACSTRANS by members of a movement control team from the South Dakota ARNG, and by an assortment of IMAs and other individuals who were brought together to form what would turn out to be a provisional transportation command.

The contracting officer, Captain Mark Zuffa, was put to work in the 22nd SUPCOM Contracting Office, and worked there for the duration of the campaign. Because of the extensive reliance placed on contracting for host nation support, bonded contracting officers who were authorized to let contracts were in heavy demand, and Captain Zuffa had the authority to let large contracts.

After six weeks of hard work at the ACSTRANS, Lieutenant Colonel Kent and his operations staff were transferred to a new provisional organization, the Northern Logistical Operations Center (LOC), created specifically to coordinate the arrival of the VII Corps from Europe. The Northern LOC was designated as the single point of contact to coordinate movements with the commander of the 2nd COSCOM. After VII Corps was on the ground and capable of fending for itself, Lieutenant Colonel Kent and his operations staff moved to KKMC to establish a LOC there.

The operations team started the move to KKMC on 15 December and closed there on 2 January 1991, with Colonel Kent being the last to arrive from the former location. Colonel Kent became the G3 of the 22nd Support Command Forward Headquarters and remained in this position for the remainder of the operation. He and the detachment redeployed to the United States on 17 May 1991. During the move to KKMC, with the support of now General Whaley, Colonel Kent was able to reassemble most of his unit by bringing his unit NCOs forward to join the rest of the team. Colonel Kent thinks that the experience that he and his fellow contract specialists brought to the theater was highly useful, and that even though the units did not perform the missions for which they had trained, the members did their jobs every bit as well as the Active Component soldiers with whom they served.[54]

Theater Movement Control

There was recognition at the outset for a movement control organization in the theater, and movement control teams (MCT) were among the first of the support units deployed to the theater. The mature theater movement control structure is shown in Figure 16.

Figure 16.

Theater Army Movement Control Organization

22nd SUPCOM

318th Movement Control Agency, USAR
COL Peter C. Langenus (Dhahran Air Base)

93rd Movement Control Battalion, Provisional
LTC Bruce R. Leferriere (Port of Dammam)

49th Movement Control Battalion, AC
LTC Michael Topp (KKMC)

XVIII Airborne Corps, 1st COSCOM

330th Movement Control Battalion, AC, LTC John Race

VII Corps, 2nd COSCOM

229th Movement Control Battalion, AC, LTC John Pittman

The 318th Movement Control Agency (MCA)

The top level of the theater movement control organization was established when, on 10 October 1990, the 318th Movement Control Agency, USAR, Jamaica, New York, arrived in Saudi Arabia under the command of Colonel Peter C. Langenus. Its mission: plan and control the work of all transportation modes in the theater. The 318th was one of the first RC units to be called to active duty, and it arrived in theater about two months after the first US Army

troops had arrived. When it arrived, the XVIII Corps was essentially on the ground, and the build-up for a defensive position was well underway. The 318th MCA faced a controversial mission from the start, due to its inherently complex role and the fact that such a huge movement control requirement had never been undertaken in combat in such a harsh and undeveloped environment.[55] The 318th, throughout Operation DESERT STORM, dealt with the natural tensions between movement control people and transportation mode operators on a daily basis.

Colonel Peter C. Langenus

Colonel Langenus had assumed command of the 318th MCA in June 1990, just three months before the unit arrived in Southwest Asia. Colonel Langenus was a lawyer who had graduated from the University of Notre Dame, received his commission through the ROTC program there, and after attending law school at New York University, served in Vietnam as an infantry company commander. He was active in the Army Reserve and served as Assistant Commandant of the 1150th Army Reserve Forces School and as a resource management staff officer at Headquarters, 77th Army Reserve Command. In civil life, he is a partner in a New York law firm. In April 1986, he was promoted to colonel and assigned as the Commander, 364th Support Group.[56] In June 1990, Colonel Langenus was assigned to command the 318th MCA. Although not a transportation specialist, his four years in command of the support group had given him a fundamental grounding in logistics which served him well in the theater-wide movement control mission.

The position of commander of a theater movement control agency calls for a brigadier general. Ironically, the view has been expressed that in these early days, the 318th managed to get into the theater because the commander was not a general officer.[57] The senior transporters in the theater worked out a relationship which they maintained throughout the Gulf War and which expedited mission accomplishment considering the nature of the conflict. Colonel Whaley was General Pagonis' deputy for transportation matters and was the senior transportation manager and coordinator in the theater because of his position and his promotable status.[58]

Upon arrival in theater, it is certain that the expectations of Colonel Langenus were not met fully, for he and the unit expected to operate from Riyadh directly under the ARCENT commander, General Yeosock. They believed that the theater movement control agency should not be subordinate to the support command because this creates a conflict of interest. The support command is a major claimant for transportation assets (for which there are many other customers), and tasking of transportation should be done apart from any of the major claimants. The 318th also believed that the two movement control battalions in the corps should have

reported directly to their respective corps G3s instead of to the COSCOM headquarters.[59]

The unit had many senior personnel authorized in its TOE, with four colonels, five lieutenant colonels, and 11 majors, but Colonel Langenus points out that the 318th was a "cerebral unit with a thinking person's mission." As well, elements of the headquarters operated from Dhahran, Riyadh, KKMC, and Kuwait City, sometimes simultaneously, so the rank and experience helped with wide-ranging and split functioning[60]

The 32nd Group represents the transportation mode operator's viewpoint of movement control. The Group operations officer, Major Jack Stultz, thought that doctrine did not work primarily because it was hard for the movement control agency to enforce the tasking sent to the operators. The 318th had provided representatives of the 49th, 229th, and 330th Movement Control Battalions at the 32nd Group headquarters. With these assets, MAJ Stultz would have liked to control movement in the 32nd operating area.[61] In planning and implementing the great move of the two corps, Colonel Langenus had encouraged direct coordination among the group and the corps headquarters. The 32nd Group's desire to control missions for themselves illustrates the natural tension between the mode operator and the MCA alluded to earlier.

In the aftermath of the war, there is almost universal belief among transportation people that the conflict between theater movement control and mode operators must be resolved. General Whaley, gives credit to the 318th, but says it arrived in theater too late to get control of the situation.[62] The 22nd SUPCOM after-action report suggests that more movement control assets were required for such a difficult mission. At page 4-15, FM 100-17, it is stated:

> "The 318th Transportation Agency (TAMCA)(Army Reserve, Jamaica, NY) managed all intratheater movements in the CENTCOM theater from October 1990 until its redeployment in June 1991. Never before had a single movement control unit managed the movement of a theater army, while at the same time controlling the movement of thousands of trucks, tracks, and trains to sustain a force of over a half-a-million personnel."

In summary, this was a very demanding mission that the 318th was given, and although there is some criticism of the movement control function, it is clear the command made an important contribution to the success of the war effort and cannot be faulted for a variety of factors beyond its control.

General Whaley faults the Active Army for not having provided adequate pre-war training for high level headquarters, such as the 318th. He points out that training for the 318th on pre-war exercises, such as BRIGHT STAR, involved receiving two ships and 2,000 troops, with a set script--hardly sufficient to train the unit on what was expected of the theater

movement control agency in a theater receiving hundreds of ships and several hundred thousand troops. Whaley also makes the more subtle point that the Reserve headquarters were trained to follow doctrine but not to be able to innovate situationally from a doctrinal base, as active headquarters could.[63] General Whaley believes the 318th did well given their experience level and the inherent problems of the huge mission the command was required to perform.

Lieutenant General Samuel N. Wakefield, Chief of Transportation during the war as a major general, concurs with General Whaley's view. General Wakefield visited the 318th while it was staging at its mobilization station of Fort Dix, New Jersey.[64] He thought that the 318th was a good group of people, but that they simply did not have enough training or equipment to do the job in Southwest Asia. For one thing, the unit's MTOE authorized no computers, and General Wakefield arranged for the 318th to receive $500,000 worth of computers to take to the theater. General Wakefield points out that it is difficult to train on theater movement control in peacetime, because synchronization of transportation requirements and capability on a large scale takes time to achieve. He recognizes that there were problems with movement control during Operation DESERT STORM but believes that any movement control agency that tried to do the job, including an AC unit, would have had the same problems experienced by the 318th.[65] In that regard, he notes that the MCA in Europe is stretched to the breaking point by the annual REFORGER exercises.

Operations of the 318th MCA

When the 318th arrived in theater, it was well aware that many of the other detachments had been broken up to staff the various provisional headquarters that were being formed at EAC, and Colonel Langenus was determined not to let that happen to the movement control agency. So the first thing that had to be done was to assure that the 318th would be intact and in charge. The 318th arrived at the moment when Colonel Whaley was moving up from the 7th Group to the 22nd SUPCOM staff, and both Whaley and General Pagonis supported the position that the 318th should remain intact.

At the time of the arrival of the 318th, there was an existing movement control organization in effect for XVIII Corps and also for the theater, under 7th Transportation Group. The 330th Movement Control Battalion[66] had arrived in August 1990 and was controlling the use of the transportation assets in the 1st COSCOM. The 93rd Movement Control Battalion had been formed to supervise several movement control teams (MCTs) that had arrived to manage the EAC mission. The 7th Transportation Group in effect was the theater movement control agency for the first two months of Operation DESERT STORM. The 7th Group had become comfortable in the role of doing both the tasking and moving and acquiesced grudgingly in the takeover by the 318th of the theater movement control function.[67]

The 318th MCA was charged with the following missions:

a. Assessing all transportation assets in the theater and matching the assets with the demand. (As Colonel Langenus points out, this would have required another miracle of the loaves and fishes, since there was never enough transportation capability to meet the demand.[68])

b. Tasking the operators of those assets by giving specific missions to commanders of transportation groups and battalions.

c. Controlling the schedule of when and where each truck, train, plane, or vessel should be and where it should go.

The personnel of the 318th worked hard during their eight month stay in Southwest Asia. Teams from the 318th found out what cargo was coming into the theater on ships and aircraft and notified other headquarters about what to expect. A Transportation Movement Control Center was set up with a large map upon which pins represented the highway convoys. Expected and actual locations of convoys were plotted every two hours, giving a visual understanding of what was happening.[69] The 93rd and 49th Movement Control Battalions established movement control teams (MCT) at points along the MSR and stationed highway regulating teams to note and report the condition and composition of convoys and other highway traffic.[70] Final destination reporting points were set up at log bases and other key locations to report closure of convoys and provide information on stockage levels attained for the various classes of supply. MCTs were set up to provide a network of reporting stations to inform the four movement control battalions and the 318th MCA the status of highway transportation in the theater. Operations were hampered by lack of computers and communications, and extraordinary measures had to be taken to obtain, by motor messenger, reports that were often out of date when they arrived at the 318th to be posted on the situation board.

The 318th took the initiative to place road signs along the MSRs in the theater. Saudi Arabia was a featureless area, and the local road signs were few and far between. Doctrinally, the Military Police post temporary signs, and the Engineers put up permanent signs, but because of other urgent tasks, this was not being done. The 318th had 490 metal signs made by a local contractor and posted them along the MSRs in October and November 1990 to provide permanent markings.[71] Although this was a small thing, it was a useful thing that otherwise might have fallen through the cracks.

In addition to its highway movement control functions, the 318th was involved in the joint use of transportation assets, port operations, the issue of accountability, and use of the existing railway system.

Coordination of Joint Transportation Assets

The 318th MCA operated at the theater level, working with the Air Force, Marine Corps, and the Coalition partners, as well as with ARCENT. They were the "honest broker" in dealing with users and providers of all modes of transportation.[72] They participated in the Joint Movements Center and the Joint Transportation Board established to coordinate the allocation of transportation assets among the Components and the Coalition forces.

The 318th MCA represented the 22nd SUPCOM and ARCENT on the Joint Transportation Board established under CENTCOM to allocate theater transportation resources among the Components. ARCENT was responsible for providing common user ground transportation to the Air Force and, to a limited extent, to the Marines. Army vessels also supported Marine and Air Force units in coastal shipping. The Air Force provided both strategic and tactical airlift for the Army.

The 318th also had responsibility for coordinating Army use of the intra-theater airlift system operated by the Air Force. This system provided daily scheduled flights to principal points and special flights upon request. The 318th MCA validated Army requests for intra-theater airlift, including the movement of 82nd Airborne Division personnel from Dhahran to Rafha and KKMC during the westward movement to attack positions. The 330th Movement Control Battalion requested the mission from the 318th, who coordinated with the Air Force and CENTCOM and obtained mission numbers. The 318th also kept track of Army passengers on the scheduled intra-theater airlift system.

Operations at the Ports

Port clearance was a major problem in the first phase of the operation--building up for the defense of Saudi Arabia. Ammunition in particular was piling up at the ports in sufficient quantities to pose a significant safety hazard. Ships were coming in in ever increasing numbers bearing large quantities of equipment and containers filled with supplies. Clearing the equipment was a matter of identifying the unit to which the equipment belonged and either having the equipment driven off by unit drivers or hauled by HET to a unit location. The other part of the job--moving the containers out of the port--was complicated by the fact that most of the containers were unmarked or mismarked so that the nature of the contents was unknown. This complicated the task of the movement control people, who needed to schedule loading and hauling of particular items to specific destinations. The solution adopted was to move the containers to inland depots or log bases, identify the contents by opening the containers, and then placing the containers in the proper portion of the log base. This procedure was not neat, but it did allow the ports to be cleared so that incoming vessels could be unloaded.

One of the first things the 318th did upon arrival in the theater was to establish a movement control team at the Port of Dammam. Major Larry Moloney, an experienced Transportation Corps officer, whose civil occupation is warehouse management was placed in charge of the MCT. The problem was that there were 3,000 containers at the port, more were coming in, and the existing three person management team from the Military Traffic Management Command (MTMC) was overwhelmed and working too hard.[73] Help was needed. Moreover, the MCT could not identify what was in the containers.

For three months, the MCT and the 24th Terminal Battalion were opening 300-400 containers daily at the port, but this did not suffice, and General Pagonis said, "clear the port."[74] This resulted in mass movement of containers from the port and the confrontation with the 321st MMC described below. Later, the documentation of the containers improved, and data on containers and contents allowed the process to proceed in a more orderly fashion. However, the situation was not solved fully until well into the redeployment phase in the Spring of 1991.[75]

In an effort to improve knowledge of incoming cargo, the 318th organized in November 1990 a Flag Carrier Committee to coordinate the operations of the various commercial shipping lines that were sending vessels to Saudi Arabia. The committee consisted of officers from the 318th and 7th Group and representatives of the Sealand Corporation, Lykks, Farrell, and APL firms. The committee met twice a week to discuss ways to improve operations at the ports. The commercial firms were valuable in finding local assets, including trucks and drivers, to be used in speeding up port clearance to permit unloading of the vessels. One accomplishment was to obtain manifests for incoming ships to help determine the priority and appropriate equipment for unloading.[76] About 400 additional trucks were made available through the good offices of the Flag Carrier Committee.

Another contribution of the 318th was the instigation of a marine LOC running along the Saudi coast initially and then up toward Kuwait using Army watercraft to carry equipment and cargo, and saving precious HET and truck assets. This was the brainchild of Major Moloney and Major Bob O'Neill. There was considerable difficulty in moving containers into Jubayl by road, so Moloney tasked the LSVs to move containers along the coast. Each LSV could carry twenty-two 40' containers, and the coastal LOC worked well. Ultimately, using the Army watercraft saved thousands of truck miles by hauling heavy equipment and cargo between Dammam and Jubayl and back, and less frequently to other Persian Gulf ports.[77]

Port Clearance versus Accountability

The port clearance situation was complicated by the desire of the logisticians to establish accountability for the supplies--basically knowing what items were located where and in which container. Accountability was necessary to be able to fill requisitions from units and send the right supplies to the right units. Responsibility for establishing theater-wide accountability for supplies rested with the 321st Materiel Management Center (MMC), USAR, Baton Rouge, Louisiana, under the command of Colonel Victor Hill. The 321st arrived in theater a few days after the 318th. The 321st naturally set out to fulfill its responsibility for assuring that the using units received the right supplies and support in a timely manner. However, the thrust to gain accountability by opening and checking the contents of containers slowed down the movement of containers from the ports and conflicted with the desire of the transporters to clear the ports to make room for the flood of cargo and equipment still underway in ships en route.[78]

Ideally, the 318th and the 321st should have worked together intimately to develop a theater distribution plan and cause it to be carried out. The 318th would move the supplies in accordance with the instructions and priorities established by the 321st. This did not happen because there were other problems that precluded a close, cooperative working relationship.

