# THE IMPACTS OF MOVEMENT CONTROL IN WORLD WAR TWO MEDITERRANEAN AND WESTERN EUROPEAN THEATERS OF OPERATION

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In World War Two (WWII) European Theater of Operations, Movement control operations and structure began to formalize, and roles and responsibilities became more delineated and defined. For several decades post WWII, movement control experienced a high level of growth to the point of have a one-star movement control command. At the height of movement control growth, the Army sought to make way for growth in new units and technologies, while transforming for counter insurgency warfare. Through this, movement control structure frequently became the target as a billpayer for the growth of other programs and units. As the Army transitions and returns to preparing for large scale combat operations, it must also learn from history to understand the future fight. WWII was the largest scale in which combat operations were ever executed and serves as the best example to follow in preparation for the future. Movement control in WWII Europe and Mediterranean provides a framework and guide to follow to understand the potential challenges and solutions for movement control in future operations.

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ABSTRACT

THE IMPACTS OF MOVEMENT CONTROL IN WORLD WAR TWO MEDITERRANEAN AND WESTERN EUROPEAN THEATER OF OERATIONS, by Junias M. Jackson, 101 pages.

In the World War Two (WWII) European Theater of Operations, Movement Control operations and structure began to formalize, and roles and responsibilities became more delineated and defined. For several decades post WWII, movement control experienced a high level of growth to the point of have a one-star movement control command. At the height of movement control growth, the Army sought to make way for growth in new units and technologies, while transforming for counter insurgency warfare. Through this, movement control structure frequently became the target as a bill-payer for the growth of other programs and units. As the Army transitions and returns to preparing for large scale combat operations, it must also learn from history to understand the future fight. WWII was the largest scale in which combat operations were ever executed and serves as the best example to follow in preparation for the future. Movement control in WWII Europe and Mediterranean provides a framework and guide to follow to understand the potential challenges and solutions for movement control in future operations.

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# ACRONYMS

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|---|---|
| ADSEC | Advanced Section |
| BUCO | Buildup Control Organization |
| CASCOM | Combined Arms Support Command |
| EMBARCO | Embarkation Control Section |
| HQ | Headquarters |
| MOVCO | Movement Control |
| TAA | Total Army Analysis |
| TMCA | Theater Movement Control Agency |
| TURNCO | Turn Around Control |
| U.K. | United Kingdom |
| U.S. | United States |
| USTRANSCOM | United States Transportation Command |
| WWI | World War One |
| WWII | World War Two |

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# CHAPTER 1

# INTRODUCTION

Since the Battle of Chancellorsville and the Union's innovative use of rail nodes to move troops, the U.S. Army has recognized the requirement for controlling the movement of troops, equipment, and materiel on the battlefield.[1] However, it was not until WWII in which there was a formal introduction and robust use of movement control organizational structures. These structures were patterned after elements of the British Royal Corps of Transport that were commonly known as Transport and Movement Regiments of the British Army.[2]

The Army defines movement control as "the dual process of committing allocated transportation assets and regulating movements according to command priorities to synchronize the distribution flow over lines of communication to sustain land forces."[3] Movement control is a specialty function of Army transportation that provides commanders with a mechanism to synchronize movements of personnel and equipment across the joint force and throughout the geographical combatant commands.

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[1] Richard Killblane, "The History of Movement Control" (History Report, Transportation Corps, Fort Lee, VA, 2016), 1.

[2] Gerald Feidt, "British vs. U.S. Movement Control" (Paper, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1947), 3, https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/223/rec/1.

[3] Headquarters, Department of the Army (HQDA), Army Techniques Publication (ATP) 4-16, *Movement Control* (Washington, DC: Army Publishing Directorate, 2013), 1-1, https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/atp4_16.pdf.

As a result of successes in WWII, the Army increased movement control capabilities and structures throughout postwar Europe. This growth of movement control capabilities quickly extended beyond Europe and into other regions of the world and contingency and combat operations. From 1973, at the height of a robust formation until today, the movement control structure has been reduced from a transportation enterprise of movement control agencies, centers, and teams, to a much smaller contingent of theater elements, battalions, and teams.

As the Army approached the 21st Century, the requirements for movement control operations decreased tremendously. Operations became smaller, shorter in duration, and required minimum movement control support that was usually performed by civilians under contract. In instances where uniformed movement control personnel were used, they sometimes worked outside of their doctrinal missions, causing confusion amongst leaders about their actual use. Based on peacetime experiences, force structure analyst began to question the utility of movement control, and over the past several decades the Army's movement control force structure was greatly reduced. It has become a regular target for reduction during the annual Total Army Analysis processes. As the Army transition to large scale combat operation, there are calls to further reduce the movement control structure in the Army. These calls for reduction come as the Army continuously searches for bill-payers for new emerging units in a zero-growth environment.

Total Army Analysis (TAA) is a process in which the Army determines its force structure within the limits of authorized end strength of civilians and soldiers.[4] It identifies capabilities gap needs and solutions to balance and align the fiscal constraint with force requirements. Every year the TAA process plans for the following five years, and each process is identified by the five-year period such as TAA 05-10, referring to 2005-2010. Overall, the process develops a force structure that is prepared to confront threats and meet national security objectives.

In January 2005, at the onset of the Total Army Analysis 08-13, Army leaders recommended the inactivation of four active component movement control teams (MCT).[5] In addition, the Army imposed an additional 30 percent mandatory reduction on active component transportation corps force structure.[6] However, this would only be the beginning of deep cuts to the movement control structure.

Between TAA-11 and TAA-13, the Army reduced movement control requirements by 30.75 percent. In TAA-11, the movement control structure only made-up 3.79 percent of the Transportation Corps. In 2013, that number was further reduced to 2.99 percent. However, in that same period, the Transportation Corps only decreased by

[4] Army Force Management School, *How the Army Runs: A Senior Leader Reference Handbook* (Carlisle: US Army War College, 2015), 3-25.

[5] U.S. Army Combined Arms Support Command (CASCOM), Force Development Directorate (brief to U.S. Army Combined Arms Support Command Leadership, Fort Lee, VA, December 5, 2005).

[6] Ibid.

12.31 percent.[7] These cuts to movement control structure, in comparison to the overall Transportation Corps, were disproportionate.

In December of 2015, the U.S. Army Combined Arms Support Command (CASCOM) Force Development Directorate warned of the impacts of the impending for cuts to the Transportation Corps, especially concerning movement control capability. The directorate noted that TAA did not accurately capture Transportation Corps requirements. In referencing specifically TAA 08-13, the directorate informed leaders that the requirements determinations and risk mitigation strategies significantly underestimated realistic requirements for motor transport and movement control.[8]

As the Army prepares for large scale combat operations against a near peer competitor, there are lessons to be learned from WWII, the most violent and largest scale war that the world has ever witnessed. There is much to learn from WWII that can be used now and in the future. Movement control operations in WWII are the model for movement control that will be conducted in future large scale combat operations. To accurately assess this claim, military leaders and staffs must examine the contributions of U.S. movement control in WWII and develop a conclusion as to how those actions, impacts, and consequences will fit into the fight of the future.

Movement control has taken many forms and functions throughout the years. In Iraq, Kuwait, and Afghanistan, movement control teams are generally comprised of a small number of contract civilians who coordinate movements, and pack and ship cargo

[7] CASCOM brief.

[8] Ibid.

and equipment to their destinations. In garrison, one will find that they are 21 soldier teams that sometimes assist logistic readiness centers in pre-deployment, post deployment and post training operations. In Europe, movement control plays a daily role in operations with oversight from the movement control battalions and assistance with the movement control teams. The responsibilities of the units in Europe go beyond daily mission support. For example, the 386th Movement Control Team in Vicenza, Italy once provided garrison assistance to the local national work force by maintaining passenger and vehicle counts. At one point, members of the unit were tasked to support Combined Endeavor 2012, by coordinating movements and driving participants to and from the airports. It is worthy of note that those host-nation support and other ancillary tasks are not part of the core mission set of Army movement control units.

Movement control is a key component of the military transportation function and therefore, the Army's Transportation Branch is the proponent. It has taken on various definitions that are to this day a subject on debate. In 1955, it was defined as, "The competent selection, allocation, and the use of transportation facilities for the government of personnel and things to meet military requirements with the maximum economy of resources.[9] In 1973, it was defined movement control as, "The planning, routing, scheduling, and control of personnel and supply movements over lines of

[9] The Transportation School, *Operation Overlord: An Historical Analysis* Transportation School Monograph 3 (Fort Eustis, VA. The Transportation School, October 1955), 26, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/id/4860/.

communication."[10] Within the corps, movement control is known as the art of transportation in combat to heavy lifting done by operational Transportation Corps units.