The period of tension between the two opposing imperatives, property accountability versus movement of assets, lasted from mid-October until mid-December 1990, when a workable solution was achieved that satisfied both parties. In the interim, both sides pressed their cases, and both sides thought they had the support of General Pagonis. Acting with Whaley's support and in accordance with General Pagonis' instructions, the 318th and the 7th Group moved unopened containers out of the port to log bases, where they were opened, contents checked, and containers moved to the appropriate location for distribution. At the same time, the 321st had teams at the ports opening containers and establishing their contents--also in accordance with General Pagonis' instructions to establish accountability.[79] This conflict culminated when, in order to get the attention of the transporters, Colonel Hill initiated an administrative investigation to determine the accountability of the containers while still clearing the cargo from the port as ordered by General Pagonis.[80] Ultimately, time and progress in both port clearance and accountability eased the problem, but the ill effects lingered through the entire operation.[81]

Actually, the real root of the problem was the fault neither of the 318th nor the 321st. The basic problem was that large numbers of containers arrived at the ports either unmarked or improperly marked. This meant that the containers would have to be checked to find out what was inside. Also, many of the supplies shipped to the theater on the "push" system had been addressed simply to the XVIII Airborne Corps during the period that this was the only major organization in the theater, and this caused problems for the EAC units that were supposed to take charge of the supplies for distribution.[82]

Finally, the 318th MCA and the 321st MMC simply arrived in theater too late to gain control of a distribution system already in disarray. To establish a theater logistical system properly, a total distribution plan has to be set up at the outset. The MMC needs to establish asset balance accounts, so that the materiel managers can act on requisitions and provide instructions to the movement control personnel to deliver specific supplies to specific units at specific locations. This was not done early enough in Southwest Asia because the units responsible for doing this did not deploy until large numbers of supplies had already arrived. Logisticians believe that the theater MMC and MCA should be established within the first 4-5 days of a theater deployment, using at first small teams that can be augmented as the workload increases.[83]

Railway Operations

One of the major initiatives of the 318th MCA was to make use of the Saudi Arabian railway system to move large quantities of supplies and supplement the highway line-haul operation.[84] The Saudi Arabian railway ran from Dammam to Dhahran and then to Riyadh. One line was a high-speed direct line, and the other linked some intermediate stops, including the large air base at Al Kharj. Because the focus of attention of Army transportation planners was on the Tapline Road in the North, no notice was paid to these rail lines in the early movement of passengers or cargo.

Upon arrival in country, the 318th had reviewed all on-going transportation operations and had taken note that 500 tons of ammunition were being hauled daily by truck from Dammam to the air base at Al Kharj, about 300 miles to the west. The trip to Al Kharj required inter-provincial clearances and Saudi military police escorts. Arranging the trips was a difficult process as well as a drain on truck assets that were needed elsewhere. It occurred to Major Joseph A. Burro and Lieutenant Colonel Nickolas Christopher--both long-time railroad buffs--that the railway could be useful in moving this ammunition.

On 15 October 1990, representatives of the 318th made contact with the Saudi Railway Organization (SRO) in Dammam to explore the possibility of using the railway for hauling cargo in support of the war. The Saudi authorities were enthusiastic and promised to make available whatever railroad resources were needed. The only limitation was that the trains could not operate on Thursday or Friday--the Saudi Sabbath.

On 9 December 1990, the first 50 car ammunition train was on its way to Al Kharj, and 36 hours later it was off-loaded at Al Kharj. That one train saved the use of 135 medium trucks for 3 days. This first train was the result of a lot of planning, negotiation, and arranging with the Saudis plus a lot of effort to overcome skepticism within the Army.[85] These ammunition

trains to the Air Force at Al Kharj continued throughout the war, saving many trucks for other missions.

As the plan for the ground campaign evolved, it became apparent that there were not enough trucks in Saudi Arabia to move all of the supplies over the distances contemplated in the great move of the two corps to the West. It was necessary to use the rail system to meet some of the demand. The 318th expanded its talks with the Saudi Railway Organization as to the feasibility of hauling freight all the way to Riyadh, to be off loaded there and then loaded on trucks for movement north to the attack positions. The contracting arrangements were made, and on 17 December 1990, the first train left for Riyadh with 74 gondola cars, each carrying a forty foot container. From 17 December 1990 to 17 January 1991 a total of 13 special trains traveled from Dammam to Riyadh, carrying over 14,000 tons of supplies, including 22 complete hospitals.

After the start of the air war, the pace picked up, and two and sometimes three Army trains traveled to Riyadh each day to be met there by trucks to form convoys to move the cargo north toward Iraq. The urgency of the situation was such that on 24 and 25 January 1991, the Saudi authorities allowed trains to run on the Sabbath. On those two days, over 180 containers of medical supplies were moved. Overall, an additional 58 trains ran from Dammam to Riyahd during the air and ground war.

EAC Movement Control Organization

As shown in Figure 16, the 318th MCA organized its movement control detachments into two battalions, the 93rd and the 49th. Each battalion took a different approach to the problem. The exact organization of these battalions is shown in Appendix B.

The 93rd Movement Control Battalion was a provisional unit formed in the theater by combining other movement control teams. The unit was activated on 8 September 1990, and Lieutenant Colonel Bruce R. Leferriere assumed command of the battalion that day and started to assemble his staff and establish MCTs.[86] Ultimately, the battalion had an aggregate strength of 275 and included 25 detachments of various kinds and components (6 AC, 9 ARNG, and 10 USAR). The 93rd Movement Control Battalion operated MCTs at Dammam, Dhahran, Abu Dhabi, Jubayl, Riyadh, and Jeddah. It had teams at the airfields at Dhahran, Riyadh, and KKMC. It processed over 22,000 movement requests, cleared over 6,000 convoys, and processed for movement over one million tons of munitions, 100,000 pieces of equipment, and 260,000 passengers.[87] Except for the commander and two other officers, the battalion staff and headquarters company were staffed by taking people from detachments as individuals. Other team members filled a variety of jobs, including working in the ACSTRANS section at 22nd

SUPCOM and as clerks for General Pagonis and Colonel Whaley. Battalion personnel were assigned to the various locations without regard for the integrity of the original detachments, and there were complaints that the battalion commander removed court martial authority from all detachment commanders and took them out of the performance rating scheme.[88]

The experience of the 200th TC Detachment, Movement Control, USAR, Baltimore, Maryland, was typical of that of the detachments of the 93rd Battalion. The 200th MCT arrived in Dhahran on 13 September 1990--one of the first Reserve units to arrive in the theater. Although the unit was in the CAPSTONE trace of the 330th Movement Control Battalion (XVIII Corps), it was assigned to the newly formed 93rd Movement Control Battalion at the Port of Dammam. Three officers and one of the enlisted personnel were assigned to help form the battalion staff, and Major John M. Davidson, the Detachment Commander, was used initially to establish an MCT in Jubayl and then as the Container and Railway Operations Officer at Dammam. The other two officers and 4 enlisted personnel, under Captain Tony Datcher, established an MCT at Dhahran Air Base, engaged primarily in obtaining bus transportation for personnel of incoming units. Although it was split up and did not perform its mission as a unit, the individuals did a good job and earned two Bronze Star Medals, several other awards, and the esteem of their colleagues.[89]

A sister unit of the 200th from Baltimore, the 202nd TC Detachment, Cargo Documentation, USAR, was treated a bit better. The 202nd arrived in theater at the same time as the 200th with eight enlisted personnel. The 202nd was assigned from September to December 1990 to the 24th Terminal Battalion at Dammam, where it performed guard duty and other housekeeping chores for several weeks before being used for a short time to perform its function of documenting incoming cargo. In January 1991, the 202nd was reassigned to perform a movement control mission at Log Base Bravo near KKMC as part of the 49th Movement Control Battalion.[90]

In January 1991, the 49th Movement Control Battalion arrived and was also assigned to the 318th Movement Control Agency. The 49th Battalion was assigned to work the forward sector of the MSR network, operating out of KKMC, and providing support to the 32nd Transportation Group predominantly.

Evaluation of Theater Movement Control

While it did not work flawlessly, the theater movement control system worked well enough. The movement control units and troops involved did a good job given the conditions of the time and place and the difficulty of their mission. There was a general sigh of relief when the ground war ended after only five days with remarkably low casualties. Members of

the 318th made major contributions to the theater transportation system and tried hard to do their job on highway movement. The major criticism of movement control is that there was a lack of timely information about what was moving where and firm guidance on what was to be done. This is true, but the reasons have to do more with poor communications, lack of cooperation by some using units, and late arrival in the theater.

Communications was a major problem for both the movement control system and the transportation mode operators. Messages were transmitted and received using a patchwork network of cellular telephones, land lines, and HF and FM radios. In desperation, it was necessary to resort to vehicle messengers. Closure reports from Log Bases Alpha and Echo, for example, were submitted daily by that means. The communications problem was never solved and a lack of reliable theater communications contributed significantly to movement control problems in the theater and hindered management of them.

There was significant lack of cooperation by both using units and some mode operators. In order to make best use of the limited highway network, all vehicle movement over the MSRs was supposed to be accomplished in convoys that had been approved for particular start times, routes, and destinations. Some units, such as the 475th Quartermaster POL Group, were authorized to move their truck-tankers in small groups of three to five vehicles by infiltration, but the unit moves and the line-haul by the semi-trailers of the 7th and 32nd Groups were all supposed to move in convoys under control of the 318th TAMCA and the four movement control battalions. In some instances, due to perceived urgency and lack of guidance, convoys were formed and initiated by the mode operators without tasking from the movement control system. These unauthorized convoys made it more difficult for the 318th and its MCTs to know what was going on and make rational resource allocation decisions.

While the transportation truck units supported the movement control system at least in concept, other units did not always see the need for restrictions on their own freedom of movement. There were cases reported of unapproved convoys and even of officers "high-jacking" entire groups of empty trucks from the highway to support an unauthorized movement. In one instance, many trucks were missing, and General Whaley predicted to Generals Yeosock and Pagonis that the identity of the culprit would be revealed when some major organization would make an unauthorized move in a few days. Sure enough, in five days, there was an unauthorized move, followed by certain retribution from the ARCENT commander. In another instance, it was noted that too few trailers were returning empty from runs to the supply points of one of the corps. Colonel Whaley protested to the corps staff, but the response was that the corps would never do such a thing. Colonel Whaley sent a major with a video camera to the corps supply points and obtained evidence of 500 or more 22nd SUPCOM trailers sitting there fully loaded. When presented with the evidence, and the ultimatum that there would be no new supplies hauled in until the trailers were released, the corps relented and thereafter were good

boys.[91]

The 32nd Group reports that when convoys were placed in support of using units, those units often perceived that they were granted "ownership of the assets." The using units often subdivided the convoy's trucks among subordinate units, causing the truck companies to lose control, and making it difficult to reassemble convoys for additional movement missions. The using units also tended to keep trucks for their own personal use, even using the drivers for additional duties within the units. This tendency degraded the ability of the transportation truck companies to perform the line haul work for which they were provided.[92]

The experience of Operations DESERT SHIELD and DESERT STORM indicates problems in movement control doctrine and execution that need to be considered for future operations. Curiously, few Transportation Corps officers fault their own doctrine of two parallel chains of command--one for movement control and the other for operations. Transportation Corps officers universally believe the doctrine was and is correct, but that it was not followed in the War with Iraq.

The 32nd Transportation Group (Composite)

The advance party of Headquarters, 32nd Transportation Group, USAR, Tampa, Florida, arrived in Southwest Asia on 13 December 1991 under the command of Colonel Michael T Gaw. The main body of the headquarters arrived on 4 January 1994.[93] Ultimately, as described in the introduction to this paper, the 32nd moved to KKMC and took command of the four motor transport battalions that provided the bulk of the lift for the movement of the two corps westward to their battle positions and then north into Iraq and Kuwait. The road to KKMC was neither certain nor smooth.

Colonel Gaw was an experienced transporter when he took command of the 32nd Group in June 1989. He had served two tours in the movements section of the 143rd Transportation Command, the second as the Assistant Chief of Staff for Movements, and he understood the several modes of transportation operations.[94] Under his command, the 32nd had participated in several exercises, including an over the beach operation in Key West, the Train the Transportation Trace (T4) exercise conducted by the 143rd TRANSCOM in 1990, and Exercise INTERNAL LOOK in July 1990. The 32nd was one of three group headquarters in the wartime CAPSTONE trace of the 143rd TRANSCOM, and when the Gulf War started in August 1990, Colonel Gaw and his troops thought they were ready to go.

On 9 August 1990, Colonel Gaw was notified by Mr Sterling Wood, SSAA, of the 143rd TRANSCOM, that the headquarters was alerted for activation and deployment. This alert status lasted until the unit was called up on 29 November 1990. In the interim, the unit took advantage of its training activities to prepare for a mission in Southwest Asia. Map exercises were conducted, and work was done on preparation for deployment. While the unit was processing at its mobilization station, Fort Eustis, Virginia, it learned that it would be working for the 22nd SUPCOM, established contact with Colonel Whaley, and set up an operations center to assist its three subordinate battalions to get organized and ready to commence operations quickly upon arrival in theater. The word from Colonel Whaley was for the 32nd to get there as soon as possible.[95]

When Colonel Gaw arrived with the advance party and reported to Colonel Whaley, he found that there was some uncertainty about the group's mission. The first information received in September 1990 was that the 32nd Group would take over operation of the Port of Jeddah, at that time still considered a logical alternative that might have to be used if Jubayl and Dammam were inadequate or threatened by enemy action. When it became apparent in October 1990 that Jeddah would not be needed as a major port, the 32nd was informed that its mission would be to conduct motor transport operations from Log Base Bastogne. Colonel Whaley told the newly arrived group commander that it looked as if the 32nd would be based at KKMC to support the corps and manage the prepositioning of supplies at two new log bases northwest of KKMC. This would have left the 7th Group operating the two ports and the 32nd Group operating all motor transport operations from the ports inland. The 7th Group favored assuming the corps support mission, with the 32nd Group operating the ports. By this time, the 32nd Group had its command and control network established, but the issue was not decided until mid-January 1991, when General Pagonis himself decided on the division of labor between the two transportation group headquarters. Pagonis wanted to make certain that the key mission of transporting the corps would be done properly, and he asked Colonel Gaw his opinion of having the 32nd Group do the ports. Colonel Gaw replied, "You would be making a big mistake." Given the expression of confidence that he was seeking, General Pagonis confirmed that the 32nd Group would have the mission as the forward headquarters to command the transportation support for the ground maneuver about to commence.[96]

After the dust had settled on the mission of the group, Colonel Gaw set out to plan his operation. The general division of labor that applied left the 7th Group to operate the ports and move the supplies to the initial log bases, while the 32nd would take over the KKMC and the new log bases to the northeast.[97]

The ARCENT concept for support of General Schwartzkopf's maneuver scheme weighted the effort forward of KKMC, including transportation. There were about 3.5 trucks forward of KKMC for every truck that remained in the South.[98] The two corps each had about 500

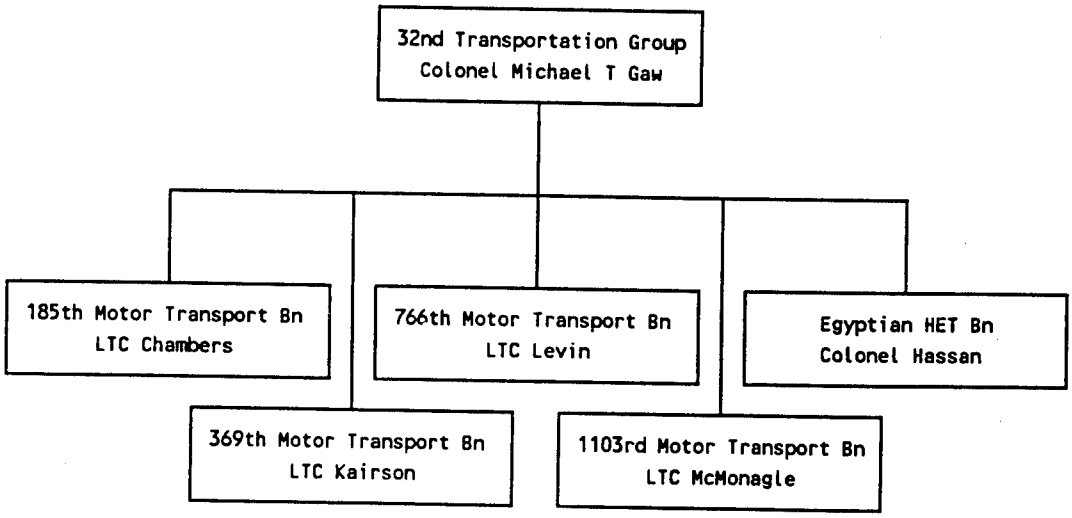
medium cargo trucks and 100 HETs in their support commands. The 32nd Group brought another 700 medium cargo trucks and--most importantly--about 1,000 HETs and lowboys to augment the corps assets.