Thirty years later, in 2003, movement control as "the planning, routing, scheduling, controlling, coordination, and in-transit visibility of personnel, units, equipment, and supplies moving over line(s) of communication and the commitment of allocated transportation assets according to command planning directives."[11] In the latest and most current doctrine, written in 2013, it is defined as, "The dual process of committing allocated transportation assets and regulating movements according to command priorities to synchronize the distribution flow over lines of communications to sustain land forces."[12] Though there is much debate on the exact, stated definition, the concept and fundamentals remained the same. However, three things that have changed often are the unit names, design, and structure.

Current movement control structures include the Movement Control Team, Movement Control Battalion, and the Theater Movement Control Element. This is a major reduction from the height of its structure that included a Transportation Movement Control Agency (Theater Army Support Command), Transportation Movement Control

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[10] Headquarters, Department of the Army (HQDA), Field Manual (FM) 55-11, *Army Movement Control Units* (Washington, DC: U.S. Government Printing Office, 1973), R-1, https://www.bits.de/NRANEU/others/amd-us-archive/FM55-11%2873%29.pdf.

[11] Headquarters, Department of the Army (HQDA) Field Manual (FM) 55-10/4-01.30, *Movement Control* (Washington, DC: U.S. Government Printing Office, 2003), 1-1, https://www.hsdl.org/?view&did=783861.

[12] HQDA, ATP 4-16, 1-1.

Center (Field Army), Transportation Movement Control Center (Corps Support Brigade), Movement Control Teams, and Highway Regulating Teams.[13]

The concept of movement control has been executed and relevant throughout the U.S. military since the Civil War. During this time, because railcars ran on a single track, a system of timetables had to be implemented.[14] Therefore, in addition to there being a prioritization of cargo, there was also a prioritization of using the track. This level of coordination was the U.S. Army's introduction to movement control and node regulation and intermodal operations, all which are part of the movement control function.

The Battle of Chancellorsville was the earliest concept of regulating the movement of personnel and equipment in American military history. MG Joseph Hooker implemented the system of planned departure times for the Army of the Potomac. This concept reduced congestion by allowing each corps to arrive at staggered times.[15] Starting April 27th, MG Hooker sent the 5th, 11th, and 12th Corps, accompanied by nine batteries, to begin movement along the Rappahannock River. These forces were followed by the cavalry that followed the same path on April 28th. Later in the same day, under the command of General John Sedgwick, the First Corps under General John F. Reynolds moved south of Fredericksburg to stage near the river. This was followed by the quick construction of two pontoon bridges at Franklin's Old Crossing for the Sixth Corps with an additional two further south for First Corps. On the morning of the 29th, the infantry

[13] HQDA, FM 55-11.

[14] Killblane, "The History of Movement Control," 1.

[15] Ibid.

crossed the river at Morton and Racoon Fords *enroute* to Chancellorsville. By the 30th, General Hooker was in Chancellorsville with four corps because of programmed movements.[16] At Chancellorsville, the movement control operators coordinated the complex movement of large bodies of troops, horses, and wagons in a manner which ensured concentration of combat power

In WWI, the concept of movement control was a more decentralized effort. The Transportation Corps was not established until the day after the armistice, November 12, 1918.[17] Therefore, transportation operations were the responsibility of individual organizations instead of a single functional branch within the Army. Initially, the Railway War Board was established to coordinate movements, carriers and regulate the prioritization of car supply. The American Railway Association established the board, composed of executives and representatives for the six regional Army organizations.[18] However, the board did not have the capability to handle the increased throughput and had to be turned over completely to the military.

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[16] Abner Doubleday, *Campaigns of the Civil War: Chancellorsville and Gettysburg* (New York: Charles Scribner & Sons, 1882), 21, https://babel.hathitrust.org/cgi/pt?id=nyp.33433115689733&view=1up&seq=9.

[17] U.S. Army Transportation Corps Museum, "World War I: Shifting to Motor Transport," U.S. Army Transportation Corps, last modified October 6, 2020, https://transportation.army.mil/museum/wwi/index.html.

[18] Benjamin King, Richard C. Biggs, and Eric R. Criner, Center of Military History Publication (CMH Pub) 69-7-1, *Spearhead of Logistics: A History of the United States Army Transportation Corps* (Fort Eustis, VA: U.S. Army Transportation Corps; and Washington, DC: Center of Military History, United States Army, 2001), 94, https://history.army.mil/html/books/069/69-7-1/cmhPub_69-7-1.pdf.

As a result of the military being given control of transportation, the Army Transportation Service was responsible for the coordination and synchronization of movement at rail and sea nodes.[19] However, it did not have responsibility of the transportation ground mode. On July 11, 1918, the Motor Transport Corps was established to manage the Army's fleet of vehicles, coordinate the ground nodes, and synchronize truck movements.[20] Under this structure the G-4 provided a regulating officer, and the Director General of Transportation provided a representative at the regulating stations. Under the supervisory regime, the trains arrived on demand at the regulating stations or rail hubs and railcars were reassembled and prioritized by destination.[21]

During WWII, although the Army's Transportation Corps was in its infancy, it met the challenge and took on its responsibility of movement control. This was the first time "movement control" was formally recognized as a specialized function of transportation. The term and structures were based on the British counterparts who also had earlier adopted the concept. Of note, both shared the same definitions and objective of movement control. The definition shared was, "the regulation of the use of the transport capacity and of its movement," while the objective of movement control was "to so route and schedule personnel and supply movements to ensure the right amount of

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[19] Killblane, "The History of Movement Control," 1.

[20] Richard Killblane, "70 Years of the Transportation Corps," U.S. Army Transportation Corps, last modified February 27, 2020, https://transportation.army.mil/history/

[21] Killblane, "The History of Movement Control," 2.

personnel and materiel at the right place at the right time." As much as U.S. and U.K. movement control shared similarities, they also shared differences, primarily the organizational structures and operational approaches.[22]

In the U.S. structure, there was a chief of transportation assigned to each theater of operations that was under the direct operational control of the theater commander. Under operational control of the chiefs of transportation, were tailored numbers of regional transportation officers who were assigned to the staffs of the base section commanders throughout their assigned region. To further support their efforts, they assumed oversight of district transportation officers who further managed the traffic railway officers.[23]

The Army had Traffic Regulating Groups that used the Group Traffic Regulating Station to manage traffic in the communication zone. Over time, the groups used regulating companies to provide the full capability of movement control. The companies, that would later become detachments, ultimately provided movement control at ground, sea, rail, and air transportation nodes, and enabled intermodal operations at their hubs.

Movement control further formalized, expanded, and evolved as WWII progressed. This continued in the post-war era, to include the Cold War, the Korean and Vietnam War periods. The movement control structure expanded to the point of having Brigadier General level commands. At its height, the Transportation Movement Control Agencies (Theater Army Support Command), Transportation Movement Control Centers

[22] Feidt, "British vs. U.S. Movement Control," 3.

[23] Killblane, "The History of Movement Control," 2.

(Field Army), Transportation Movement Control Centers (Corps Support Brigade), Movement Control Teams, and Highway Regulating Teams.[24]

As new threats emerged and the battlefield evolved, this structure became less effective in the Army's new doctrine and modernization efforts.[25] The design had very little flexibility and had difficulty adapting transportation requirements in the changing environments the Army had experienced in the post-war period. The static structure and dated functional capabilities placed a strenuous burden on the MCTs across the Army. MCTs started to perform roles on the battlefield that were beyond their doctrinal mission. This led to some element of confusion with leaders and planners, resulting in them questioning the MCTs' exact roles in combat.[26] Regardless of these facts, the movement control requirements increased over time even as the structure decreased.

Studies of the U.S. movement control in WWII are limited outside of the academic studies conducted by students at the U.S. Army Command and General Staff College. In the late 1940s, several students in the U.S. Army Command and General Staff College conducted staff studies of transportation and movement control during WWII. Some students took on a broader approach in discussing transportation movement control as part of a holistic discussion, while one student, LTC Gerald Freidt, took an independent writing approach.

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[24] HQDA, FM 55-11, 3-6.

[25] Ibid.

[26] U.S. Army Combined Arms Support Command (CASCOM), "Movement Control Team Force Design Update Operational Concept Paper," (presented at the Force Development Directorate's Force Design Update Meeting, July 15, 2004).

In 1947, U.S. Army Infantry Officer and student, LTC Gerald Freidt, authored one of the earliest analyses of movement control, examining British vs. U.S. Movement Control. His writings were primarily focused on the differences between British and U.S. movement control structure and operations. The study discussed and analyzed the advantages and disadvantages of operational structures and potential solutions in U.S. operations. Though WWII was not the focus of the paper, its perspective was centered on operations in WWII since this was the first time that the concept of movement control was formally applied in a wartime environment as a distinct transportation functionality.[27]

In 1949, Army Transportation Officers, LTC James Brewer, LTC Richard Kimball, MAJ Rhoman Clem, and MAJ Frank Speir conducted logistical studies. The studies were requirements for the U.S. Army Command and General Staff Officer College' s Logistics Specialized Course and focused on logistics operations in large scale ground combat operations. LTC James Brewer's and LTC Richard Kimball's study focused on movement control in unified theater of operations. MAJ Rhoman Clem and MAJ Frank Speir focused on transportation in unified theater of operations study. Movement control, being a functional part of transportation, is a significant element of their study. The purpose of these studies was to discuss transportation's and movement control's role in large scale combat operations. This included the logistical integration into a joint environment and recommendations to centralize movement control under one

[27] Feidt, "British vs. U.S. Movement Control," 1.

organization. The discussion and recommendations were based on the operational structures, experiences, and actions in WWII.

Brewer explored in detail about movement control operations of WWII. One of the key discussion points in his analysis is, movement control was a new formalized function that was mostly created and refined in WWII.[28] Brewer's writings were prescient in that they focused on the ways which movement control would operate in future war. His ideas would come to fruition decades later in modern Army Transportation Corps structure. In fact, one could make three arguments about his writing on movement control in unified operations. First, that the scale of the future war he discussed has not occurred. Next, the force structure change described, discussed, and recommended is what would later become known as the Theater Movement Control Agency (TMCA). Finally, his thesis may be the genesis of the topic of how the military can use WWII as an example to fight in future large scale combat operations. It is incumbent on current logistics leaders to pick up where LTC Brewer left off and fill the learning gaps for future operations.

Kimball's discussion was centered on determining organizational and procedural requirements for movement control in large scale combat operations. His opening assumptions is that the future war the Army, Navy and Air Force would maintain jurisdiction over their respective domains and be responsible for all transportation within. It is important to note that he stated that there was not any formality in doctrine and

[28] James Brewer, "Movement Control in Unified Theater of Operations," (Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949), 1, https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/326.

policy for movement control prior to WWII. This further solidified and confirmed the notion that movement control evolved and formalized in WWII. Kimball concluded that movement control, monthly movement programs, and the conveyance of information from tactical to operational levels, were necessary for smooth and efficient transportation operations.[29]

Clem's 1949 staff study discussed operational deficiencies in the Mediterranean and European theaters in WWII. He focused on the negative impacts on transportation operations because of the lack of clearly defined tasks and centralized control. Clem also drew comparisons between both the Mediterranean and European theaters of operations and discussed the various challenges, learning and progression that occurred. From his analysis, he developed two main conclusions. First, that transportation and the process of movement control needed to be consolidated for all services. Second, he recognized the need for centralized control of transportation to include for non-tactical transportation.[30]

Speir's focused on efficient ways transportation could be organized in a theater of operations under a unified command. His underlying assumption was large scale combat operations of the future will be comparable to warfare of WWII. Speir's discussion was more focused on various node operations, a component of movement control, rather than overall transportation mission. However, he made a clear distinction between movement

[29] Richard Kimball, "Movement Control in Unified Theater of Operations," (Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949), https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/327/rec/4.

[30] Rhoman Clem, "Transportation in Unified Theater of Operations," (Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949), https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/385/rec/2.

control and node operations. This was likely because movement control had not yet been clearly defined and transportation operations at nodes were worked by units that specialized in those nodes. In his discussion of movement control, he recognized its importance movement control but also recognized that it was not yet fully understood. He drew comparisons of movement control with the British Army and concluded that adapting its model during WWII would be the best option for preparing for the next major conflict of the future.[31]

These staff studies provided a glimpse of the movement control challenges in WWII. They highlighted many of the problems faced by transportation planners as well as the soldier who executed those plans. However, the challenges discussed in these staff studies only represented a fraction of the daily problems that transportation and movement control soldiers faced.

One major challenge during WWII was the lack of centralized movement control. As will be shown in the proceeding chapters, there were other units that performed some forms of movement control. Units such as the port and rail battalions performed movement control in the absence of support even though their primary missions were tethered to geographical locations verses specific operations. These units performed movement control in their assigned areas as conditions and demand dictated. In some instances, units worked along with movement control units to support mutual units and efforts. Other units such as higher headquarters staff sections served as augmentation

[31] Frank Speir, "Transportation in Unified Theater of Operations," (Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949), https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/386/rec/1.

support for movement control or developed its own movement control section from within. In other situations, movement control elements would send teams to augment higher headquarters staff and serve as liaisons between both units. In the following chapters, the contributions to WWII by the movement control elements, both in label and those transportation units that had operated in those functions will be discussed.

# CHAPTER 2

## MOVEMENT CONTROL STRUCTURE

During WWII, movement control was in its infancy. It was a new idea based on British practices and force structure. It was not uncommon for U.S. forces to adopt a British transportation concept and both versions of movement control shared many of the same components. At its founding in 1939, both armies shared the same definition for movement control, "The regulation of the use of the transport capacity of its movement." They also shared some of the same doctrinal tenets such as centralized control, balanced requirements for movements, and conducting movements in an economic and efficient manner.[32] However, the U.S. and U.K. versions of movement control had many differences including organizational structure and execution of tasks.[33]

In the U.S. Army during WWII, there was not a not a named movement control unit. It was only at the theater level where organizational divisions and sections were designated movement control, and they were mostly staff sections within transportation divisions. Many of the duties and responsibilities were divided amongst various transportation organizations and staffs at different echelons of support. Some Army units regulated movements and committed transportation assets and mode operators, while others performed highway regulation, manned transportation nodes, and developed route plans.[34] In other cases, movement control organizations were multinational staffs or

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[32] Feidt, "British vs. U.S. Movement Control," 2.

[33] Ibid., 3.

[34] U.S. Army Transportation School, *Operation Overlord*, 8.

agencies that performed movement control at the theater level for a specific reason or mission such as a buildup or embarkation of forces. Though the Americans worked closely with their British Allies, they also maintained a level of separation in logistics.

Initial plans were for the chiefs of transportation to be the lead agents for movement control amongst other theater transportation functions. However, as the war progressed, centralized control of movements became increasingly challenging.[35] The chiefs of transportation were assigned to a theater of operations and were under the operational control of their theater commanders.[36] They were primarily responsible for troop movements and at operations at Army ports of embarkation. Because the Transportation Corps was such a new addition to the Army, its role and responsibilities were only beginning to be defined. As a result, the delineation between transportation and quartermaster corps duties, units, and assets were not yet clearly defined. Those assets not controlled by quartermaster such as seas assets, were controlled by the Navy and other agencies such as the War Agency Administration and British Ministry of Transport.[37] Though the responsibilities, authorities, and scopes varied by chiefs of transportation, the theater commanders delegated authority to the base sections through the regional, district, and regulating transportation officers

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[35] U.S. Army Transportation School, *Operation Overlord*, 8.

[36] Killblane, "The History of Movement Control," 1.

[37] Chester Wardlow, Center of Military History Publication (CMH Pub) 10-20, *The Transportation Corps: Movements, Training, and Supply* (Washington, DC: U.S. Government Printing Office, 1990), 85, https://history.army.mil/html/books/010/10-20/CMH_Pub_10-20.pdf.

Though the theater chief of transportation had overall responsibility for movement, it was the local headquarters G-4s that were responsible for the movement control of traffic. This was often executed through the transportation division or movement control section that was established within the G-4. Coordination between agencies depended on the echelon in which they were operating. For example, the regulating officers coordinated between the communication zones and the forward areas. The field armies coordinated between the army service area and the corps rear area. The corps coordinated between the corps rear area and the division support area. The G-4s developed and implemented movement control measures, monitored traffic circulation, and coordinated with various agencies for movement. The Corps of Engineers G-4 coordinated maintenance, while the military police worked closely with the traffic control points to enforce highway regulation.[38]

Soldiers under the Chief of Transportation were also sent out as various teams under the operational control of their local commanders. They operated to facilitate and augment movement control efforts at the base sections, sectors, and ports of embarkation/debarkation. These soldiers provided movement control directly in support of marshalling yard movements. Transportation soldiers had the responsibility to control the movements of personnel and equipment within the marshaling areas. Their main tasks were to organize units into chalks and serials for movement, and to create and distribute unit movement manifests. They also had the responsibility to coordinate the movement of

[38] War Department, War Department Field Manual (FM) 100-10, *Field Service Regulations Administration* (Washington, DC: United States Government Printing Office, 1943), 155, https://www.ibiblio.org/hyperwar/USA/ref/FM/PDFs/FM100-10.pdf.

ship loads from the marshaling areas to the ports of embarkation. The transportation soldiers in the sector headquarters had similar duties and were tasked with providing movement control in each sector, organizing units for movement, and creating unit movement manifests.[39] At the ports of embarkation, the soldiers were tasked with coordinating and supporting the movements of ship loads and their movement credits for temporary berthing while waiting to embark. This was performed by transportation staff officers who specialized in embarkation and debarkation operations.[40]

The regulating officers had command of the regulating stations and were direct representatives of the theater commander. The officers established and implemented priorities of movement, and designated rail and ground node locations in the areas of operation in accordance with the recommendations from army commanders and the policies of theater commanders.[41] Movements within the regulating officers' area of responsibility were not authorized without the officer's authorization. They coordinated movements of supplies from the communication zone depots to the forward areas. They also had the responsibilities of develop priorities of movements for supply, personnel, and hospital trains in the immediate area.[42]

Other primary responsibilities of the regulating officers were to maintain oversight of movements and resupply, and ensured they were nested with the maneuver

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[39] U.S. Army Transportation School, *Operation Overlord*, 8.