The primary tasks of the trucks of the 32nd Group were moving ammunition and supplies to the new forward log bases, moving the equipment, personnel, and supplies of the two corps to their forward attack positions, moving north with the corps during the group offensive, sustaining the corps with food and ammunition during the attack, and after the combat ended, moving personnel, equipment, and supplies back to the ports.[99]

The composition of the 32nd Transportation Group is shown in Figure 17. Three of the battalions, the 185th, 369th, and 766th had been identified before deployment as part of the group, and the 1103rd was added after the Group headquarters arrived in the theater.

Figure 17.

32nd Transportation Group



185th Transportation Battalion (Truck)

The 185th Transportation Battalion (Truck), ARNG, from Fresno, California, arrived in the theater in early January 1991 and started operations as soon as its truck companies arrived. The initial mission of the 185th was to provide medium truck support for the movement of XVIII Airborne Corps organizations from their initial locations in the east to their new attack positions in the west. As soon as the personnel of the truck companies arrived by air at Dhahran and married up with their equipment, they moved directly to Log Base Bastogne to pick up cargo and form convoys to the new log bases being stocked to support the ground attack. The 185th coordinated with a total of 22 truck companies to support the movement of the 3rd Armored Cavalry Regiment, 24th Infantry Division, 101st Air Assault Division, and the 82nd Airborne Division.[100] The composition of the 185th Transportation Battalion is shown in Figure 18.

Figure 18.

Composition of the 185th Transportation Battalion (Truck)

Unit	Component	Home Station
424th Medium Truck Company	USAR	Galax, VA
542nd Medium Truck Company	USAR	Kingsbury, IN
1486th Medium Truck Company	ARNG	Ashland, OH
1487th Medium Truck Company	ARNG	Eaton, OH

766th Transportation Battalion (Truck)

The headquarters of the 766th Transportation Battalion (Truck), a USAR unit from Evansville, Indiana, was mobilized on 17 November 1990 at Fort Ben Harrison, Indiana, and deployed to the Gulf on 2 December 1990. The initial few days of its activation were turbulent as three key personnel, to include the battalion commander, surfaced problems which caused them to be non-deployable. The battalion executive officer had only been in the battalion for two months. Further exacerbating the turbulence was the fact that the newly appointed commander was not a Transportation Corps officer. But LTC(P) Ron Levin had commanded two battalions already and he knew how to lead. The 123rd ARCOM Commander, MG Marvin Back, selected him to do the job because, considering the turbulence in the headquarters, he wanted the troops to have the steadiest leadership possible. Then too, LTC Levin was an

experienced logistician as a QM officer, so he had appreciation for the role of a motor transport battalion. Colonel Levin assumed command the day the battalion deployed.[101]

The 766th headquarters arrived at the port of Dammam and remained there for about two weeks. The battalion was then ordered to establish a desert base camp about 25 miles Southwest of KKMC which became Log Base Bravo. There was only a Syrian Army unit and a French Foreign Legion unit in the vicinity. MPs came by to check on the 766th every day or two. The battalion headquarters began to receive its companies after about one month, and then the transportation missions began under the supervision of the 32nd Transportation Group. For that first month at the log base the members of the headquarters felt alone and insecure, with only some passing Bedouins and the occasional MP patrol for company.

The composition of the 766th Transportation Battalion is shown in Figure 19. Primarily the battalion hauled spare parts, PATRIOT missiles, and ammunition in support of VII Corps. Their line-haul before the air combat began was from the port of Dammam to Log Base Echo, which was about a 500 mile trip one way. In late January 1991, the battalion re-located to Log Base Echo and by 1 February had six medium truck companies and one trailer transfer point fully operational there. During the ground war, continual transportation support of sustainment supplies--food, ammunition, and repair parts--was provided to VII Corps elements as they moved deep into Iraqi territory. Once the ground combat phase ended, the 766th started to provide support to the XVIII Airborne Corps redeployment, as well as VII Corps. The 766th also hauled relief supplies into Kuwait while the corps were withdrawing.

The 766th experienced the same problems with inadequate communications for command and control; the lack of control and accountability for trailers; and the stealing of tie-downs and ratchets. The 766th convoy missions became longer than those of many units, however, as they continued to move farther north and away from the port (Dammam). Some of the line-hauls were almost 1,000 miles one way and days would go by before contact was reestablished. Good platoon leadership and responsible E4 and E5 drivers kept things on the right track.

For the entire period of the deployment, the battalion's operational rate exceeded 95%, a remarkable performance attributed to the versatility and multiple talents of the Reservists' civilian skills. These units didn't have to wait on direct support maintenance units for repairs--their own mechanics could change a diesel engine in a tractor in one day or rebuild a transmission. One company had the nucleus of an entire Area Maintenance and Support Activity (AMSA) shop in its maintenance section.

Electricians, carpenters, and masons made the tents and areas around them much more liveable and attractive than the average Army unit experienced. This helped greatly during the cold and flooding of the winter and the dust storms of the spring and summer when the tents

could be sealed, flooring built, and run-off ditches prepared.

One thing that astounded the battalion's leaders was how well the female soldiers adjusted to the conditions, and the strength and resiliency they showed in working the protracted periods required, especially the long days of line-haul driving. The current commander, LTC Sprague, who was the executive officer during Operation DESERT STORM, remarked on the large number of female soldiers in the 740th Transportation Company, a truck company from South Dakota. He stated that those soldiers were all very feminine, but they wheeled their tractors and trailers on the MSRs with the best of the male drivers. They could maneuver their rigs beautifully in tight spots at the docks, and they were most reliable in doing the mission, i.e., delivering the supplies to the right place on time. Fatigue didn't seem to bother them as much as it did the males. Colonel Levin believes this was because the members of that company were from rural areas in South Dakota and were used to dealing with hardship and environmentally harsh conditions. The composition of the 766th Transportation Battalion is shown in Figure 19.

Figure 19.

Composition of the 766th Transportation Battalion

Unit	Component	Home Station
131st Medium Truck Company*	ARNG	Williamstown, PA
227th Medium Truck Company	USAR	Albemarle, NC
740th Medium Truck Company	ARNG	Milbank, SD
762nd Medium Truck Company	USAR	Canton, OH
890th Medium Truck Company	USAR	Green Bay, WI
1221st Medium Truck Company	ARNG	Dexter, MO
189th TC Detachment Trailer Transfer	USAR	Council Bluffs, IA

*NOTE: The 131st Medium Truck Company was assigned in January 1991.

369th Transportation Battalion (Truck)

The 369th Transportation Battalion (Truck), ARNG, New York, commanded by Lieutenant Colonel Francis W. Kairson, Jr, had the task of commanding five US Army HET

companies, providing under one battalion a total of 100 HETs. The composition of the 369th Battalion is shown in Figure 20.

The 369th was intensively utilized in preparing XVIII Airborne Corps for its advance during the ground war. Hundreds of pieces of engineering equipment were moved north from Tapline Road to the border with Iraq. This equipment was used to prepare roads, breach barriers, and attack defensive positions once the ground war began.

The 369th also was tasked to lift the "Tiger Brigade" to the Marines' attack positions into Kuwait while the brigade was attached to provide heavy armor support. A reinforced platoon of HETS remained with the "Tiger Brigade" throughout the ground war before returning to KKMC. (The 369th originally operated out of Dhahran and was moved to KKMC to support the ground war.) Following the ground war the 369th was relocated to Log Base Echo to assist both corps in their redeployment from the Gulf.

The 369th experienced severe maintenance problems with their U.S. made HETS, because the weight of the M1A1 tanks they were tasked to move far exceeded the weight capacity of the HETS--by about 10,000 pounds! Nevertheless, the battalion remained an operationally effective unit throughout its stay in Saudi Arabia, the overloading notwithstanding.

Figure 20.

Composition of the 369th Transportation Battalion (Truck)

Unit	Component	Home Station
217th Heavy Truck Company	USAR	San Antonio, TX
287th Heavy Truck Company	USAR	Livingston, AL
720th Heavy Truck Company	ARNG	Las Vegas, NV
660th Heavy Truck Company	USAR	Cadiz, OH
1569th Light-Medium Truck Company	ARNG	New York, NY
2123rd Heavy Truck Company	ARNG	Bowling Green, KY

1103rd Transportation Battalion (HET)

The 1103rd Transportation Battalion Headquarters, ARNG, was mobilized on 11 December 1990 at its home station of Eufala, Alabama. After processing at Fort Dix, New Jersey, the headquarters arrived in Saudi Arabia on 28 December 1990 and was assigned to the 32nd Transportation Group. The 1103rd took command of five truck companies that had deployed without their own trucks. The composition of the battalion is shown in Figure 21. The mission of the battalion was to command, control, drive, and maintain a fleet of commercially leased, purchased, and contracted HET tractors and trailers.[102]

Figure 21.

Composition of the 1103rd Transportation Battalion (HET)

Unit	Component	Home Station
471st Light Truck Company	AC	Fort Sill, OK
1245th Light-Medium Truck Company	ARNG	Tishomongo, OK
1345th Light-Medium Truck Company	ARNG	Ardmore, OK
1438th Light-Medium Truck Company	ARNG	Camp Atterbury, IN
1485th Light-Medium Truck Company	ARNG	Mansfield, OH
1157th Light-Medium Truck Company	ARNG	Oshkosh, WI

Upon arrival the battalion took over 535 HETs and undertook its initial mission of moving the VII Corps complement of tanks and Bradley Fighting Vehicles from the ports of Dammam and Al Jabayl to forward tactical assembly areas along the Iraq and Kuwait borders. The battalion ultimately grew to a strength of 1,200 personnel and 790 HETs, operating from Dammam, Al Jubayl, and KKMC along 910 miles of MSR. On 24 January 1991, the battalion was assigned to the 7th Transportation Group but placed OPCON to the 32nd Group. At its peak operational strength, the 1103rd had over 1,000 HETs under its control.[103]

The battalion dealt with its commercially leased assets through host nation contractors, and there were concerns that the local and third country national drivers would refuse to enter the forward areas once the air war started. To hedge against this possibility, each civilian HET driver was accompanied by a U.S. soldier who would act as co-driver. The duties of the co-

driver were to assure that the HETs got to the proper destination and also to take over the driving job if the civilian drivers quit or refused to proceed. The use of US troops as co-drivers required the retraining of 1,000 US soldiers as HET drivers. The 32nd Group and the 1103rd set up a training area at the pier area at Dammam and provided HET driver training around-the-clock to the personnel of the truck companies as they arrived from the US.[104]

This unique and unprecedented operation was not without its problems. Although the host nation contractors gave good support to the operation, the host nation drivers were "almost totally uncontrollable." While this may have been an overstatement, dealing with the host nation and third country drivers required both patience and a willingness to stretch policy. At first, the host nation drivers were not allowed to use the convoy service centers, so they had to buy their own food and fuel. If they ran out of cash, they simply went back to the port without telling anyone. This caused a severe lack of control, so the policy was changed to allow all drivers to use the convoy service centers.[105]

Instructions for soldiers accompanying the commercial drivers were to stay with the truck no matter what happened. This policy was established to provide some kind of control, no matter how tenuous. The drivers tended not only to pray four times daily, but would tend to stop and make tea at various times. The practice of lighting small fires to cook food or make tea at rest stops made the Americans nervous when these fires were close to trucks loaded with ammunition, and so some measures were taken to keep the fires away from the ammo. The soldiers of the 471st Transportation Company preferred to do the driving themselves rather than ride as "shotgun" for the host nation or third country drivers.[106]

There were special concerns about the reliability of the host nation and third country drivers as the combat phase started. The local drivers understandably were concerned about the possible effects of poison gas, and they wanted some protection against this threat. The situation came to a head on the night before the start of the ground campaign, when some drivers at Dammam wanted to leave their trucks. Colonel Gaw and Lieutenant Colonel McMonagle had anticipated this problem and had arranged for armed guards to man the closed gates to prevent the drivers from leaving. Colonel Gaw went to the port to talk to the contractors. Agreement was reached that those Saudis who owned their own vehicles could not be prevented legally from leaving. The contractors providing vehicles agreed to having U.S. soldiers ride with their drivers. The U.S. co-drivers would each have two gas masks, one for issue to the local driver in case of attack. This arrangement settled the problem, and the host nation and third country drivers did the job once they were suitably protected.[107]

The 1103rd HET Battalion lifted more than 6,000 pieces of heavy equipment over 5¼ million miles of two-lane road or desert terrain, with no deaths or injuries from accidents. The battalion maintained an operational readiness rate of over 85% with a fleet that included 790

heavy tractors of 15 different makes and 25 different types of heavy equipment trailers. It was an impressive operation.

Egyptian HET Battalion

Equally impressive was the contribution of the Egyptian HET Battalion under the command of Colonel Hassan Hassan Al Shafei. On 10 January 1991, Colonel Whaley placed the Egyptian Heavy Equipment Transporter Battalion under the operational control of the 32nd Group. The 32nd sent a liaison team to the port of Yanbu on the Red Sea to meet the Egyptian unit and escort them on their overland trip to KKMC. After a three day road trip and a stop at the Egyptian Army contingent to drop off some equipment, the Egyptian Battalion arrived at KKMC on 16 January 1991 with 100 HETs. The Egyptians were "super troops" who did a good job. Major John Kacsan was assigned as liaison officer to the Egyptian Battalion from the 32nd Group and developed a warm and personal relationship with Colonel Hassan.[108] The Egyptian equipment was good--simple and capable. They took good care of their trucks, spending a lot of time on maintenance, and providing without fail 40 trucks daily for operational missions.[109]

KKMC Bus and Truck Company

Another unique operation was the KKMC Bus and Truck Company, equipped with an odd assortment of 100 commercial buses and 71 cargo trucks driven by 166 converted infantrymen of the Berlin Brigade, augmented by some NCOs from the 32nd Group. The infantry soldiers had arrived in theater in January 1991 expecting an infantry mission and were disappointed when pressed into service as bus drivers. Nevertheless, they did the job, moving passengers and cargo from the KKMC airfield and in the local area. Their commander reported directly to 32nd Group Headquarters. The provisional KKMC Bus and Truck company was organized into 3 bus platoons and 2 truck platoons and kept busy moving incoming passengers and cargo from KKMC Airfield to their destinations, EPWs on their way to the rear, personnel moving in the local area, and finally troops going home. The company also operated a bus recovery operation to police up the numerous busses that were abandoned along the MSRs for one reason or another. Although the infantrymen were not highly enthusiastic bus drivers, they did a very effective job and contributed greatly to the overall transportation effort.[110]

Saudi Truck Battalion

In mid-February 1991, over 400 Saudi flatbed and cargo trucks under host nation contract

were made available to the 32nd Group. These vehicles were organized into a provisional battalion under the supervision of Captain Fred Munro initially and then Captain Randall Young. Under the direction of the 32nd Group Operations Section, the Saudi trucks were used to lift bottled water, rations, ammunition and parts from Log Base Bravo to the forward log bases and to perform many smaller local haul missions.