[40] Ibid., 9.

[41] War Department, FM 100-10, 41.

[42] Ibid., 43.

plans and unit locations. They served as the primary points of information consolidation for the communication zones, theater armies, and theater headquarters. The communications zones provided the regulating officers information regarding the pending movements of personnel, animals, and various classes of supplies to the forward areas. The field armies provided the regulating officers with daily personnel strength reports, priorities for rail operations, and other information. The theater headquarters provided the numbers of convoy clearances in the communication zones, priorities of movements, and hospital train allocations and availability.[43] The regulating officers were also the movement control officers for all rail movements past the advanced depots in the communication zones and of holding and reconsignment points between the depots and the regulating station. In addition, the Military Railway Service provided the status of railway equipment, trains, and schedules. However, this arrangement was different than the others because the Military Railway Service also provided representatives to the regulating officers who were embedded with the staff. They served as advisors on the Military Railway Services' capabilities and constraints in relation to supported units' requirements. The representatives coordinated movements of traffic between depots, reconsignment points, or rail node locations.[44]

Although movement control was executed at the battalion and company level, they were not designated as movement control organizations. They were instead identified more on a functional basis but still retained their organic movement control

[43] War Department, FM 100-10, 41.

[44] Ibid., 50.

capabilities. These units were theater assets, assigned to the local command but were under the tactical command of the movement control leadership, primarily the regional and district transportation offices.

The Transportation Corps was reluctant to send the regulating stations and openly objected to their deployments and participation in the European or North Africa Campaigns. However, the 12th Army Group Headquarters' staff viewed the regulating stations capabilities as necessary to fill capabilities gap in transportation operations. They pushed issue and overcame the objections of the Transportation Corps.[45]

The regulating stations were the traffic control agencies. Their primary purpose was to prevent or minimize congestion at transportation nodes and facilitate movement of supplies and troops for in the rear areas. Their capabilities included the movement of various classes of supplies and personnel to and within the theater of operations. Regulating stations' movements also included the coordination for evacuations of casualties, prisoners, damaged equipment, and other retrograde missions.[46]

The regulating stations were primarily established in the communication zones, primarily in locations where existing facilities were already established. Their employment was based on establishing on lines of communication, providing movement control of supply and personnel between combat and contingency areas of operations. As

[45] Raymond G. Moses, Charles J. Norman, Alvin H. Parker, Herbert F. Gagne, and John C. Henion, "The Mechanics of Supply in Fast Moving Situations," (Study Number 27, The General Board, United States Forces, European Theater, June 1945), 47, https://usacac.army.mil/sites/default/files/documents/carl/eto/eto-027.pdf.

[46] War Department, FM 100-10, 39.

requirements dictated, the regulating stations also provided movement control from other parts of theater not included in the war, to the theaters of operations.[47]

Another organization that performed movement control within the communication zones was the Military Railway Service. Like the regulating stations, the theater chief of transportation had overall responsibility for railway operations. While railway units received their instructions from the transportation command and control channels, they were under the operational control of their communication zone commanders.[48]

The railway battalions were the units that operated and maintained the railway divisions. In some situations, they could be assigned to operate a regulating station. Unlike other units, the railway battalions did not have organic movement control. Instead, they relied on external support from detachments of the quartermaster companies (railhead) to provide the movement control and operations at rail nodes. These detachments were generally commanded by a rail officer, but operational control was exercised by the regulating officer.[49]

Though much of this discussion is focused on movement control planning, policy and implementation, its impacts were the result of proper execution at the ground level. As mentioned previously, in WWII, movement control occurred in a decentralized manner as a capability of an organization. Many transportation units and elements

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[47] War Department, FM 100-10, 39.

[48] Ibid., 49.

[49] War Department, Technical Manual (TM) 5-400, *Military Railways and Inland Waterways* (Washington, DC: United States Government Printing Office, 1942), 10, https://archive.org/details/TM5-400.

performed some version of movement control. However, it was the port units and their subordinate port battalions and companies that was the major force behind movement control operations. These units were the execution arm of the regulating officers. The regulating stations and railway service did their parts to manage, regulate and coordinate movements. However, the port units had to do the same on a smaller port scale but with the added requirements to manage personnel movements, as well as loading, unloading, receiving, and shipping equipment and cargo.

The port headquarters companies were brigade level commands with generally four battalions. Internally to the Transportation Corps they were designated as major or medium port units depending on their assignments and units under their operational and tactical control. The major port units had an authorized strength of 519 soldiers, which included 109 officers, 1 warrant officer, and 409 enlisted. They had the capability to handle 10,000 tons of cargo and 1,667 personnel per day. The medium port units had an authorized strength of 360 authorized personnel and had the capability to handle 5,000 tons and 833 personnel daily. Except for key leaders, total personnel authorizations were often unfulfilled and when possible, shortages were filled by subordinate units.[50]

The port headquarters units also had to deal with the problems of racial stereotypes and misconceptions, which had a major impact on requirements and force structure. Many black soldiers were placed in segregated port units. As a result of the rush to create and deploy the units, along with the changes in training, there was very little consistency in the performance of port units. This disparity in education and

[50] Warlow, CMH Pub 10-20, 433.

training, caused misconceptions that black port units could not perform on the same level as their white counterparts. Initially, the Department of the Army G-3 only intended for the black port units to work in the United States to relieve white units so they could work where the Army needed its best effort, overseas in the war effort. In 1943, even as the European Theater of Operations Chief of the Transportation MG Ross requested three port headquarters and 12 port battalions, he insisted that the units be all white. However, the War Department's Operations Division informed the G-3 that attempts to exclude the black port units would not be possible if the Army was to meet its overseas demand.[51]

The various structures of movement control and in some instances, its lack of, presented its own challenge. As the structures expanded and shifted in response to the rapid changes that occurred during execution, transportation planners and units also had to respond had to respond in kind. Movement control was a new idea without a dedicated, centralized structure. As the Allies maintained a level of separation in logistics, movement control remained a combined effort, dependent on all stakeholders. The following chapters will discuss the challenges of movement control. They will show how it occurred in a series of decentralized executions and the impacts that it made in WWII.

[51] Ulyses Lee, Center of Military History Publication (CMH Pub) 11-4-1, *The Employment of Negro Troops* (Washington, DC: U.S. Government Printing Office, 2001), 419, https://history.army.mil/html/books/011/11-4/CMH_Pub_11-4-1.pdf.

# CHAPTER 3

## MEDITERRANEAN THEATER

The Mediterranean Theater of operations in WWII included North Africa, Italy, and Southern France. Operations were designed to weaken Axis forces, set conditions for Normandy, and provide forces to augment follow on operations.[52] The operations took a bottom-up approach towards the European continent by applying pressure on Vichy French and Axis Italian forces to the point that they no longer aligned themselves with Nazi Germany.[53] Operations also enabled the port openings in Eastern Italy, which allowed the 12th and 15th Air Forces, to stage and execute operations against targets in southern Europe.[54]

Initial plans were for MG Frank S. Ross to be the Chief of Transportation for the buildup in England, followed by the Mediterranean and Normandy campaigns. MG Ross arrived in North Africa as the chief of transportation under the Mediterranean Service of Supply, commanded by MG Thomas Larkin. This position was short lived because MG Ross had such bad relationship with the British Army that he was transferred back to England as the European Theater of Operations Chief of Transportation. In May 1942,

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[52] Dwight Eisenhower, *Report by the Supreme Commander of the Allied Expeditionary Force* (Washington, DC: U.S. Army Center of Military History, 1945), 8, https://history.army.mil/html/books/070/70-58/index.html.

[53] Joseph Bykofsky and Harold Larson, Center of Military History Publication (CMH Pub) 10-21, *The Transportation Corps: Operations Overseas* (Washington, DC: U.S. Government Printing Office, 1990) 184. https://history.army.mil/html/books/010/10-21/CMH_Pub_10-21.pdf.

[54] George Stewart, interview by Tymothy Caddell (Asheville, NC, June 7, 1985), https://transportation.army.mil/history/GO_bios/stewart.pdf.

MG Larkin, appointed BG Stewart as the Chief of Transportation for the Mediterranean Theater of Operation.[55] The position required BG Stewart to work outside of the prescribed, doctrinal role of chief of transportation. He was required to serve as the Chief of Transportation for the Allied Forces Headquarters, U.S. Army Headquarters, and the Mediterranean Service of Supply, all which had separate transportation divisions. For the Allied Forces Headquarters, he coordinated efforts with a British general. Under this arrangement, the base section and military railway commanders retained operational control, while BG Stewart handled issues involving two or more base sections.[56] The arrangement, as complex as it may seem, did much to reduce the confusion between organizations that were later seen in the European theater. The arrangement reduced duplication in sustainment support and efforts. As a result, the allies were able to better conserve resources to support future upcoming battles and operations in other theaters. The arrangement also prevented transportation and logistics requirements from being processed through the wrong command channels. This great increased throughput and lead times and further facilitated the seamless flow of support to the combat forces.[57]

WWII veteran, Associate Professor and former Historian at the Office of Military History, Dr. James Huston described the situation in the North Africa campaign as, “a

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[55] Stewart interview.

[56] Bykofsky and Larson, CMH Pub 10-21, 150.

[57] Chester Wardlow, Center of Military History Publication (CMH Pub) 10-19, *The Transportation Corps Responsibilities, Organization, and Operations* (Washington, DC: U.S. Government Printing Office, 1999), 83, https://history.army.mil/html/books/010/10-19/CMH_Pub_10-19.pdf.

graduate school in logistics when too many officers had not yet competed elementary."[58] This only begins to describe the challenges U.S. Army logistics units faced in the theater of operations. Many of the challenges were centered on the limited infrastructure to support to support transportation operations. However, this provided the units with experience required innovate and prepare for follow on missions in Europe.

The Allied Forces Headquarters was responsible for the general logistics support for the invading forces.[59] At the operational level, the Allied Forces Headquarters G-4 movements and transportation sections, coordinated and developed general policy for transportation operations. At the tactical level, the regulating stations, railway battalions, and port battalions were the primary units with functional movement control missions.[60]

[58] Keith Beursken, *Long Haul: Historical Case Studies of Sustainment in Large Scale Operations* (Fort Leavenworth, KS: Army University Press, 2018), 55, https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi-books/the-long-haul-lsco-volume-4.pdf.

[59] King, Biggs, and Criner, CMH Pub 69-7-1, 176.

[60] Killblane, "The History of Movement Control," 2.

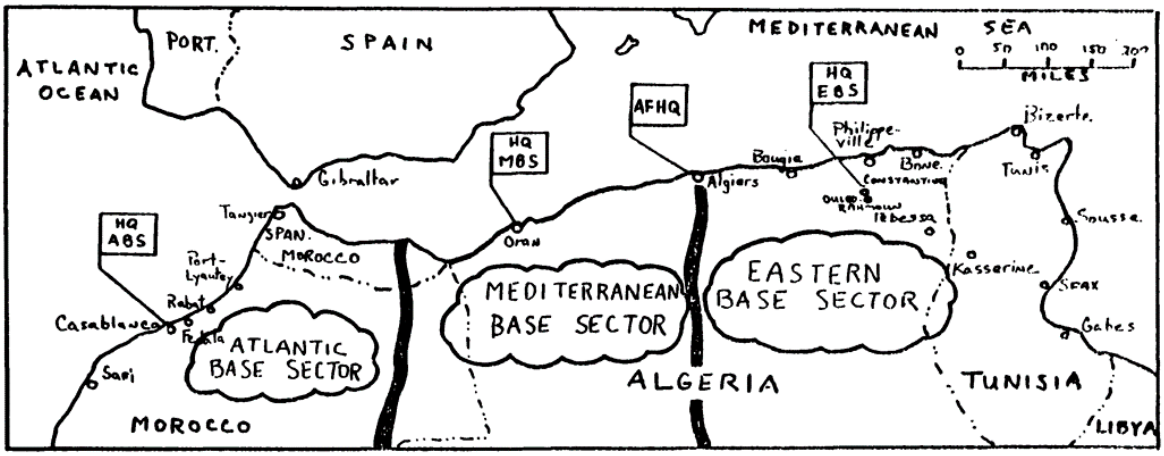


Figure 1. Mediterranean Base Section Mission Area

*Source:* Mark Kitchen, "The North Africa Campaign: A Logistics Assessment," (Master's thesis, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1991), 45, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll2/id/1387/rec/1.

Allied forces landed in North Africa on November 8, 1942.[61] Initially, the Allied Forces Headquarters established two base sections in North Africa, the Atlantic Base Section in Casablanca, and the Mediterranean Base Section in Oran. They were responsible for all operations including inbound and outbound clearance transfers to intermediate bases and staging areas, and also for final destination transportation. Various other functions and capabilities included movement control, medical evacuation, mortuary affairs, and contracting.[62]

The base sections were led by transportation officers and assigned the transportation and logistics operations in their assigned areas. The Mediterranean Base

[61] King, Biggs, and Criner, CMH Pub 69-7-1, 176.

[62] Kitchen, "The North Africa Campaign," 1.

Section, led by COL Thomas Stanley, was primarily responsible for operations in Algeria.[63] The Atlantic Base Section, led by BG Arthur Wilson, was primarily responsible for the Atlantic area.[64] The base sections remained under the operational control of the Allied Forces Headquarters until February 23, 1943. At this point they came under the operational control of the Supply of Services North African Theater of Operations United States Army with the chief of transportation retaining tactical control for transportation.[65]

The Eastern Base Section was established in February 1943, to bolster the lines of support for the Allied advance into Tunisia. This expansion in support was critical to the success of the ongoing combat operations. The rail and highway nodes from Casablanca, Oran, and Algiers did not have the capacity required to support the Allied Forces efforts of advance.[66] This problem became worse as more assets and facilities were committed than what was available.[67] To close this gap in transportation capabilities, the use of local contracted drivers, vehicles, storage space, and laborers were phased into transportation operations. However, the Eastern Base Section found it very difficult to exercise control over contractors due to communication barriers and work culture. Additionally, the local contractors often proved to be substandard and slow. The base section addressed this

[63] King, Biggs, and Criner, CMH Pub 69-7-1, 181.

[64] Kitchen, "The North Africa Campaign," 1.

[65] Ibid., 46.

[66] Bykofsky and Larson, CMH Pub 10-21, 158.

[67] Ibid., 166.

problem and established a movement control system, which proved to operate effectively in future operations.[68] It implemented a weekly movement plan that accounted for all internal and external support; ensured transportation requirements were matched against available capabilities and were approved by the base section's G-4.[69]

The North Africa Theater faced increasing challenges to transportation and movement control. The volume of shipments ebbed and flowed due to unpredictable surges in inbound shipments. The theater suffered from a lack of manpower, requiring the contracting of local labor, which created communication problems. The use of hired local labor presented increased security and supervision requirements, requiring the use of resources and manpower from other logistics efforts. The transportation and movement challenges were further compounded by the reduction in logistics capacity at Casablanca in March 1943.[70]

The ports at Oran and Casablanca were the primary locations for embarkation and debarkation operations in North Africa. Like other key logistics nodes in the theater of operations, they faced many of the same challenges and conditions. However, they also had many of the same advantages such as sufficient cargo handling equipment and suitable berths. The ports also depended on outlying smaller ports in their vicinities to supplement shipping and storage capacity.

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[68] King, Biggs, and Criner, CMH Pub 69-7-1, 182.

[69] Bykofsky and Larson, CMH Pub 10-21, 166.

[70] Ibid., 153.

On November 12, 1942, 3rd Port, began operations in Oran. Under the command of COL Edward Lastayo, it was accompanied by its subordinate units, 397th and 399th Port Battalions. Upon arrival, they found the port disorganized and in pure disarray. The limited capacity piers, warehouses, and harbors were littered with various commodities. There was an urgent need for port clearance to avoid congestion.[71] However, congested port conditions and port clearance challenges were not unfamiliar to the 3rd Port. As the next chapter will discuss, the unit had at least four months of work experience at the Bristol Channel Port prior to its arrival to Oran.