Support of the Ground Attack

The mission of the 32nd Group during the ground attack was to provide support for the advance of the two combat corps northward in the attack, and support the Tiger Brigade operating with the Marine Corps in the East. The 7th Group mission was to continue moving cargo from the ports and conduct line haul operations to deliver cargo to Log Bases Bravo, Charlie, and Echo. The 32nd Group moved cargo from these log bases to new logbases, established about 90 miles north of the line of departure for the attack.[111]

As soon as the two corps were in their attack positions, Colonel Gaw realigned his truck assets to support the rapid movement of the combat units northward into Iraq. The concept was to follow the corps closely with truck convoys carrying essential cargo--primarily rations and ammunition. The 185th Motor Transport Battalion was placed in support of XVIII Airborne Corps, operating with five medium truck companies from Log Base Charlie. The 766th Motor Transport Battalion was placed in support of VII Corps, operating with six medium truck companies from Log Base Echo. The 369th HET Battalion and the Egyptian HET Battalion were to provide, from KKMC or Log Base Bravo respectively, heavy lift and retrograde (of damaged equipment) for both corps as required. The KKMC provisional bus and truck company was used to support the airfield at KKMC, which became a major APOD during this phase of the operation for onward movement of passengers and cargo to forward airfields. The 189th Trailer Transfer Point was located at Log Base Echo to handle all medium trucks arriving there with trailers for Log Base Echo or Log Base Charlie. The Saudi Truck Battalion undertook numerous smaller lift missions during this period, allowing the military truck companies to concentrate on support of the forward corps advancing into Iraq.[112]

The 32nd Group Headquarters also reorganized for the ground attack. Colonel Gaw moved with a jump tactical operations center under Major Jack Stultz north from Log Base Echo behind VII Corps to coordinate motor transport operations in the attack. At Log Base Charlie, a liaison team under Captain Anthony Daquila, coordinated support for XVIII Airborne Corps, and at Log Base Echo, a liaison team under Captain Stacey Barrentine and Captain Dan Schultz did the same for VII Corps. Major John Kacsan headed the liaison team with the Egyptian HET Battalion, and Captain Fred Munro was the team leader with the Saudi Truck Battalion. The main headquarters of the Group remained at KKMC under Major Scott, and two teams under

First Lieutenants James Bowen and Rita Corbine coordinated truck support for the KKMC local area and the APOD at KKMC respectively.[113]

The combat operation and the truck convoys barely slowed down once the attack began. The trucks had been maintained, the trailers loaded with supplies, and the drivers rested for the march northward. Medium truck companies carried water, rations, ammunition, and other supplies right behind the advancing tank columns, often delivering supplies directly to the units. Hospitals were loaded on 20 ton trailers and carried along in the convoys moving northward. The truck units did everything they could to support the rapidly moving combat units, including pulling fuel trailers when there were too few of the 475th POL Group's tractors to keep up.[114] The result of the combined efforts of the truck companies of the two corps and the 7th and 32nd Groups was that the campaign was able to proceed rapidly to a successful culmination without having to slow down or stop while waiting for supplies to catch up from the rear.

Retrograde Operations

Once the war was won and combat ceased, the combat troops regrouped and clamored to go home, but the work was not over for the transporters, who had to move the units, equipment, and supplies back to the ports for transport back to their original locations. The retrograde phase was not as urgent as the movements preceding the ground war, but it was a mammoth job, and there was some time pressure, for the Saudis wanted the Americans to leave as soon as possible.

The 32nd Group was put in charge of all motor transport line haul operations for the retrograde phase from 10 March 1991 until the headquarters redeployed to CONUS on 30 June 1991.[115] It was determined that the 32nd Group would take control of all of the motor transport battalions of the 7th and 32nd Groups for the coordinated movement of materiel to the ports. The 1103rd, 68th, 180th, and 419th Transportation Battalions were made OPCON to the 32nd Group, bringing that headquarters' span of control to nine battalions, including the Egyptian HET Battalion.[116] The operation was controlled from the 32nd Group Headquarters at KKMC, with battalions and trailer transfer points at Log Bases Echo, Alpha, Bravo, and Bastogne, and the Port of Dammam. At this time, the 32nd Group had a strength of over 6,000 soldiers and 3,000 trucks.[117]

The retrograde movement was accomplished in two general phases. The first consisted of the movement of most of the units from their locations at the cease fire to the ports. The second consisted of the movement of supplies and additional units to the ports. The 32nd Group sent staff officers to each redeploying unit to work out details of transportation support for the moves.[118] Figure 22 shows the general organization and timing of the retrograde movements.

During the retrograde operations, the 32nd Group provided 8,000 truck loads to the VII Corps and 6,000 to the XVIII Airborne Corps.[119] All this time, the 32nd was also engaged in bringing Class I and other supplies forward from the ports to the log bases to sustain units in the forward areas, including Iraqi and Kuwaiti personnel.

Figure 22.

Retrograde Movements

Phase I: 10 Mar - 20 May 1991

Element	From	To
XVIII Airborne Corps	Log Base C	Port
1st Cavalry Division	Log Base E	Port
Tiger Brigade	Kuwait	Port
VII Corps	Iraq	vic KKMC
VII Corps	Log Bases E & C	Port
Supplies, Ammunition	Iraq & Kuwait	KKMC & Port
EAC Units	KKMC	Port

Phase II: 21 May - 30 Jun 1991

Element	From	To
Supplies	KKMC	Port
EAC Units	KKMC	Port
11th Armored Cavalry Regiment	KKMC	Kuwait
1st Brigade, 3rd Armored Division	Kuwait	Port
Captured Equipment & Ammunition	Iraq & Kuwait	Port
32nd Group HQ & Units	KKMC	Port

As the retrograde operations progressed, the transportation units were themselves redeployed, so the assets available to carry the cargo declined as the cargo itself was moved to

the ports and placed on ships. Finally, after most of its truck companies and battalions were gone, Headquarters, 32nd Transportation Group itself stood down on 1 July 1991 and redeployed with the knowledge that it had presided over the most remarkable truck line-haul operation in military history.[120] Colonel Mike Gaw and his staff of the 32nd Transportation Group had done the job asked of them and done it well. The truck drivers, mechanics, NCOs, and staff officers of the Army Reserve, National Guard, and Active Army had worked together under the 32nd Group as a team, and Colonel Gaw emerged from the war with a reputation as an effective commander universally admired by his subordinates, peers, and superiors.

Residual truck operations and port operations were continued under the 7th Transportation Group until mid-August 1991, when almost all of the redeployment and retrograde operations had been completed and the 7th Group Headquarters also moved back to CONUS.

The single most dramatic event in the transportation operations in the theater occurred on 3 May 1991, when the entire Tiger Brigade (1st Brigade, 2nd Armored Division) was moved a distance of 350 miles simultaneously in a single lift of 486 HETs.[121] This event was awesome to observers who saw a fleet of armored vehicles drive out of the dust to a host of waiting trailers, load, and move together in a single, concerted movement.[122] This event, and the transportation operations that preceded it, illustrate well the dependency of the Army's combat forces on HETs for operational mobility. While tracked vehicles have great tactical mobility for short range cross-country movement on the battlefield, they have to be moved by wheeled vehicles to get to the battlefield rapidly and in condition to fight. In a larger sense, this single lift operation epitomized the extent to which the war with Iraq was a transportation war.

Problems with Transportation Operations

There were numerous problems with the transportation operation. Accidents, flat tires, maintenance, and the erratic driving habits of host nation and third country drivers all were problems. But the most serious problems stemmed from mistakes that were made by the Army itself.

Movement Control Doctrine

As noted earlier, there is criticism of the movement control system within the theater, but few Transportation Corps Officers find fault with their own doctrine and instead rationalize the failure of the system by finding fault in its implementation. This kind of rationalization permits the Transportation Corps to avoid looking hard at a system of dual command that

inherently places its movement control personnel at odds with both the transportation mode operators and the logistical materiel managers. Perhaps, it would be prudent at least to look objectively at a way to reconcile the conflicting attitudes and incentives of these three disparate groups of EAC headquarters. The unwillingness of many using units and organizations to adhere to the discipline of the theater distribution system also needs to be approached honestly. A lack of discipline that would not be tolerated in combat operations appeared to be tacitly acceptable in service support operations.

Poor Communications

It is axiomatic that effective operation of a transportation network demands effective communications. During the War with Iraq, communications was poor because the transportation units lacked their own means and the theater area communications system they were supposed to be able to use was never put in place.[123] According to the 32nd Group, "The severe lack of communication hindered the ability to command and control movements...[and] degraded the efficient coordination and support prior to and during all phases of the transportation mission."[124] While it is expensive to provide the transporters with their own communications system, it may be even more expensive to continue to allow transportion assets to be used inefficiently because of lack of timely information.

Equipment Authorizations and Allocations

It is apparent that the Army did not have enough of the right kinds of trucks, trailers, and auxiliary equipment to support the maneuver of the forces. Thousands of commercial vehicles were used to augment the military truck fleet, and many of the deploying units were issued new trucks just before deploying--presumably because the vehicles they had on hand were obsolete. This nullified much of the training the units had performed in the previous months, and required these units to re-train on new equipment while they were trying to deploy. The clear implication is that the traditional practice of equipping reserve units with old equipment that has to be replaced upon mobilization is inconsistent with the demands of theater operations for a major regional war--especially one where we must get there fast with contingency force pool units that will not have the luxury of post-mobilization train-up time.

The problems caused by shortages of drivers and trailers raise the issue of the adequacy of authorizations for these resources in the truck companies. The experience of the war implies that having "extra" drivers and more than two trailers per truck-tractor would be more efficient in wartime than allowing vehicles to remain idle for lack of either. Maintaining AC or RC truck companies at reduced strength in peacetime is also a false economy that degrades a rapid

deployment capability and makes it necessary to find additional drivers or equipment on short notice to provide the necessary line haul capacity. To meet demands for rapid deployment, peacetime authorizations need to match wartime requirements more closely, particularly in RC units.

There was a lack of materials handling equipment (MHE) in the combat organizations that made it difficult for the troops in the forward areas to download the trailers that were dropped off in their support areas. Instead of offloading the cargo (often heavy ammunition pallets) by hand, the units often elected to keep the cargo loaded on the trailers and take off just what was needed at a particular moment. This technique also had the advantage to the using units that they were ready to move out quickly with their supplies. Unfortunately, an inability to download trailers easily in the forward areas contributed to a shortage of trailers to haul additional supplies from the ports. Additional MHE for the forward units might have alleviated some of this problem.

Motor Transport Operator Shortages

One of the problems that came up in motor transport operations was a severe shortage of motor transport operators (MOS 88M) that had to be overcome by a combination of innovation and desperation. Once the VII Corps movement started and the magnitude of the westward haul became apparent, it also became apparent that there would be insufficient drivers to do all of the necessary driving. Even after thousands of local nationals and third country nationals were hired by contractors to drive commercial vehicles, there was still a severe shortage of qualified 88Ms for the military trucks.

There are four principal reasons for the military driver shortage, most of them due to faulty peacetime economies.[125]

1. Many of the truck companies in the National Guard and Army Reserve were staffed with one driver per vehicle, sufficient for one-shift operations but not for the two-shift operations required in the theater of operations.

2. Many of the units deploying from Germany converted 88M personnel into tank crewmen to compensate for shortages in those skills, leaving some of their trucks without qualified operators. The Army Chief of Staff had established in 1989 a policy that truck drivers in combat arms units would be converted to the predominate combat MOS of the unit, such as tank crewman or infantryman. As a result, it was possible to offset shortages of combat personnel by taking drivers from unit vehicles. Many of the VII Corps units deployed with full tank crews but with too few drivers for their trucks.

3. Many officers and NCOs wanted drivers for their utility vehicles, removing them in some instances from the cabs of trucks.

4. Some of the truck companies deployed to the theater were Type B units that had full equipment sets but insufficient lower grade enlisted personnel to achieve full operational capability. Type B units are designed to be filled out by local hires, but this did not work very well in Saudi Arabia.[126]

The simple solution of just assigning any soldiers to drive trucks that may have been possible in earlier times, was no longer possible in 1990. The times had long passed when the typical American boy was an automotive expert who could hop into a truck and drive it off without any training. Almost all Army recruits could drive automobiles, but few had experience in driving heavy trucks or truck-tractors with semi-trailers. Current standard Army trucks are huge, complicated machines that require specialized training before they can be operated safely and effectively.

The Army resorted to several novel solutions to the 88M shortage:

- An air defense battalion from Fort Lewis Washington was deployed without its air defense weapons after a short period of training on motor vehicle operation. (See earlier discussion)

- An infantry company from the Berlin Brigade was deployed without equipment and its members retrained as drivers for the provisional bus company of the 32nd Transportation Group. (See earlier discussion)

- Several thousand IRR volunteers were trained or refresher trained as motor vehicle operators by the Army Training and Doctrine Command (TRADOC), then deployed as individuals to the theater.

- Many personnel already qualified as medium truck operators had to be qualified to drive the HETs, and most of this training was done in the theater.

TRADOC had the mission of training 1,000 HET operators quickly to help fill the need in the theater. The Transportation School prepared a short course of four weeks (compared to 8½ weeks for the regular course) that was given at Fort Dix, New Jersey, and Fort Leonard Wood, Missouri. One hundred ten commercial HETs were leased for the training, and combat tanks to be carried were simulated using water tanks. Army Reserve instructors were used to augment mobile training teams from the Transportation School. While there were difficulties, including a continuing shortage of HETs, insufficient operators manuals, and support vehicle

drivers, the mission was accomplished.[127] In December 1990, 1,500 IRR personnel with MOS 88M answered a call for volunteers to receive a special five day refresher course at Fort Dix, New Jersey, and then be deployed to the theater.[128]

Ultimately, the driver shortage was overcome by the urgent actions described above and by using thousands of local drivers and third country nationals. However, the causes of the driver shortage remain, and the Army needs to consider what actions can assure that in a future operation it will be able to maximize the use of its own trucks.

Heavy Equipment Transporter Shortages

The narrative demonstrates the extraordinary measures the Army took to overcome its shortage of heavy equipment transporters (HETs). The shortage was self-inflicted, for the Army preferred to invest its limited acquisition dollars in tanks rather than tank transporters, to a degree because the Army was planning to fight in Europe and use railroads there to move tanks from ports to the front lines. Thus, on the eve of the war, the Army had only 112 HETs, the Marines 34, while the Iraqis had 3,000.[129] A US heavy division with over 300 tanks had only 6 HETs.

Once the operation in Southwest Asia got underway, it became obvious that HETs would be needed to move heavy armored vehicles. Moving the vehicles on their own tracks would wear out the tracks on the vehicles and--more important even--would destroy the fragile roads in the area. The need for HETs in large numbers became crucial as the CENTCOM planners settled on a ground attack concept that would require moving two army corps long distances in a short time to move into position to execute the contemplated flank envelopment of the Iraqi forces.

Once again lack of proper preparation was overcome by brilliant and energetic improvisation. Allies were prevailed upon to provide HETs; additional military and civilian HETs were purchased; and the considerable HET fleet in Saudi Arabia (where the locals had learned to protect their roads) was pressed into service. The HET fleet finally assembled is shown in Figure 23.[130]

Figure 23.

Sources of HETs

US Military:	497
US Commercial:	48
US Trucking Industry:	51
HNS Commercial:	333
Egypt:	100
Italy:	60
Germany:	181
Czechoslovakia:	40
Total:	1,310

The total number of HETs made available was adequate--but barely--for the job to be done. The slim numbers had to be completely effective, and this was achieved by putting all of the HETs under central control of the 32nd Transportation Group. All Army HET companies were placed under the 369th Transportation Battalion Headquarters. The commercial HETs were placed under the command and control of the 1103rd Transportation Battalion and five truck companies deployed without their own trucks to operate them. The Egyptian HET Battalion performed as a unit and did a magnificent job. The 32nd Group staff paid close attention to the HET assets to get maximum performance and assure that the unit moves supported the maneuver plan for the ground war. The Army got by with improvisation on this one, but the lesson is clear that more HETs are going to be needed for a future war of this type.

Trailer Control

One of the more serious problems was losing control of trailers as time passed. Each truck-tractor is paired with two cargo or flatbed semi-trailers so that a truck can proceed to a destination (trailer transfer point, log base, or unit rear area), drop the loaded trailer, return to the point of origin, and haul the second loaded trailer back with another load. If the system is working right, on the second trip, the truck drops the loaded trailer then picks up an empty trailer to return to the depot to be reloaded in turn. This system is designed to allow a truck-tractor to be used with maximum efficiency.

The trailer transfer system did not work well in the War with Iraq for several reasons. Some of the possible reasons for this is that two trailers per truck-tractor were too few; more materials handling equipment was needed in the forward areas, and units did not cooperate by

returning trailers expeditiously to transportation units (as recounted above in the section on movement control). These issues, however, are only manifestations or symptoms of the changing role of loaded trailers in a rapidly moving airland battle. Older concepts of forward supply points as stacks of supplies on the ground beside a road may have to give way to a new concept of a forward supply point as many loaded trailers beside a road. The advantages of loaded trailers for convenient storage and rapid movement (provided truck-tractors are available) are very attractive to the combat units, whose support is the object of the exercise. This is but one example of the major changes in the way the Army transports its supplies that are likely to emerge ultimately from examination of the experience in Southwest Asia.

The Transportation Corps in Operation DESERT STORM

The Transportation Corps played a big role in Operation DESERT STORM, and it used 56% of its TOE units to do that. All of its heavy truck companies, 88% of its medium truck petroleum truck companies, 74% of its medium truck cargo companies, half of its light and light-medium truck companies, half of its terminal units, a quarter of its watercraft units, and 81% of its movement control detachments deployed to Southwest Asia.[131] The total number of Transportation Corps personnel in the theater was about 23,400, or just over 8% of the total strength of ARCENT.[132] The Transportation Corps effort was a total force effort. Of the total of 255 Transportation units deployed, 106 were Active Component, 74 were National Guard, and 75 were Army Reserve.[133] By all accounts, the Components worked well together, perhaps because the Transportation Corps does an effective job of persuading all of its officers and enlisted personnel of the professional nature of the transportation mission.

The measures of accomplishment by the Transportation Corps in the Southwest Asia Theater are so vast as to be almost meaningless. Over 500 ships were discharged, 10,000 aircraft received, 12,000 tracked vehicles transported, and 117,000 wheeled vehicles, 1,800 helicopters, and 33,000 containers were received and processed. About 1.8 million tons of cargo, including 350,000 tons of ammunition, and 374,000 personnel were received and moved onward.[134] All of these items were moved in, and most of it was moved back out after the war was won. Truly, this was a remarkable achievement.

The review of transportation operations does reveal some potential problems for another similar operation. Despite the fact that the bulk of military truck assets were deployed in the theater, it was necessary to use large numbers of commercial vehicles to get the job done. Transportation terminal and watercraft assets proved to be crucial to the success of the campaign, but were insufficient without support from commercial firms and the availability of excellent ports. Even the large capability of the Army's Transportation Corps was really stretched both by the nature of the theater of operations and the demands of the AirLand Battle

doctrine for rapid mobility on the battlefield and rapid movement of vast quantities of materiel behind the front lines.

The comment, "We're lucky the war did not last longer than five days" is a frequent refrain among logisticians reflecting on the War with Iraq. Except for the medical system, which had more than enough capacity to handle the actual workload, all of the other support functions were strained to the breaking point at the culmination of the campaign. Time and time again, the idea that the communications was just barely adequate, the construction effort maxed out, or the supply system exhausted has been expressed--not as a criticism of the heroic efforts of the troops, but as a simple statement of fact. This sense that the system was stretched to the breaking point was evident particularly in transportation. The effort in hauling the supplies to the initial bases, then moving the units and supplies to western bases, then following the assault elements northward into Iraq and Kuwait, had exhausted the system. When the cease fire was declared, not only were the combat troops glad, but particularly the logisticians and transporters who knew they had no more to give. The trailers were lost; the trucks were in poor condition; the supplies themselves mixed up and unaccounted for; and the drivers were tired. The transportation effort had more than sufficed to assure victory, but it should not represent the ideal of what should be done the next time to provide transportation support for a theater of operations. The people and the equipment were fine, but the management of the enterprise needs improvement.

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End Notes

1. Peter C. Langenus, "Moving An Army: Movement Control for DESERT STORM," Military Review, September 1991, pp 41-51.

2. Information Paper, "22nd Support Command Operation DESERT SHIELD and DESERT STORM Summary of Key Statistics," 4 November 1991.

3. William G. Pagonis, Moving Mountains: Lessons in Leadership and Logistics from the Gulf War, Harvard Business School Press, Boston, 1992, p. 146.

4. Pagonis, op. cit., pp. 138-140, for an excellent account of the briefing of the movement plan.

5. Interview with Major General David A. Whaley, 26 January 1994.

6. Interview with Brigadier General Michael T. Gaw, 13 March 1994.

7. Interview with Brigadier General Michael T. Gaw, 10 January 1994.

8. Interview with Brigadier General Michael T. Gaw, 13 March 1994.

9. 32nd Transportation Group, Command Report, 17 Dec 1991 - 1 Apr 1991.

10. General Jimmy D. Ross, "The Transportation Corps--A Proud Past and a Bright Future," Transportation Corps Bulletin, July 1992, p. 2.

11. Ibid., p. 3-5.

12. ANDRULIS Research Corporation monograph entitled, Port Operations:, The United States Army Reserve in Operation DESERT STORM, prepared for Office of the Chief, Army Reserve, 3 May 1991.

13. Data on transportation unit missions, capacities, and strengths obtained from several sources, including unit fact sheets provided by Major Doris Kubik, OCAR, and the Transportation School. All data have been reviewed by the Transportation School to assure accuracy. This applies to all of the unit data in this section of the paper.

14. 7th Transportation Group Briefing, op. cit.

15. Information about truck companies obtained from Mr Joe A. Fortner, The Transportation School, 6 December 1993.

16. All capacity estimates are based on the assumption that 90% of the vehicles will be operational on the average.

17. Interview, LTC Danny East and Major Doris Kubik, 25 January 1994.

18. Equipment data does not include administrative vehicles.

19. This variant of the Light-Medium Truck Company is organized for one-shift operations, and in 1990 all of these companies were one-shift companies. As the war demonstrated, this was a mistake.

20. Since the Gulf War, the distinction between terminal and motor transport groups has been dropped, and all transportation groups are now composite. The new concept is that a single group can operate a port or group of nearby ports and also move the cargo inland. This allows the theater to be organized vertically when reliance has to be placed on widely scattered ports.

21. Department of the Army, Field Manual 100-10, Combat Service Support, 18 February 1988, pp. 9-1 & 9-2.

22. FM 100-10, op. cit., p. 9-10.

23. Langenus interview, 20 December 1993. Colonel Langenus points out that the corresponding MP teams of 4 enlisted personnel at Traffic Control Points sometimes have insufficient "clout" when dealing with fractious convoy commanders.

24. FM 100-10, op. cit., pp. 1-17 to 1-19.

25. Major Paul L. Willis, Theater Linehaul Transportation Operations during DESERT SHIELD and DESERT STORM, 22nd SUPCOM, undated.

26. William G. Pagonis, Moving Mountains, Lessons in Leadership and Logistics from the Gulf War, Harvard Business School Press, Boston, Massachusetts, 1992, pp. 89-91.

27. LTC Donald D Parker and Captain Jeffrey A Kipers, "Port in a Storm, The 24th Transportation Battalion in Saudi Arabia," Transportation Corps Professional Bulletin, July 1991, p. 6.

28. Briefing, 7th Transportation Group (Terminal), "Operation Desert Shield/Storm," undated.

29. Organization Chart, 7th Transportation Group, as of 7 Jan 91.

30. Colonel Daniel G. Brown, "Lifeline to the Front Line," Transportation Corps Professional Bulletin, July 1991, p. 2.

31. LTC William McKinley and Captain Dale A Hueber, "Army Watercraft Operations in Southwest Asia," Transportation Corps Professional Bulletin, September 1991, pp. 10-14, is the source for this section.

32. The units represented were the 73rd Floating Craft Company, 329th Heavy Boat Company, 558th Floating Craft Maintenance Company, and the 1098th Medium Boat Company, McKinney, op. cit., p. 10.

33. The primary source for this section is the 419th Transportation Battalion, "Unit Historical/Lessons Learned Report," 14 April 1991, forwarded to The Transportation School by Memorandum dated 21 December 1991. This report includes also the reports of the 180th, 619th, 1122nd, and 1461st Transportation Companies and the 544th Transportation Detachment.

34. Trip Report of Theodore S. Silva, ANDRULIS Research Corporation, to Ground Transportation Units in Wisconsin, Illinois, and Indiana, 28 February - 8 March 1994, dated 16 March 1994.

35. Ibid.

36. Ibid.

37. This section is based on Headquarters, 3d Battalion, 2d Air Defense Artillery Regiment, Memorandum for Headquarters 22d SUPCOM, "Unit Historical/Lessons Learned Report," 12 April 1991, and the enclosed article by Major Ronald Sullenger entitled "Flexibility - Mission Essential in the 3-2 ADA Regt."

38. Pagonis, op. cit. p. 77.

39. See ANDRULIS Research Corporation monograph entitled, The Case of the Unit That Was Not Called: The 377th Theater Army Area Command, 6 May 1991, and The Signal Support Dilemma: The 335th Signal Command, 30 October 1992, prepared for the Office of the Chief, Army Reserve, for case studies of two of the other USAR theater functional commands that were not utilized.

40. This section is based on an extensive interview with Major General Craig, 10 January 1994.

41. Brigadier General Robert H. Scales, Jr, et al., Certain Victory, Department of the Army, Washington, DC, 1993, p. 61.

42. Message, HQDA, Subject: "Command and Control in Saudi Arabia," 241801Z Dec 90.

43. Interview with General Craig, 10 January 1994. General Craig points out that the unit was active in establishing a casualty assistance program for Florida and in family support operations.

44. Colonel Whaley was "frocked" as a brigadier general in June 1991 and promoted to the grade on 1 January 1992.

45. Colonel Whaley became DCG of 22nd SUPCOM for Operations and Transportation in Spring 1991 after the departure of Major General James A. Guest, who had been DCG for Operations.

46. Biography, Major General David A. Whaley, undated, furnished by General Whaley's office at Fort Eustis, VA.

47. Interview, with Major General Whaley, 26 January 1994. This interview is the basis for the description of command and control exercised in the theater.

48. Whaley interview, 26 January 1994.

49. Pagonis, op. cit., pp. 89-92. Pagonis had 3 other officers with him when he arrived in Saudi Arabia on 8 August 1990. Another 20 hand-picked logisticians were waiting in CONUS to get priority to deploy to the theater but did not arrive until after the 7th Group had contributed personnel to the support command staff.

50. Whaley interview, 26 January 1994.

51. Whaley interview, 26 January 1994.

52. This section is based on a telephone interview with LTC Jonathan Kent, 19 January 1994.

53. The 417th had landed in Cairo due to a mistake in the routing of the aircraft and waited a week there until two small aircraft brought them to Saudi Arabia.

54. Kent interview, 19 January 1993.

55. Much of the material for the section on the 318th MCA was obtained at a group discussion at Colonel Langenus's residence on 19 December 1993 (318th discussion) and a lengthy discussion with Colonel Langenus on 20 December 1993 (Langenus interview).

56. Biographical Summary, Peter C. Langenus, as of 30 June 1993.

57. Interview with LTC Danny East, 12 January 1994. LTC East served in the Logistics Operations Center during the war and managed the deployment of Transportation Corps units to the theater.

58. Whaley interview, 26 January 1994, and Moloney interview, 12 January 1994.

59. Langenus interview, 20 December 1993.

60. Langenus Interview, 20 December 1993.

61. Stultz interview, 10 January 1994.

62. Whaley interview, 26 January 1994.

63. Whaley interview, 26 January 1994.

64. Telephone interview with LTG Samuel N. Wakefield, 28 February 1994.

65. Wakefield interview, 28 February 1994.

66. The 330th, 229th, and 49th TC Detachments were all movement control centers at the outset of the war and became battalions at some point. They are all termed battalions in this report.

67. Langenus interview, 20 December 1993.

68. Langenus interview, 20 December 1993.

69. Langenus interview, 20 December 1993.

70. According to Colonel Langenus, the 318th received good support from the 89th Military Police Brigade, but the cooperation was impaired by doctrinal fuzziness on the overlap between the MP and movement control function. The MPs established Traffic Control Points and focused on reporting on traffic and clearing accidents. They did little to provide information on convoy status. Langenus interview, 20 December 1993.

71. Langenus interview, 20 December 1993.

72. East interview, 12 January 1994.

73. Intervew with LTC Larry Moloney, 28 January 1994, is the basis for most of this section.

74. Moloney interview, 28 January 1994.

75. Moloney interview, 28 January 1994.

76. Langenus interview, 20 December 1993.

77. Moloney interview, 28 January 1994.

78. Interview, Colonel Victor Hill, 12 and 13 March 1994.

79. Colonel Hill believes that the 7th Group troops sought to prevent the opening of containers at the ports by stacking them too close together to be opened and other devices. Interview, Colonel Hill, 12 & 13 March 1994.

80. Whaley interview, 26 January 1994. According to LTC Moloney, investigations were also initiated against Colonel Langenus, LTC Moloney, and LTC Christopher of the 318th MCA. Colonel Hill says he did this to "harass" the transportation people and focus attention on the need to establish accountability.

81. In reaction to this problem, the concept of a Theater Distribution Management Center (TDMC) was tested successfully during Operation BRIGHT STAR 1992. Operationally, it was devised by Colonels Whaley, Hill, and Langenus during Operation DESERT STORM. BG Thomas Jones of the 21st SUPCOM's CONUS Augmentation Detachment was its first chief. Elements of the MMC and MCA are co-located at the TMDC to work closely together, and disputes are resolved by a senior logistician heading the TMDC. Briefing, 377th TAACOM Wartime Trace Commanders Conference, 12 March 1994.

82. Interview, Colonel Hill, 12 & 13 March 1994.

83. Telephone interview with Lieutenant General Samuel N. Wakefield, Commander, Combined Arms Support Command, 28 February 1994.

84. COL Peter C. Langenus and Major Joseph A. Burro, "Railroad Movements in Support of Operation Desert Storm," Transportation Corps Professional Bulletin, January 1992, pp. 2-5. is the basis for this section.

85. General Whaley agrees he was skeptical at the outset about the use of the railroad, and he give fulls credit to the 318th MCA for persevering to bring the railway into use. Interview with Major General Whaley, 26 January 1994.

86. ARCENT Provisional Support Command Permanent Orders 244-1, 10 September 1990, confirming verbal orders of COMUSARCENT of 8 September 1990.

87. Much of the information about the 93rd Movement Control Battalion is obtained from a copy of a unit book prepared by members of the unit and furnished by LTC Davidson.

88. LTC John M. Davidson, After-Action Report and Observations, January 1994.

89. LTC John M. Davidson, op. cit.

90. LTC Davidson, op. cit.

91. Whaley interview, 26 January 1994.

92. 32nd Transportation Group, "After-Action Review of Operation DESERT SHIELD and STORM," 30 March 1991.