One of the primary issues at Oran was the lack of manpower support to conduct 24-hour operations. To address this, the 3rd Port hired approximately 3,000 local contractors. Another challenge was the inability to maintain the momentum of movement and ensure a seamless flow of transportation traffic. The ability to transport equipment and troops in the most expedited manner depended on the coordination between the various sea, rail, and motor transport modes. The ports had transfer points connected to rail networks, but they were limited to certain locations, making port clearance primarily dependent on ground transport. In response, the 3rd Port established a movement control element in its headquarters, the provisional 6697th Company. The 6697th's purpose was to take sole responsibility for motorpool operations and to provide movement control and direction for motor vehicles.[72] The arrangement centralized movement control and relieved the various service supply elements from transferring their cargo from the ports.

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[71] Bykofsky and Larson, CMH Pub 10-21, 156.

[72] Bykofsky and Larson, CMH Pub 10-21, 157.

The 3rd Port also had to contend with the persistent problem of theft at the port area and depots. There was not any coordination or arrangements for a military police presence or to have port guards. Commercial sailors, local contractors, and even military personnel were frequently involved in criminal trespass and theft.[73] As a result the unit acted and implemented various control measures to address the issue of pilferage. The 3rd Port conducted summary court-martials and tasked two engineer companies to perform military police duties. It also mandated all shipments be transported through a single point of entry in the gate. The items deemed most likely to be stolen, such as alcohol and Post Exchange merchandise, were escorted by guards. These control measures, though effective, had major consequences for on operations because they reduced manpower, command and control, and productivity. The numbers of soldiers to support operations were already inadequate for the increased throughput of equipment and supplies. In addition to guard duty and increased supervision of local contractors, the summary courts-martial sometimes reached as many as fifty trials in a day. Though these actions were necessary, they diverted significant amounts of manpower and resources. Despite these setbacks, the 3rd Port was able to continue its mission of supporting two of the three task forces of assigned to the theater, totaling approximately 71,300 soldiers.[74] In February 1943, the port reached its peak capacity of 38 liberty ships and a total of 206,195 tons.[75]

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[73] Kitchen, "The North Africa Campaign," 89.

[74] Bykofsky and Larson, CMH Pub 10-21, 137.

[75] Ibid., 158.

Even as support operations seemed to have run efficiently, its operational structure lacked sufficient personnel. On November 19, 1942, the Army launched the first and largest deployment of support troops to the North Africa. The 6th Port, under the command of COL Howard Parrish, arrived at Casablanca to provide movement control and port operations. The unit was accompanied by its two subordinate battalions, the 382nd and 384th, neither of which had experience in port operations. Initially there was much confusion, and the ports became congested. In the absence of any movement control element or port support, ships, in a hurry to return to the U.S., were quickly unloaded without any organization. Shipments were dumped and commodities such as gasoline, ammunition, and food were stored together.[76]

The port battalions immediately went to work and by November 29th, all cargo from the accompanying D + 5 ship convoy was downloaded, organized, and staged for follow on movement. As the battalions continued their efforts, they were faced with the shortage of manpower and transportation assets to support the Western Task Force of approximately 36,000 troops. The Western Task Force G-4, COL Walter J. Mueller informed the 6th Port it would receive 200 2 ½ ton trucks with trailers and additional drivers daily to allow for 24-hour operations. Due to competing requirements, the 6th Port only received 72 trucks. By December, the unit gained additional troops, local contract labor, and cargo handling equipment. The good news was that the cargo was downloaded and moved rapidly and efficiently. The bad news was that the onward movement capacity at the port quickly overwhelmed. This was followed by the arrival of

[76] Ibid., 154.

the second support convoy that consisted of twenty-five ships of 132,362 tons of cargo and troops. In less than twenty days the port unloaded all of the ships. The battalions approached the problem of movement control for these troops and cargo by dividing the outbound movements into separate categories for their final destinations. While materials and chemicals were sent to the interior zone, troops and packed cargo was sent forward.[77] The arrival of 379th and 480th Port Battalions to Casablanca provided additional manpower, which was augmented by additional local labor, averaging 1,000 people a day. At the end of 1942, port congestion was virtually nonexistent. By March of 1943, activity at the port reached its maximum capacity of 156,769 tons.[78]

Overall, the 6th Port's actions in Casablanca resulted in the controlled movement of over 1.5 million tons of cargo, two-thirds of which were received in the initial nine months of operations. After March of 1943, Casablanca was only used as secondary port at partial capacity. Logistics leaders determined other ports throughout the Mediterranean had shorter, more secure distances and were closer to where the campaign shifted, the Tunisian front.[79]

In Tunisia movement control operations were expanded to three British controlled ports, Philippeville, Bône, and Bizerte to support the final offensive operations. As Allied Forces advanced east, U.S. Forces, occupied these ports and assumed port operations, responsibilities, and transportation support operations. The Port of Philippeville, located

[77] Bykofsky and Larson, CMH Pub 10-21, 155.

[78] Ibid., 156.

[79] Bykofsky and Larson, CMH Pub 10-21, 156.

in Algeria and 400 miles east of Oran, came into use by American Forces in March 1943. The port presented several challenges to the movement control personnel to overcome. Initially the port did not have the capability to support ships that required berthing in deep water, and it had a maximum capacity of 1,680 tons. To address this issue the harbor area was later dredged and made to accommodate deep draft ships and personnel and equipment support were increased. Once movement control elements addressed their initial challenges, they established a functioned system. Once cargo was downloaded at the port, it was staged transport by rail or trucks, 80 miles south to the general depot, followed by the advanced dump at Tebessa.[80]

Though limited in its movement control capabilities and contributions, the 727th Railway Battalion's efforts facilitated this movement to Tebessa. The battalion operated under the railway grand division, a subordinate organization to the 1st Military Railway Service. Its role was to provide transportation from Tebessa to the depots in Ouled Rhamoud because the route lacked a suitable highway for transport.[81] The battalion moved a daily average of 2,200 tons across 122 miles, a 40-hour journey. [82]

Located 67 miles east of the Port of Philippeville, the Port of Bône, was also located in Algeria. Unlike, the Philippeville, from the outset, it had the capability to support ships that required berthing in deep water. One of the challenges that encumbered

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[80] Ibid., 158.

[81] United States Army, 727th Railway Operating Battalion, *The 727th Railway Operating Battalion in World War II* (New York: Simons-Boardman, 1948), 18, https://ia601205.us.archive.org/9/items/727thRailwayOpBattalionWWII/727thRailwayOpBattalionWWII.pdf.

[82] Ibid., 23.

movement control operations at Bône was the cargo discharge zone's proximity to constant air raids.[83]

In the latter part of May 1943, the 8th Port took control of the Port of Bizerte. The port was located approximately 150 miles east from Bône and was of special strategic importance and value. It had the unique advantage of being approximately 149 miles from Sicily and near suitable rail and highway networks in Northern Tunisia. The Port of Bizerte had the disadvantage of being a victim of both Allied and Axis bombings. To overcome this, the 8th Port developed standardized procedures that ensured that the harbor was clear of obstructions and cargo was immediately moved from the port and out of harm's way. On June 12, 1943, and the 8th Port provided movement control and transportation for the first of two liberty grade ships to enter the harbor. By the end of the month the volume of inbound shipments and throughput increased to over 3,000 tons of cargo and 10,000 tons of bulk petroleum per day.[84]

The dependence on movement control of ground operations increased drastically with the Allied efforts to take Tunisia. The centralized control of ground movements was imperative because most movements were conducted using the units' organic assets with augmentation by the 2638th and 2640th Quartermaster Truck Battalions, further complicated by the conversion of several maneuver units to form provisional truck battalions. To maximize use of the limited transportation infrastructure transportation operators had to affect positive control on all aspects of movement in the port and rear

[83] Bykofsky and Larson, CMH Pub 10-21, 158.

[84] Bykofsky and Larson, CMH Pub 10-21, 159.

areas. This required movement control procedures that enabled close coordination between U.S., British, and French forces. These movement control efforts included the implementation of traffic control stations every thirty miles with communication capabilities. The traffic control points were used to accurately track, deconflict and if necessary, reroute convoy movements. These positive movement control operations and procedures greatly enabled the movement of over 100,000 U.S. 2nd Corps troops from the southernmost flank to the rear boundary of Allied forces.[85]

Though operations to move forces forward were successful, the shifting of forces caused by operational necessity had a major impact on movement control operations. Transportation operations suffered from an increase in traffic and congestion in an already overburdened transportation network. Increased fuel consumption, supplies and equipment soared beyond original estimates and needed to be added to into movement planning and capacity. As a result, this further damaged the transportation network where infrastructure was already in poor condition.[86]

The lessons the Army learned from the Operations in North Africa also had several positive impacts on future operations. Movement control elements earned hard-earned experience, and learned how to overcome logistical challenges, which prepared them for the future challenges of Europe. The Ports of Oran and Bizerte were identified as potential hubs for future operations in Southern European Campaigns. The Port of

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[85] King, Biggs, and Criner, CMH Pub 69-7-1, 182.