93. Much of the information about the 32nd Group was obtained in extensive separate interviews on 10 January 1994 with General Gaw and LTC Jack Stultz, the group operations officer during the war.

94. General Gaw started his Army career as an Engineer and commanded the 326th Engineer Company of the 173rd Airborne Brigade in Vietnam.

95. Gaw interview, 10 January 1994.

96. Gaw intervew, 10 January 1994. LTC Stultz confirms this conversation.

97. Stultz interview, 10 January 1994.

98. Whaley interview, 26 January 1993.

99. Stultz interview, 10 January 1994.

100. 32nd Group Command Report, 22 February 1991.

101. This entire section on the 766th Transportation Battalion is based upon an extensive interview with COL Levin, LTC Sprague, and Mr. Webb on 7 March 1993 at Fort Ben Harrison, IN. This was accomplished by Theodore S. Silva, ANDRULIS Research Corporation, while visiting transportation units in Wisconsin, Illinois, and Indiana during the period 28 February to 8 March 1994.

102. 471st Transportation Company, "Unit Historical/Lessons Learned Report," 10 April 1991.

103. Gaw interview, 26 January 1994.

104. Gaw interview, 10 January 1994.

105. 1103rd Motor Transport Battalion, op. cit.

106. 1103rd Motor Transport Battalion, op. cit.

107. Gaw interview, 10 January 1994.

108. Gaw interview, 10 January 1994.

109. Stultz interview, 10 January 1994.

110. Gaw interview, 10 January 1994. See also 32nd Transportation Group Command Report, 17 Jan 1991 - 1 April 1991.

111. 32nd Group Command Report, 17 Jan 1991 - 1 Apr 1991.

112. Interview, General Gaw, 13 March 1994.

113. 32nd Transportation Group Command Report, 17 Jan 1991 - 1 April 1991, and After-Action Briefing.

114. 32nd Transportation Group Command Report, 7 Feb 1991 - 1 April 1991.

115. Interview, Brigadier General Michael T. Gaw, 13 March 1994.

116. 32nd Group After Action Briefing, op. cit.

117. 32nd Group After-Action Briefing, op. cit.

118. Stultz interview, 10 January 1994.

119. 32nd Group After-Action Briefing, op. cit.

120. In a single sour note in what was overall a real Total Army experience for him, Major Jack Stultz experienced some unwitting prejudice when an AC officer, the Division Transportation Officer of one of the divisions, unaware that Major Stultz was in the USAR, expressed a distaste for Reservists who are "are not like you or me." Stultz interview, 10 Jan 1994.

121. 32nd Group After Action Briefing, op. cit.

122. Stultz interview, 10 January 1993.

123. ANDRULIS Research Corporation monograph entitled, The United States Army Reserve in DESERT STORM: The 335th Signal Command and Theater Communications, prepared for the Office Chief of the Army Reserve, 30 October 1992.

124. Hqs 32nd Transportation Group, "After Action Review of Operation DESERT SHIELD and STORM," 30 March 1991.

125. Information on driver shortages and training was obtained in an interview with Mr. John Ritter, Training Directorate, Transportation School, 6 Dec 1993.

126. Information on Type B units obtained from Mr Tim Fulton, Force Development Office, The Transportation School, 6 December 1993. Mr Fulton commanded a Type B Terminal Service Company in Viet Nam in 1969 and understands well the advantages and disadvantages of this type of unit.

127. Susan Canedy, et. al., TRADOC Support to Operations Desert Storm and Desert Shield, a Preliminary Study, Office of the Command Historian, TRADOC, 1992, pp. 53 and 54.

128. ANDRULIS Research Corporation monograph entitled, Individual Manpower Mobilization: The Army Reserve Personnel Center, The United States Army Reserve in Operation DESERT STORM, prepared for the Office of the Chief, Army Reserve, 30 November 1992, p. 24.

129. Pagonis, op. cit., p. 203, citing numbers from GAO Report NSIAD 920-10.

130. DOD, Conduct of the Persian Gulf War: Final Report to Congress, April 1992, Appendix F, Table F-4. The difference between the numbers of HETs in the U.S. military, cited in the report of End Note 132, and the 497 HETs in this chart is concluded to result from a crash procurement program after Operation DESERT SHIELD had begun.

131. LTC Daniel W. Kobasa, Major David E. Quimby, and First Lieutenant William E. Bardon, "Transportation Corps Units in Operation Desert Storm," Transportation Corps Professional Bulletin, July 1991, pp. 28 and 29.

132. DA, DAMO-OP, List of Army Units Deployed to SWA, 5 Jun 1992.

133. Kobasa, op. cit., p. 28.

134. Information Paper, 22nd Support Command Operation DESERT SHIELD and DESERT STORM Summary of Key Statistics," 4 Nov 1991.

UNITED STATES ARMY RESERVE
in
OPERATION DESERT STORM

GROUND TRANSPORTATION OPERATIONS

APPENDIX A

U.S. Army Reserve Transportation Corps Railway Units in CONUS[1]

Historical Background

Railroads were first used to supply military forces during the American Civil War. Initially, railroads were operated under contract to the Army Commanders in the field or through the War Department. As with other operations, it became evident that railroads in a theater of operations must be under the control of the military commander. In 1862, the Military Railway Service was formed as an integral part of the Union Army. At its maximum strength during the Civil War, the Military Railway Service consisted of 24,964 men.

During World War I the Military Railway Service was revived and rose to a total strength of 83,000 men, 69,000 of whom served overseas. This was the largest strength the Railway Service ever attained. In World War II, 43,500 soldier railroaders served in the Army.

During the Korean War, railroads were vital to logistical supply and in support of tactical operations, because large numbers of troops, trucks, and artillery could be moved substantial distances in harsh climate and rugged terrain, in a relatively short period of time. It was during the Korean War that the concept of "Host Nation Support" was applied to railroading in support of the Army. Railroading operations were conducted primarily by Korean nationals under U.S. military supervision.

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[1] The information used as a basis to prepare this appendix was gathered in interviews with MAJ(P) Terry Corson, current Commander of the 757th Transportation Battalion and SFC John Griffith, 1151st Transportation Company, on 2 March 1994, at the units' locations in Milwaukee, Wisconsin. Additionally, MAJ Ron Graebel, now assigned to the Operations Section, 336th Transportation Group, Fort Sheridan, Illinois, was interviewed on 3 March 1994 at Fort Sheridan. Interviews were conducted by Mr. Theodore S. Silva, ANDRULIS Research Corporation, as a part of a data gathering trip to ground transportation units in Wisconsin, Illinois, and Indiana, during the period 28 February to 8 March 1994. In addition to interviews, Majors Corson and Graebel provided notes, after-action reports, trip reports, and hand-written charts which were useful in understanding and preparing this appendix on Rail Operations.

In Vietnam there was little use of railroads because the rail infrastructure was not developed. Bridges and trestles which could have been easily destroyed were required if U.S. troops were to be supported by rail. No U.S. Army rail units were deployed to Vietnam and what little rail support was available to urban areas was controlled by the Vietnamese government and contracted to the U.S. for a specific task.

After the Vietnam conflict, railroading in the Army declined in importance and very few resources were allocated to it. The last railway battalion in the Active Component was deactivated in 1974, and a residual railway detachment was disbanded two years later, ending over 100 years of military railroading. Only Reserve Component rail units remained in the force structure, and as trained personnel began to dwindle from the Reserves, through attrition, those organizations were either reorganized or disbanding as well.

Status of Military Rail Assets

In the last two decades we have become more and more dependent upon host nation support to operate and maintain railroads in our contingency planning. Currently, there are only a handful of soldiers in the Total Army, predominantly in the USAR, who are qualified in the railway specialties. Because of the time that has passed since the inactivation of the last active rail units, there is virtually no one on active duty or in retired status eligible for recall who could be committed to railroading if needed.

Not only had the Army become short on railroad expertise as the Army moved into the 1980's, but because of the lack of active duty railroad organizations the Army's rail facilities and equipment had deteriorated from a lack of maintenance and use. Training programs were no longer being developed or updated within the TRADOC school system to reflect changing technology. Army rail operations prior to Operation DESERT STORM were reduced to a few small operations, consisting of a limited movement of rail cars monthly at Army installations throughout the country. As with other facilities, each installation commander was responsible for the maintenance of railroad track and track bed on his post, as well as the railroad cars and locomotives at the post. These functions competed for resources with all the other installation requirements, and generally were ignored. As MAJ (P) Terry Corson, the present commander of the 757th Transportation Battalion (Railway) puts it, "Army rail had become little more than a memory, symbolized by a flanged wheel and rail in the Transportation Corps insignia, and some relics of the past preserved in the Transportation Museum".

In the planning community within the Army in the early to mid-1980's there was some recognition that in the theaters of potential warfare, there could well be an inability to move supplies to the front lines fast enough to sustain the fighting troops. At that time the 757th was

a railway maintenance battalion with only maintenance capabilities. The battalion's soldiers repaired locomotives and rail cars, at both direct and general support levels. To accommodate the recognized need for some railway operations capability in the force structure, the 757th was reorganized in 1985 into a rail operating battalion with subordinate companies that could operate trains, maintain rail equipment, and maintain track. At this time also the 1205th Transportation Railway Services Unit of Middletown, Connecticut, a USAR organization of approximately 130 personnel, was organized to provide rail support to MTMC at the Military Ocean Terminal at Sunny Point, North Carolina (MOTSU).

Training programs were developed for members of these units in conjunction with civilian training institutions that also did training for the railroad industry. Purchase of some up-to-date locomotives and repair equipment allowed more timely mission accomplishment. Military installations from around the CONUS obtained assistance from 757th soldiers to repair, operate, and upgrade their rail equipment and track.

This, then was the state of military railroading when Operation DESERT SHIELD began in August 1990. The units which were in the force structure and became involved in Operations DESERT SHIELD and DESERT STORM, albeit employed in CONUS, are shown in Figure 1, with their authorized strength, and mission orientation.

Figure 1.

U.S. Army Reserve Railway Units

Unit	Location	Strength	Mission
HQ, 757th Transportation Battalion (Railway)	W. Allis, WI	113	Operational planning, maintenance of commercial equipment, C2 of units.
226th Transportation Company	Granite City, IL	206	Track maintenance, bridge and structure repair along the line.
1150th Transportation Company	W. Allis, WI	83	Repair of locomotives and railroad cars.
1152nd Transportation Company	W. Allis, WI	83	
1151st Transportation Company	W, Allis, WI	244	Operates locomotives and entire trains. Provides yard crews in railyards and sidings to move cars for loading/unloading.
1205th Transportation Railway Services Unit	Middletown, CT	132	Provide train crew members and track maintenance at Military Ocean Terminal, Sunny Point in support of MTMC.

Use of U.S. Military Rail Assets
During Operations DESERT SHIELD and DESERT STORM

MAJ (P) Terry Corson, currently the Commander of the 757th Transportation Battalion (Railway) was the Chief Train Dispatcher of the battalion during the period of the Gulf War. That function would be equivalent to an S3 (operations officer) in a traditional battalion

organization. He is a professional in the railroading industry, having worked in the field for more than twenty years. He is currently the Mechanical Superintendent of the Wisconsin Central Railroad.

In his military assignment, MAJ Corson was responsible for selecting the personnel and putting together the teams which were activated by derivative UIC for duty at several locations in CONUS where rail use intensified as the Gulf War heated up. He also visited most of the sites where 757th soldiers were committed. Because of his Reserve assignments, and his civilian professional association with railroading, the Army's rail points of contact came to depend upon him for troubleshooting missions and advice.

There is no central proponent for railroading in the Army. Army-wide, the management of locomotives and rolling stock was an AMC responsibility and it resided in the Troop Support Command (TROSCOM) in St. Louis. (TROSCOM and the Aviation Support Command (AVSCOM) are now combined into one command called Aviation and Troop Support Command (ATSCOM).) That command also used individuals such as MAJ Corson, to check on troubles or expedite problem solving since there are so few persons in the military with the requisite knowledge in the field. MAJ Corson acted as their eyes and ears at each location where there was rail activity during Operations DESERT SHIELD and DESERT STORM. TROSCOM accepted the responsibility to purchase equipment for MTMC use at its port facilities, particularly track repair supplies and parts. But TROSCOM (or AMC) had no command responsibility for railroading as a functional area and could not direct upgrades or resource commitments to FORSCOM installations, MTMC ports, or AMC Depots or Ammunition Plants. As a result tracks and beds were given little priority through the years and had fallen into disrepair, as had locomotives and rail cars due to deferred maintenance.

In years past, the 425th Transportation Brigade exercised Army Reserve functional command over the 757th Transportation Battalion (Railway), and that gave railroading a general officer champion within the USAR. But that brigade has restructured and has another mission. The 757th is now a part of a transportation group under an ARCOM -- not a situation where an appreciation for rail operations, and a commitment of resources to rail training can be expected.

During Operations DESERT SHIELD and DESERT STORM, personnel from the 757th were used in the numbers indicated, and in volunteer or mobilized status, at the locations shown in Figure 2.

Figure 2.

757th Transportation Battalion (Railway)
Commitment to Operations DESERT SHIELD and DESERT STORM

Dates	Personnel	Status	Location	Mission
22 Aug - 6 Dec 90	4	Volunteer	Ft Hood, TX	Rail load-out of mobilizing unit equipment.
23 Nov - 31 Dec 90	11	Volunteer	Ft McCoy, WI	Rail load-out of mobilizing unit equipment.
29 Nov - 20 Dec 90	1	Volunteer	Ft McCoy, WI	Locomotive maintenance.
3 Dec - 31 Dec 90	1	Volunteer	Ft McCoy, WI	Train civilian operators.
7 Dec 90 - 4 Feb 91	3	Volunteer	Ft Hood, TX	Rail load-out of mobilizing unit equipment and ARNG brigades to NTC.
14 Dec 90 - 11 Feb 91	8	Volunteer	McAlester Army Ammunition Plant, OK	Support rail movement of outgoing ammunition.
17 Dec 90 - 24 Feb 91	10	Volunteer	MOTSU, NC	Support to rail operations on docks at terminal.
2 Jan - 4 Jan 91	2	Volunteer	Ft McCoy, WI	Maintain locomotive.
27 Jan - 27 Mar 91	22	Volunteer	McAlester, OK	Repair track and track bed.
18 Feb - 18 Mar 91	5	Volunteer	McAlester, OK	Mess personnel to feed unit railroad personnel.
20 Feb - 27 Mar 91	9	Volunteer	Ft Hood, TX	Begin receiving returning materiel by rail. Load-out units to NTC by rail.
14 Feb - 14 Jun 91	39	Mobilized	MOTSU, NC	Support to rail operations on docks and at terminal.
14 Feb - Jun 91	26	Mobilized	McAlester, OK	Support rail operations. Maintain track.
14 Feb - Jun 91	10	Mobilized	McAlester, OK	Maintain rail equipment--locomotive and cars.

When elements of the battalion were mobilized on 14 February 1991, the strength was about 500 personnel, of 729 authorized. The unit had a SWA CAPSTONE trace, but ARCENT felt that host nation support in Saudi Arabia could handle railroad operations in the Gulf War. Much of the track and roadbed, as well as the train equipment itself had been neglected in the CONUS for years, and the 757th was needed to do upgrades on that. The battalion had done AT at McAlester Oklahoma Army Ammunition Plant so it was known to the people there. The battalion also had participated routinely in live missions at Forts McCoy and Hood, so they were well known there as well. It was therefore natural for them to be requested by those installations--and they were.

At McAlester, the track was not in good enough shape to hold the train traffic that was increasing in a rapid surge to move ammunition from the plant to the theater of operations. There were also out-of-service rail cars and a locomotive there that needed repair. At any one time, as can be seen in Figure 2., there were about 40 members of the 757th working on those problems and helping the civilian employees keep the rail operations in full swing.