[86] John Bird Jr., "North African Campaign: Case Study," (Study project, U.S. Army War College, Carlisle Barracks, PA, 1991), 51, https://apps.dtic.mil/dtic/tr/fulltext/u2/a233870.pdf.

Oran went on to be used as a port for the out loading of cargo for American troops.[87] The Port of Bizerte became the primary port of embarkation for follow on forces in the assaults on Sicily and mainland Italy.[88]

Immediately following the liberation of North Africa, Allies' efforts shifted towards the island of Sicily where the Allied Forces landed on July 10, 1943.[89] It was the most advantageous location to assault from North Africa in pursuit of war objectives. It served as a foothold into the southernmost part of the European Theater of operations by way of the Italian peninsula. The campaign in Sicily was the opening event for the main operation of the Italian mainland campaign. American and Allied forces faced heavy resistance from a battle-hardened enemy while plagued by adverse weather and hostile terrain.

During the Sicilian Campaign, Allied forces faced several logistical challenges due to terrain, which in some cases was considered undesirable, due to its high surf, dunes, and lack of suitable exits. The terrain in Sicily challenged Allied over-the-shore capabilities and threatened the success of providing support to advancing forces. Additionally, the anticipated throughput was severely constrained because several beaches were closed due to enemy shelling. The main challenge in Sicily was the establishment of a viable logistics system once forces made it ashore. Initially, logistical

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[87] Bykofsky and Larson, CMH Pub 10-21, 157.

[88] Robert Coakley and Richard Leighton, Center of Military History Publication (CMH Pub) 1-6, *United States Army in World War II: Global Logistics and Strategy 1943-1945* (Washington, DC: U.S. Government Printing Office, 1989), 159, https://history.army.mil/html/books/001/1-6/CMH_Pub_1-6.pdf.

[89] Bykofsky and Larson, CMH Pub 10-21, 196.

systems were disorganized, and supplies were left piled high on the beach. There was also a problem with heavy congestion on the beaches due to lack of movement control. Supplies, cargo, and equipment were downloaded and discarded faster than could be claimed or allocated. However, there were many factors that contributed to this that further exacerbated the situation. There was a lack of experienced vehicle transportation or experienced personnel to handle a logistics challenge of this magnitude. In addition, there was a shortage of personnel for port clearance and unloading cargo, which was often impacted by adverse weather conditions.[90] Finally, the ports were not designed to handle the logistical capacity required for Seventh Army, and as such required maintenance to keep up with operations.

By D + 4 weather conditions improved, greatly contributing to a better operating logistics environment. In addition, several other ports such as Licata and Porto Empedocles had been taken by Allied forces, increasing capacity for inbound movement of personnel, equipment, and cargo. The 382nd Port Battalion capitalized on these conditions at Licata, performing movement control operations for transfer of food, fuel, and ammunition shipments from the Landing Ship Tank (LST) vessels. The movement control operations of the 382nd were greatly effective and contributed to the transportation of over 66,285 personnel, 121,900 tons of cargo, and 7,396 vehicles into the theater of operations.[91]

[90] Bykofsky and Larson, CMH Pub 10-21, 197.

[91] Bykofsky and Larson, CMH Pub 10-21, 198.

Due to the harsh geography of Sicily, rail and ground transport were the primary modes of transportation for troops, material, and equipment. However, the railway system was heavily damaged and ineffective from the initial assault, fighting, and bombings. In addition, trains and shipments were critically delayed due to a lack of water and other requirements needed to return the locomotives to a functioning condition.

Allied logistics planners had anticipated use of rail in their forecast for the campaign and identified rail capability as a critical priority for sustainment success. The 727th Railway Operating Battalion sent an advanced party that landed at Licata on 12 July 1943, and by the end of the month, the remainder of the battalion arrived. The unit had the valuable experience of supporting the North Africa campaign from Ouled Rahmoun to Tebessa and leveraged the experience to confront challenges in Sicily. In some instances, the 727th utilized the exact methods and solutions from North Africa and implemented them in Sicily. The battalion took several approaches to mitigate logistical challenges. Its first action was the movement of supplies and equipment that had been awaiting transport for 3rd Infantry Division. This enabled continuation from Sicily into the Italian peninsula. The 727th sought out the help and support of local Italian train crews and engineers to restore the rail in the most urgent manner. In less than two days from initial arrival the advanced party was able to move over 400 tons to the division.[92] As the remainder of the 727th arrived, the leadership continued to assess the situation and took the important step of task organizing subordinate units as the situation and mission dictated. Though the 727th had a transportation company, it did not have a section

[92] Bykofsky and Larson, CMH Pub 10-21, 200.

dedicated to movement control. It had to organize its movement control section from its transportation companies, company, and platoon headquarters.[93] They contracted local nationals with prior experience in the rail industry to augment their forces. The battalion also organized its movement control personnel and created strategic movement and transfer points. It placed key personnel and contracted support in place to coordinate, organize, and push equipment and supplies out to the force.

The impact of movement control in rail operations can be found in situational reports during that time. In the areas of Gela and Licata, between 12 July to 1 September 1943, a total of 112,406 tons moved by rail. These rail movements directly contributed to the success of the initial Allied assaults in the southern portion of the island by extending operational reach. As Allied troops advanced along the coastline, logistical support conducted parallel operations in support, moving east from Palermo and San Stefano. In a shorter period, from July 28th to September 1st, 61,617 tons were moved by rail. Despite the short time frame, these moves were equally significant as those in Gela and Licata because it was the most tons moved on a single rail network.[94]

There was an urgent requirement for movement control and highway regulation in order to ensure the uninterrupted flow of troops and supplies, a challenging transportation environment. Military transport had to contend with dense civilian traffic in heavily populated areas. Locals carried on with the remaining parts of their daily lives and

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[93] United States War Department, Field Manual (FM) 55-55, *Railway Operating Battalion* (Washington, DC: U.S. Government Printing Office, 1944), 37, https://archive.org/details/FM55-55.

[94] Bykofsky and Larson, CMH Pub 10-21, 200.

routines, using carts and bicycles to get around. This interfered with allied forces' ability to freely move throughout supply routes. However, there were other challenges that placed a stringent burden on highway operations. These challenges included a shortage of drivers in quartermaster supply units and the lack of suitable roads that went through mountainous and rugged terrain. Problems such as these and various others were further exacerbated by the lack of route markings and areawide blackouts. In response during July 1943, the U.S. Army chose the 6623rd Regulating Company to address the problem of movement control highway regulation. The company's advanced party landed just east of Licata beach and immediately setup operations at the Seventh Army Headquarters to establish and refine main supply routes. The 6623rd took an approach which resembles current movement control operations. The unit split into three separate movement control sections. The main headquarters section conducted highway regulation and the remaining two sections augmented the Highway Division under the 7th Army's G-4 Transportation Branch staff and operations.[95]

The G-4 Highway Division moved into Palermo immediately after its fall and established a traffic circulation plan, standard operating procedures, and routes. With augmentation from elements of the 6623rd, the division acted as an operational arm of the base section, and organized motor transport convoys and implemented its plans and schedules. The unit created a more efficient system of movement by centralizing the movement control of all vehicles, including those of quartermaster supply units that were under the operational control or attached to the U.S. Seventh Army. The Highway

[95] Bykofsky and Larson, CMH Pub 10-21, 201.

Division drafted and implemented a set of regulations specifically for military operations conducted in civilian traffic. This regulation was issued and developed to address the issue of local national interference on main supply routes. The primary goal was to reduce military liability, civilian deaths and accidents, and the risk of interference with local nationals' daily travel routines. The 6623rd addressed the problem with route familiarity, markings, and traffic blackouts based on specific areas and times, by forming what is known today as highway regulation teams. The unit tasked three soldiers to patrol throughout the city's road network and direct vehicles and convoys to their destination. The 6623rd's traffic management operations greatly reduced distribution turnaround times and lessened congestion which eased local national concerns. Overall, the highway operations yielded the transportation of 230 trucks and 4,641 tons of supplies and equipment, a 479 percent increase from the first day of operations. The impacts of these movement control operations exceeded the initial expectations of the Transportation Corps and theater leadership.[96]

Operations on mainland Italy proved to be just as challenging as those in Sicily. There were 23 days between the end of major combat operations in Sicily and the beginning of Operation AVALANCHE. There were several challenges to logistics operations of the initial invasion in the mainland that had operational and transportation consequences. The 15th Army Group in the Italian Theater continued to face the challenge of being considered a secondary priority to the buildup of forces in the U.K. Even as the operation proceeded, some units with the highest level of readiness were

[96] Bykofsky and Larson, CMH Pub 10-21, 201.

continually shifted around and reassigned on the battlefield as command priorities changed.