The 1205th Transportation Railway Services Unit, a USAR unit headquartered at Middletown, Connecticut, was activated on 4 January 1991 to conduct rail operations and repair track and track bed at the Military Ocean Terminal, Sunny Point, North Carolina (MOTSU). MOTSU was designed for the quick and efficient movement of ammunition and other hazardous cargo from trucks and rail to waiting ships. MOTSU was to become the largest ammunition transshipment facility in the nation, as supplies moved to the Gulf. The 1205th had been earmarked for support to MTMC at MOTSU and had performed annual training there for years. The 1205th is a TDA unit organized specifically to maintain the tracks, and operate trains to and from the port to the sidings where link-up with main line commercial trains can be effected. Most of the 121 soldiers who were activated from the 1205th had become familiar with the wharves, rail mounted bridge cranes, holding yards, and nearly 100 miles of track at the terminal.

The 1205th was faced with an extremely heavy workload. Working fifteen hours per day, seven days a week was not uncommon for the first month of duty. The task was simply too great and was going to be too protracted for a unit of that size to carry out effectively. Neglected sections of track and long-neglected facilities and operating stock had taken a toll and some serious accidents and derailments were in the offing if repairs weren't made and the troops of the 1205th given some relief. Then some help arrived from the 757th Transportation Battalion.

Captain Ron Gabrael was the OIC of a group of about 40 soldiers from the 757th that was mobilized and sent to MOTSU to provide needed relief. The 1205th and 757th personnel operated the locomotives and rail cars the 18 miles from the docks to the main line where they

linked up with commercial rail carriers. Then they brought the loaded cars to a classification yard at the terminal where the Transportation Terminal Unit (TTU) decided what would be loaded on what ship, and when to bring that material on its rail cars to the wharves. The rest would be earmarked for a Holding Yard.

Since the track bed was very poor at MOTSU, because of inadequate maintenance over many years, this huge surge of supplies and equipment coming in for shipment to the Gulf put a huge strain on it. There had been no workout like this since Vietnam. In fact, all the track could not be used. Usage of wharves and sidings were also limited because of deterioration.

There were other problems In the Holding Yard, there were large ditches at the base of the track bed. When it rained these filled with water and they didn't drain very rapidly. Thus, there was a lot of standing water in them much of the time. There were also alligators in marshy areas around the Holding area. The alligators would move into the ditches adjacent to the track bed whenever there was water in them. At such times the troops learned very quickly not to get off the locomotive or the cars because the alligators would come after them.

Costs increase rapidly when working with railroad equipment and when the Army has little control over much of the labor. Stevedores wanted all the rail cars spotted by 0800 each day so they could start their morning schedule. The 757th and 1205th troops therefore had to place about 20 rail cars by 0800. If they weren't on time and lined up with the correct ships's hatches the Army had to pay a penalty to the company furnishing the stevedores. This was monitored very closely. (That amount each stevedore gang was scheduled to work on each hour was important. Stevedores don't work in the rain, without extra pay. Yet ammunition had to go to the Gulf. So on rainy days, and there were plenty of them, the stevedores got extra money for loading ammunition. This cost the government greatly.)

At McAlester the ammunition storage areas could be reached only by rail. Trucks could not get to them. During the return of ammunition from the Gulf, and later during the retrograde from Europe, ammunition had to be stored in every bunker at the plant. There were many trains in and out. There was a requirement for much track and bed repair to accommodate those trains getting to the bunker areas. That's the main reason 757th personnel were required there for so long after the Gulf War was over.

There was a variety of missions at Fort McCoy for the 757th personnel who had been requested to assist the post in its rail operations. One task was to train newly hired civilian personnel, hired by the installation Director of Logistics, in locomotive operations. Another was to assist in round-the-clock rail operations from the post to the point where they would meet the commercial rail cars at the main line. SFC John Griffith, an AGR Road Foreman of Engines in the 1151st Transportation Company, a train operations company, and the NCOIC of the 757th

soldiers at Fort McCoy remembers that they would push the commercial rail cars with their locomotive kept at Fort McCoy onto various sidings at the post for loading and unloading (each siding held five or six cars), then push them back out to the main line to meet a commercial train which would take them to the port. SFC Griffith put this locomotive into operation in October 1990.

The 757th kept soldiers at Fort McCoy into January 1991 helping to run the trains because there was such a huge surge of unit equipment being shipped out of there for seaports and on to Saudi Arabia. A complicating factor was the harsh winter that year. Some days the visibility was three or four feet only because the snow was falling so heavily. Snow clearing from the track, sidings, loading platforms, and crossings took much time and contributed to potential delays. Many days the 757th soldiers and the civilian work force operated around the clock. It was SFC Griffith's job to keep things moving so that there were no penalty costs--a nerve wracking mission for an NCO with no senior people running interference for him. The Director of Logistics at Fort McCoy, Mr. Klein, was great to work for, however, and very supportive of Griffith's operation.

Problems

Operations DESERT SHIELD and DESERT STORM served to highlight the several problems involving railroad operations in the Army.

a. One major problem is the poor condition of track, track bed, and railway equipment at military installations, including mobilization stations, depots, ammunition plants, and ports. Routine peacetime use of military rail is not heavy, so this had no visibility at the higher levels. But, when a mobilization occurs, the required surge cannot be accommodated. Then, at that time, there are no resources or time to do the maintenance of track and equipment or the training of personnel. The surge is on and the railways are not up and running. This was true particularly at MOTSU. The average commander on an installation is not running around on the back end of his post checking the condition of rail sidings, rolling stock, and loading platforms.

b. A second major problem involves a serious lack of knowledge in the Army of rail operations. Only an overview of historical reading is done in the TC Officer Advance Course. There are no rail units in the Active Component, so AC officers or NCOs rarely do rail planning or operations. A GAO Study on Rail Operations at Installations, done after Operation DESERT STORM confirms this. Consequently, it is omitted from all the resource decision making. No functional area competes favorably for resources without a credible proponent or users who strongly defend it. A good example of this is the ammunition plant at

Hawthorne, California. That plant never had any augmentation before by a supporting USAR element and they had a stressful time during Operation DESERT SHIELD. They heard about the help given to McAlester and now want a regular support package from the 757th during AT to provide assistance during special production periods. Further, when they needed help in the past, they couldn't hire from civilian railroading because there was no source nearby.

c. Finally, the troops in rail units have a difficult time maintaining their MOS qualification, because their training during IDT and AT is not comprehensive enough to attain or retain MOSQ. For example, in the 1205th Transportation Railway Services Unit early in the support mission at MOTSU, it was necessary to have special training for the MOS 88V train crew personnel; an IMA officer taught special classes on Maintenance of Way (track and track bed); a contractor developed the timetable for use in the MOTSU rail yards at the terminal; a special two week course was set up by a civilian contractor to provide 88T MOS qualifying training; a retired civilian railroader was brought in as a special consultant to provide an analysis of what equipment was needed to operate the rail system at MOTSU in accordance with the mission's requirements; and a Sperry Rail Detector was obtained to inspect all the track at the terminal to prioritize repairs. In short, an intensive effort was required to rectify long-neglected problems of a lack of trained personnel in the unit and physical plant deficiencies at the terminal.

Outlook

In 1991, efforts were started to reorganize the companies of the 757th Transportation Battalion from specialized single function units into multi-functional units, each capable of operating trains, repairing rolling stock, and maintaining track and track bed. This reorganization, which will give the battalion much more flexibility to support operations in CONUS as well as a theater of operations, is expected to become effective in FY1995. The 757th is the Army's only railway unit capable of commitment worldwide. The 1205th continues its mission orientation toward MTMC at Sunny Point.

The Gulf War, and the many requirements placed on military rail operations at mobilization staticns like Fort Hood and Fort McCoy, at the MOTSU terminal and at depots and ammunition plants, served to highlight the state of decline in military railroading. Hopefully, the superb contributions of the soldiers in this field to overcome much adversity and get the rail mission accomplished, has served as a "wake-up call" that we neglect this area at our peril for future success in moving large amounts of materiel and equipment.

UNITED STATES ARMY RESERVE
in
OPERATION DESERT STORM

GROUND TRANSPORTATION OPERATIONS

APPENDIX B

Task Organization of Transportation Corps Units in Southwest Asia

This appendix presents the task organization of all Transportation units deployed to Southwest Asia as of early February 1991, after the start of the Air War but before the start of the Ground War. There were numerous changes of subordination of transportation companies and battalions during the evolution of the theater support structure and even during the preparation for combat phase. The time period selected in this particular task organization shows how the full weight of transportation assets were organized to create maximum capability in support of the maneuver scheme for ARCENT.

This task organization was developed by comparing three sources of information: a list of all TC units of all components deployed to the theater from DAMO-OP; a task organization provided by Lieutenant Colonel Danny East, who was a Transportation Operations Officer at FORSCOM HQs during the war; task organization charts provided by Lieutenant Colonel Larry Dawson, 143rd Transportation Command, and various unit after-action reports and briefings. These sources do not agree in all details, and the task organization in this appendix has some errors. For example, the FORSCOM task organization does not include the 4th Transportation Battalion of the 2nd COSCOM and its subordinate companies, but the unit is shown on organization charts provided by Lieutenant Colonel Dawson. The organization and listing of movement control detachments is also suspect, and a few units appear that are not on the task organizations provided. The home station for several AC units is not known.

The actual task organization is more complicated than that depicted, because some of the detachments were not utilized for their intended purpose or were broken up to provide individuals to form provisional headquarters. In particular, it is not clear that the contract supervision detachments listed under the 7th Transportation Group actually supervised the cargo documentation teams shown. The subordination of battalions and groups is generally correct, but shows the 1103rd Transportation Battalion as OPCON to the 32nd Transportation Group at this time (during the movement to battle), even though the 1103rd was assigned to the 7th Group.

XVIII Airborne Corps

1st Corps Support Command

330th TC Battalion, Movement Control COSCOM, AC, Fort Bragg

Highway Traffic Headquarters

264th TC Detachment, Movement Control LA, AC, Fort Bragg, NC
592th TC Detachment, Movement Control LC, AC
10th TC Detachment, Movement Control LH, ARNG, Albany, NY
228th TC Detachment, Movement Control LH, ARNG, Allentown, PA
261st TC Detachment, Movement Control LH, AC, Fort Bragg, NC
328th TC Detachment, Movement Control LH, ARNG, Pemberton, NJ
704th TC Detachment, Movement Control LH, ARNG, Camp Curtis, MA,
747th TC Detachment, Movement Control LH, ARNG, Rapid City, SD
838th TC Detachment, Movement Control LH, ARNG, Indianapolis, IN

193rd TC Detachment, Movement Control LD, ARNG, Laurel, MS

171st TC Detachment, Movement Control LC, AC, Fort Irwin, CA
51st TC Detachment, Movement Control LC, AC, Hunter Army Airfield

380th TC Detachment, Movement Control LB, AC, Fort Bragg, NC

304th TC Detachment, Movement Control LC, USAR, Des Moines, IA
146th TC Detachment, Movement Control LF, USAR, Orlando, FL
563rd TC Detachment, Movement Control LH, AC, Fort Hood, TX

1009th TC Detachment, Movement Control LD, ARNG, Lansing, MI

571st TC Detachment, Movement Control LC, AC, Fort Hood, TX
224th TC Detachment, Movement Control LH, ARNG, Los Alamitos, CA

1659th TC Detachment, Movement Control LD, ARNG, Troy, AL

29th TC Detachment, Movement Control LB, USAR, Fort Bragg, NC
593rd TC Detachment, Movement Control LH, AC, Fort Riley, KS

43rd Corps Support Group

544th Maintenance Battalion

915th TC Company, Medium Truck Cargo, AR, Council Bluffs, IA
418th TC Company, Medium Truck 5,000 gal, AC

169th Maintenance Battalion
1544th TC Company, Light Medium Truck, ARNG, Paris, IL
644th TC Company, Heavy Truck, USAR, Beaumont, TX

46th Corps Support Group

530th Supply & Services Battalion
603rd TC Company, Light Medium Truck, AC, Fort Polk, LA
533rd TC Company, Medium Truck Cargo, AC, Fort Benning, GA
361st TC Detachment, Trailer Transfer, AC, Fort Benning, GA

189th Maintenance Battalion
497th TC Company, Light Truck 5T, AC, Fort Lewis, WA
546th TC Company, Light Medium Truck, AC, Fort Bragg, NC

101st Corps Support Group

29th Transportation Battalion, AC, Fort Campbell, KY
372nd TC Company, Light Medium Truck, AC, Fort Campbell, Ky
494th TC Company, Light Medium Truck, AC, Fort Campbell, KY
594th TC Company, Medium Truck Cargo, AC, Fort Campbell, KY
372nd TC Company, Cargo Transfer, AC

561st Supply & Service Battalion
2668th TC Company, Light Medium Truck, ARNG, Fresno, CA
719th TC Company, Medium Truck Cargo, ARNG, New York, NY
541st TC Company, Medium Truck 5,000 gal, AC, Fort Campbell, KY

553rd Supply & Service Battalion
547th TC Company, Light Medium Truck, ARNG, Washington, DC
628th TC Company, Light Medium Truck, AC, Fort Hood, TX
96th TC Company, Heavy Truck, AC

171st Corps Support Group

541st Maintenance Battalion
991st TC Company, Heavy Truck, USAR, Salisbury, NC

548th Supply & Service Battalion
- 57th TC Company, Light Medium Truck, AC, Fort Drum, NY
- 1083rd TC Company, Heavy Truck, ARNG, Jonesville, LA
- 22nd TC Detachment, Trailer Transfer, AC, Fort Lewis, WA

260th POL Battalion
- 84th TC Company, Light Medium Truck, AC, Hunter Army Airfield
- 416th TC Company, Medium Truck Petroleum, AC, Hunter Army Airfield

507th Corps Support Group

540th POL Battalion
- 1454th TC Company, Medium Truck Cargo, ARNG, Concord, NC
- 1450th TC Company, Medium Truck Petroleum, ARNG, Jefferson, NC
- 623rd TC Company, Medium Truck 5,000 gal, USAR, Fort Totten, NY
- 222nd TC Company, Medium Truck 5,000 gal, ARNG, Tucson, AZ

70th Ordnance Battalion
- 62nd TC Company, Medium Truck Cargo, AC, Fort Bliss, TX
- 233rd TC Company, Heavy Truck, AC, Fort Bliss, TX

7th Motor Transport Battalion, AC, Fort Bragg, NC
- 126th TC Company, Medium Truck Cargo, AC, Fort Bragg, NC
- 129th TC Company, Heavy Truck, USAR, Osage City, KS
- 403rd TC Company, Cargo Transfer, AC, Fort Bragg, NC
- 483rd TC Detachment, Trailer Transfer, AC, Fort Bragg, NC

419th Water Supply Battalion
- 104th TC Company, Medium Truck Cargo, AC, Fort Devens, MA

Supply & Transportation Battalion
- 10th TC Company, Medium Truck Cargo, AC, Fort Jackson, SC

VII Corps

2nd Corps Support Command

229th TC Battalion, Movement Control, AC, Nellingen, GE

94th TC Detachment, Movement Control LC, USAR, Fort Bragg, NC
- 266th TC Detachment, Movement Control LA, AC, Fort Riley, KS
- 77th TC Detachment, Movement Control LB, USAR, Fort McCoy, WI
- 275th TC Detachment, Movement Control LB, AC, Fort Hood, TX
- 456th TC Detachment, Movement Control LB, USAR, Manhattan, KS
- 839th TC Detachment, Movement Control LB, USAR, Jacksonville, FL
- 677th TC Detachment, Movement Control LC, USAR, Fort Sheridan, IL

241st TC Detachment, Movement Control LD, ARNG, Tacoma, WA
- 32nd TC Detachment, Movement Control LA, USAR, Fort McCoy, WI
- 263rd TC Detachment, Movement Control LA, AC, Fort Hood, TX
- 265th TC Detachment, Movement Control LA, AC, Fort Lewis, WA
- 398th TC Detachment, Movement Control LB, AC, Fort Riley, KS
- 216th TC Detachment, Movement Control LF, USAR, Jacksonville, FL

300th TC Detachment, Movement Control LF, USAR, Tacoma, WA
- 599th TC Detachment, Movement Control LB, USAR, Jacksonville, FL
- 341st TC Detachment, Movement Control LD, USAR, San Antonio, TX

7th Corps Support Group

213th Supply & Service Battalion
- 501st TC Company, Medium Truck Cargo, AC, Kaiserslautern GE
- 257th TC Company, Heavy Truck, USAR, Las Vegas, NV
- 319th TC Company, Medium Truck 5,000 gal, USAR, Augusta, GA

71st Maintenance Battlalion
- 1742nd TC Company, Medium Truck Cargo, ARNG, Watertown, SD

16th Corps Support Group

4th Transportation Battalion, AC, Ludwigsburg, GE
- 15th TC Company, Light Medium Truck, AC, Nellingen, GE
- 396th TC Company, Light Medium Truck, AC, Ludwigsburg, GE
- 590th TC Company, Light Medium Truck, AC, Mannheim, GE
- 32nd TC Company, Medium Truck Cargo, AC, Ludwigsburg, GE
- 11th TC Company, Heavy Truck, AC, Heilbronn, GE
- 377th TC Company, Heavy Truck, AC, Mannheim, GE
- 515th TC Company, Medium Truck Petroleum, AC, Augsburg, GE

286th Supply & Service Battalion
- 250th TC Company, Medium Truck Cargo, USAR, El Monte, CA

300th Supply & Service Battalion
- 495th TC Company, Medium Truck 5,000 gal, USAR, Lakeland, FL
- 656th TC Company, Medium Truck 5,000 gal, USAR, Dayton, OH
- 1032nd TC Company, Medium Truck 5,000 gal, ARNG, Big Stone, VA
- 2222nd TC Company, Medium Truck Petroleum, ARNG, Douglas, AZ

30th Corps Support Group

6th Transportation Battalion, AC, Fort Eustis, VA
- 1168th TC Company, Light Medium Truck, ARNG, Red Oak, IA
- 121st TC Company, Medium Truck Cargo, ARNG, Lebanon, PA
- 1644th TC Company, Medium Truck Cargo, ARNG, Riverside, IL
- 212th TC Company, Heavy Truck, USAR, Chattanooga, TN
- 319th TC Company, Medium Truck 5,000 gal, USAR, Augusta, GA

1st Maintenance Battalion
- 744th TC Company, Medium Truck Cargo, ARNG, Claremont, NH

159th Corps Support Group

87th Maintenance Battalion
- 1229th TC Company, Medium Truck Cargo, ARNG, Crisfield, MD
- 419th TC Company, Medium Truck 5,000 gal, USAR, Salt Lake City,UT

286th Supply & Service Battalion

1087th TC Company, Light Medium Truck, ARNG, Vidalia, LA
1052nd TC Company, Medium Truck Cargo, ARNG, Kingstree, SC
1158th TC Company, Heavy Truck, ARNG, Monroe, WI
1174th TC Company, Medium Truck 5,000 gal, ARNG, Dresden, TN

Echelons Above Corps

22nd Support Command

226th Area Support Group

394th Water Supply Battalion
1086th TC Company, Medium Truck Cargo, ARNG, Jena, LA

731st Maintenance Battalion
2220th TC Company, Light Medium Truck, ARNG, Phoenix, AZ

Dhahran Area Support Group

Dhahran Area Support Battalion
365th TC Company, Light Truck 5T, AC, Fort McClellan, AL
1113th TC Company, Medium Truck Cargo, ARNG, Sacramento, CA

475th Quartermaster POL Group

240th POL Battalion
281st TC Company, Medium Truck 5,000 gal, USAR, Las Cruces, NM
296th TC Company, Medium Truck 5,000 gal, USAR, Brookhaven, MS
298th TC Company, Medium Truck 5,000 gal, USAR, Franklin, PA
348th TC Company, Medium Truck 5,000 gal, USAR, Phoenix, AZ

383rd POL Battalion
360th TC Company, Medium Truck Petroleum, AC
724th TC Company, Medium Truck 5,000 gal, USAR, Peoria, IL
941st TC Company, Medium Truck 5,000 gal, USAR, Charleston, SC
1148th TC Company, Medium Truck Petroleum, ARNG, Augusta, GA

387th POL Battalion
182nd TC Company, Medium Truck Petroleum, USAR, Traverse City,MI
705th TC Company, Medium Truck Petroleum, USAR, Dayton, OH
781st TC Company, Medium Truck Petroleum, ARNG, Fort Deposit, AL
786th TC Company, Medium Truck Petroleum, ARNG, Lucedale, MS
920th TC Company, Medium Truck 5,000 gal, USAR, Cave, NJ

370th Water Supply Battalion
- 172nd TC Company, Medium Truck Cargo, USAR, Omaha, NE
- 892nd TC Company, Medium Truck Cargo, USAR, Belleville, IL
- 630th TC Company, Medium Truck Cargo, USAR, Washington, PA

318th Movement Control Agency, USAR, Jamaica, NY

93rd Movement Control Battalion, Provisional
- 81st TC Detachment, Movement Control LC, USAR, Troy, AL
- 57th TC Detachment, Movement Control LD, ARNG, Brookings, SD
- 200th TC Detachment, Movement Control LD, USAR, Baltimore, MD
- 206th TC Detachment, Movement Control LF, ARNG, Portland, OR
- 121st TC Detachment, Movement Control LH, ARNG, Raleigh, NC
- 256th TC Detachment, Movement Control LC, AC
- 259th TC Detachment, Movement Control LD, AC
- 339th TC Detachment, Movement Control LB, USAR, Fort Sheridan, IL
- 340th TC Detachment, Movement Control LC, USAR, Fort McCoy, WI
- 391st TC Detachment, Movement Control LB, AC
- 382nd TC Detachment, Movement Control LH, AC
- 458th TC Detachment, Movement Control LF, USAR, Scott AFB, IL
- 541st TC Detachment, Movement Control LB, USAR, San Antonio, TX
- 586th TC Detachment, Movement Control LC, AC
- 588th, TC Detachment, Movement Control LC, AC, Fort Bragg, NC
- 1104th TC Detachment, Movement Control LH, ARNG, Austin, TX
- 1122nd TC Detachment, Movement Control LH, ARNG, Madison, WI
- 1157th TC Detachment, Movement Control LH, ARNG, Camp George, CO
- 1158th TC Detachment, Movement Control LH, ARNG, Camp George, CO
- 1167th TC Detachment, Movement Control LH, ARNG, Troy, AL
- 1444th TC Detachment, Movement Control LC, ARNG, Tacoma, WA
- 3620th TC Detachment, Movement Control LD, ARNG, Augusta, ME

49th Movement Control Battalion, AC, Fort Hood, TX
- 18th TC Detachment, Movement Control LB, AC
- 142th TC Detachment, Movement Control LF, USAR, Jamaica, NY
- 329th TC Detachment, Movement Control LF, AC, Fort Bragg, NC
- 343rd TC Detachment, Movement Control ??, USAR, Fort Snelling, MN
- 385th TC Detachment, Movement Control LF, USAR, Fort Bragg, NC
- 531st TC Detachment, Movement Control LC, USAR, Manhattan, KS
- 592nd TC Detachment, Movement Control LC, AC, Fort Bragg, NC

7th Transportation Terminal Group, AC, Fort Eustis, VA

140th TC Detachment, Contract Supervision, AC
- 83rd TC Detachment, Cargo Documentation, AC
- 139th TC Detachment, Cargo Documentation, USAR, Fort Totten, NY
- 396th TC Detachment, Cargo Documentation, AC

160th TC Detachment Contract Supervision, AC, Fort Eustis, VA
- 145th TC Detachment, Cargo Documentation, USAR, Hampton, VA
- 157th TC Detachment, Cargo Documentation, AC, Fort Eustis, VA
- 166th TC Detachment, Cargo Documentation, AC
- 394th TC Detachment, Cargo Documentation, AC

355th TC Detachment, Contract Supervision, AC, Fort Lewis, WA
- 91st TC Detachment, Cargo Documentation, USAR, Hampton, VA
- 172nd TC Detachment, Cargo Documentation, AC
- 343rd TC Detachment, Cargo Documentation, USAR, Fort Snelling, MN
- 564th TC Detachment, Cargo Documentation, AC

390th TC Detachment, Contract Supervision, AC, Fort Campbell, KY
- 545th TC Detachment, Cargo Documentation, AC
- 585th TC Detachment, Cargo Documentation, AC
- 596th TC Detachment, Cargo Documentation, USAR, Charleston, SC

417th TC Detachment Contract Supervision, USAR, Baltimore, MD
- 202nd TC Detachment, Cargo Documentation, USAR, Baltimore, MD
- 628th TC Detachment, Cargo Documentation, AC

10th Terminal Battalion, AC, Fort Eustis, VA
- 155th TC Company, Terminal Service, AC, Fort Eustis, VA
- 368th TC Company, Terminal Service, AC, Fort Story, VA
- 685th TC Company, Terminal Transfer, USAR, Hobart, IN
- 706th TC Company, Terminal Transfer, USAR, Mansfield, OH
- 97th TC Company, Heavy Boat, AC, Fort Eustis, VA
- 703rd TC Company, Watercraft, Provisional
  - 329th TC Company (-), Heavy Boat, AC, Fort Eustis, VA
  - 73rd TC Company (-), Floating Craft, AC, Fort Eustis, VA
  - 558th TC Company (-), Floating Craft Maint, AC, Fort Eustis
  - 1098th TC Company (-), Medium Boat, AC, Fort Eustis, VA
- 335th TC Detachment, Logistics Support VSL, AC, Fort Eustis, VA
- 1099th TC Detachment, Logistics Support VSL, AC, Fort Eustis, VA
- 137th TC Detachment, Freight Consol/Distr, ARNG, Danville, KY
- 276th TC Detachment, Cargo Documentation, AC, Fort Story, VA
- 511th EN Detachment, Diving, AC, Fort Eustis, VA
- 86th EN Detachment, Diving, AC, Fort Eustis, VA
- 74th EN Detachment, Diving, AC, Fort Eustis, VA
- 26th QM Detachment, ROWPU Water Purification, AC, Fort Eustis, VA
- 30th QM Detachment, ROWPU Water Purification, AC, Fort Eustis, VA

24th Terminal Battalion, AC, Fort Eustis, VA
- 119th TC Company, Terminal Service, AC, Fort Eustis, VA
- 264th TC Company, Terminal Service, AC, Fort Eustis, VA
- 567th TC Company, Terminal Service, AC, Fort Eustis, VA
- 390th TC Company, Terminal Transfer, USAR, Ceiba, PR
- 650th TC Company, Terminal Transfer, USAR, Wilmington, NC
- 551st TC Company, Cargo Transfer, AC, Fort Eustis, VA
- 1090th TC Detachment, Freight Con/Distr, ARNG, Camp Beauregard,LA
- 159th TC Detachment, Heavy Crane, AC, Fort Eustis, VA
- 358th TC Detachment, Cargo Documentation, AC, Fort Eustis, VA
- 491st TC Detachment, Cargo Documentation, AC, Fort Eustis, VA

68th Transportation Battalion, AC, Fort Carson
- 253rd TC Company, Light Medium Truck, ARNG, Cape May, NJ
- 1058th TC Company, Light Medium Truck, ARNG, Hingham, MA
- 513th TC Company, Medium Truck Cargo, AC, Fort Lewis, WA
- 890th TC Company, Medium Truck Cargo, USAR, Green Bay, WI
- 1128th TC Company, Medium Truck Cargo, ARNG, Clayton, AL
- 1133rd TC Company, Medium Truck Cargo, ARNG, Mason City, IA
- 90th TC Detachment, Trailer Transfer, AC, Fort Eustis, VA
- 601st TC Detachment, Trailer Transfer, AR, Rio Grande, TX

180th Transportation Battalion, AC, Fort Hood, TX
- 1244th TC Company, Light Medium Truck, ARNG, Cairo, IL
- 24th TC Company, Medium Truck Cargo, AC, Fort Riley, KS
- 386th TC Company, Medium Truck Cargo, USAR, Natchez, MS
- 639th TC Company, Medium Truck Cargo, USAR, Kingsport, TN
- 762nd TC Company, Medium Truck Cargo, USAR, Canton, OH
- 1033rd TC Company, Medium Truck Cargo, ARNG, Gate City, VA
- 406th TC Detachment, Trailer Transfer, AC, Fort Hood, TX

419th Transportation Battalion, USAR, Peoria, IL
- 1461st TC Company, Light Truck, ARNG, Jackson, MI
- 253rd TC Company, Light Medium Truck, ARNG, Cape May, NJ
- 1122nd TC Company, Light Medium Truck, ARNG, Monticello, AR
- 131st TC Company, Medium Truck Cargo, ARNG, Williamstown, PA
- 180st TC Company, Medium Truck Cargo, USAR, Grand Rapids, MI
- 619th TC Company, Medium Truck Cargo, USAR, Auburn, ME
- 639th TC Company, Medium Truck Cargo, USAR, Kingsport, TN
- 544th TC Detachment, Trailer Transfer, AC, Fort Eustis, VA

702nd Transportation Battalion, AC, Provisional
- 1404th TC Company, Light Medium Truck, ARNG, Show Low, AZ

4th Battalion, 16th Infantry Regiment, AC, Germany

3rd Battalion, 2nd Air Defense Regiment (Chapparal), AC, Fort Lewis, WA
- Battery A
- Battery B
- Battery C
- 73rd Engineer Company

32nd Transportation Composite Group, USAR, Tampa, FL

185th Transportation Battalion, ARNG, Fresno, CA
424th TC Company, Medium Truck Cargo, USAR, Galax, VA
542nd TC Company, Medium Truck Cargo, USAR, Kingsbury, IN
1486th TC Company, Medium Truck Cargo, ARNG, Ashland, OH
1487th TC Company, Medium Truck Cargo, ARNG, Eaton, OH

369th Transportation Battalion, ARNG, New York, NY
217th TC Company, Heavy Truck, USAR, San Antonio, TX
287th TC Company, Heavy Truck, USAR, Livingston, AL
660th TC Company, Heavy Truck, USAR, Cadiz, OH
720th TC Company, Heavy Truck, ARNG, Las Vegas, NV
1569th TC Company, Light Medium Truck, ARNG, New York, NY
2123rd TC Company, Heavy Truck, ARNG, Bowling Green, KY

766th Transportation Battalion, USAR, Evansville, IN
131st TC Company, Medium Truck Cargo, ARNG, WIlliamstown, PA
227th TC Company, Medium Truck Cargo, USAR, Albemarle, NC
740th TC Company, Medium Truck Cargo, ARNG, Milbank, SD
1221st TC Company, Medium Truck Cargo, ARNG, Dexter, MO
762nd TC Company, Medium Truck Cargo, USAR, Canton, OH
846th TC Company, Medium Truck Cargo, USAR, Salisbury, NC
890th TC Company, Medium Truck Cargo, USAR, Green Bay, WI
189th TC Detachment, Trailer Transfer, USAR, Council Bluffs, IA

1103rd Transportation Battalion, ARNG, Eufaula[1]
471st TC Company, Light Truck 5T, AC, Fort Sill, OK
1438th TC Company, Light Truck, ARNG, Camp Atterbury, IN
1157th TC Company, Light Medium Truck, ARNG, Oshkosh, WI
1245th TC Company, Light Medium Truck, ARNG, Tishomongo, OK
1345th TC Company, Light Medium Truck, ARNG, Ardmore, OK
1485th TC Company, Light Medium Truck, ARNG, Mansfield, OH

[1] Entire battalion deployed without equipment and operated commercial heavy equipment transporters.

Egyptian Tank Transport Battalion

Separate Companies

Saudi Truck Company
KKMC APOD Bus Company
KKMC APOD Truck Company
870th TC Company, Cargo Transfer, AC, Fort Eustis, VA

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