Logistics support elements such as port opening and movement control teams also had to contend with issue of enemy operations. Most enemy defense positions were established from actions that occurred from January through March 1944.[97] Allied forces landed at a beachhead in Anzio and met stiff resistance from the German forces that were enveloped by the Allied position. Field Marshal Albert Kesselring commanded German troops in the area.[98] He believed protecting the Mediterranean lines of communication was the center of gravity for the allied southern Europe Campaign.[99] He was intent on maintaining his position in Italy. The German forces established defensive positions, held their ground, and fought with such determined resistance that by March, the battle was in a full stalemate. The Allies were both at a tactical and logistical disadvantage due to the terrain, landing areas, and distances. The adjacent areas were characterized by precipitous mountain terrain which abutted the coastal plains. The constraining terrain was very tight and undulating, further restricting the freedom of movement.

In the early parts of the war on the Italian peninsula, highway transportation was the only mode of transportation available. The Italian battlefield lacked a movement control capability with centralized control of transportation assets. BG Ralph Tate, the

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[97] King, Biggs, and Criner, CMH Pub 69-7-1, 191.

[98] Ibid., 189.

[99] David Dworak, "Victory's Foundation: US Logistical Support of the Allied Mediterranean Campaign, 1942-1945," (Dissertation, Maxwell School of Citizenship and Public Affairs, Syracuse, NY, 2012), 127, https://surface.syr.edu/cgi/viewcontent.cgi?article=1094&context=hst_etd.

Fifth Army G-4, recognized the shortfall and assumed responsibility for this challenge by using his transportation section to initiate the centralization effort. The transportation section operated much in the manner of the highway regulation teams of today. This was a situation where a higher headquarters had to take on more of an ad hoc approach to temporarily fill a capability gap. The transportation section was used to integrate all modes to execute port clearance and onward movement. It also extended its operations in the rear area by coordinating, scheduling, and prioritizing military police, and convoy operations.[100]

Due to the many factors involved with highway operations and the complexity of the Italian geography and infrastructure, dedicated movement control elements for ground movements and highway regulation were necessary for the Italian Campaign. Mainland Italy's geography and infrastructure contributed to a very limited highway network that was a major constraint for the distribution system. At its normal operating tempo during the campaign, there was an average of 12,000 vehicles per day on the two-lane highway.[101] The mountainous terrain, road destruction, and enemy actions on targeted objectives only served to exacerbate the problem the inevitable interruptions of traffic.

The Fifth Army's transportation section reorganized to meet the challenges of the operational environment. Doing so consolidated control of all non-organic transportation

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[100] King, Biggs, and Criner, CMH Pub 69-7-1, 195.

[101] Headquarters, 15th Army Group Italy, *A Military Encyclopedia: Based on Operations in Italian Campaigns 1943 – 1945* (Washington D.C: Headquarters Department of the Army, 1945), 477, https://archive.org/details/AMilitaryEncyclopediaBasedOnOperationsInTheItalianCampaigns1943-1945.

and ground movements. Its transportation officer task organized his section to form three operational subdivisions: freight, movement control, and traffic engineer; all of which were answerable to him. The freight division coordinated the movement of troops and different classes of supply through various nodes such as water, rail, and ground. The traffic engineer division surveyed, developed, and planned road networks. While each of these divisions had a role in movement control, it was the movement control division that had a direct impact on the regulation, control, and movement over the Army road networks. The traffic regulation group of 22 officers and 117 enlisted soldiers served as an enabling force to the movement control division.[102] It provided several capabilities including an operations section, field installation of traffic control points, freight personnel for railheads, and for what today is called reception, staging, integration, and onward movement, RSO&I.

After forming the appropriate sections, the movement control division addressed the challenges facing highway movement. First, it developed criteria, implemented controls, and required approval for movement. This included approval for all convoys and any moves with excess dimensions over 60 feet in length, 10 feet in width, and rates of speed under 15 mile per hour speed. Additionally, movements of 10 or more vehicles in a point-to-point move required approval and were capped at four moves per hour.[103]

The movement control division established and implemented priorities of movement, prioritizing supply. These priorities did not conflict with the mission

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[102] Ibid.

[103] Headquarters, 15th Army Group Italy, *A Military Encyclopedia*, 477.

commander's plans and most of the time, they ran parallel in support. As a check on this arrangement, at any point the G-3 could intervene and change the priority of transport, particularly for troop movements or to resolve critical supply requirements.[104] Maintaining close coordination with the G-3 and G-4 was paramount to conducting movement control for ground operations. To synchronize movements, the movement control division was regularly informed and involved in the common operating picture, planning, and tactical updates. As a result of this arrangement, this allowed the movement control division to learn from past operations, react to current situations, and prepare for future operations.

The movement control division also coordinated with protection assets, such as military police, to determine the requirements for their presence at key nodes for security and posts along routes. It determined requirements by taking meticulous notes and collecting data to optimize distribution and movement. The division maintained a daily situational report which was constantly updated and distributed daily. This report provided information to the transportation officer, detailing the number of outbound vehicles and convoys, to include late departures and delinquencies.[105] It used highway regulators to maintain accurate counts on the number of vehicles transiting the supply routes and secondary roads. It tracked both civilian and military traffic to accommodate the local population and conduct route planning, factoring daily civilian routines.

[104] Ibid., 478.

[105] Headquarters, 15th Army Group Italy, *A Military Encyclopedia*, 478.

On 15 August 1944, the Mediterranean Chief of Transportation MG Stewart referred to the backlog of vessels in theater as "embarrassingly large."[106] Of the 29 operational berths, 22 were assigned for operational loading in support of the war effort. Though this may seem like an advantage, it still presented a shortfall in port capacity. Upon the transportation units' arrival, only three of the total 72 berths were operational due to the heavy bombings that occurred.[107] Naples was one of the most important strategic port locations throughout the Italian campaign but presented some unique challenges and growing burdens. In the early parts of 1944, the area experienced an increased out loading for amphibious assaults. This resulted in the frequent curtailment of normal port discharge operations.

On September 9, 1943, an advanced element of the 6th Port and the 389th Port Battalion arrived at Salerno to conduct follow on movement and conduct movement control operations at the Port of Naples. The remainder of the 6th Port arrived on October 1st and linked up with the advanced party. Like several of the units in theater, the unit had a wealth of experience from its previous operations in North Africa. Though Naples had similar capabilities as the Port of Casablanca, where the unit previously operated, Naples provided additional challenges of scale as it was triple the size.[108]

It was essential that maximum cargo discharge be a priority to allow for ships to be flexible and available for taskings in other part of the theater. The 6th Port decided the

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[106] Bykofsky and Larson, CMH Pub 10-21, 208.

[107] Dworak, "Victory's Foundation," 290.

[108] Dworak, "Victory's Foundation," 276.

best option to prevent port congestion during the out-loading for Operation DRAGOON was to allow only mission essential items. In addition, they also coordinated for vessel diversions to other ports. The 6th Port Battalion also enlisted the help of hundreds of locals as contract stevedore labor to augment the transfer of equipment and cargo in multimodal operations.[109]

The 6th Port's contracting of local civilians addressed the capability gap for the transfer from the port to rail, with the unit being the movement control coordinator. This effort led to the average transfer of 8,396 tons of coal from ships to railcars. This greatly reduced the time required to transfer from weeks to days and countered the Germans efforts to destroy Salerno's stockpiles of coal. Ultimately, the increased throughput contributed to the seamless, consistent resupply and distribution to the front lines. The efforts in Italy also exceeded the estimates of the War Department by four times and had twice the amount of throughput that occurred before the war started. Within 24 hours of initial operations, over 5,380 tons were received, organized, and transported through the port and within six months that number would grow to 2,375,000 tons. As the situation improved and conditions stabilized, a consistent system of support developed, growing the capacity of the port operations to support the U.S. Fifth and Eighth Armies.[110]

On 15 August 1944, U.S. forces landed on the French Rivera under the code names Operation Dragoon.[111] This action served the purpose of supporting Eisenhower's

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[109] Ibid., 293.

[110] Dworak, "Victory's Foundation," 291.

[111] Ibid., 371.

main effort. This force consisted of the U.S. Seventh Army and the First French Army. The First French Army had a total of 522,000 troops of which 14 percent was serving in support roles, and it also included 110,000 vehicles.[112] It would operate in subordinate organizations of three division task forces. The French task was to make a series of amphibious assaults on beaches and ports in Toulon, Nice, and Marseille, then continue north of the Rhone Valley and augment the U.S. Forces with combat power and support for the advance east.[113]

The U.S. and Allied forces were successful in their rapid advance, covering over 330 miles. After a month of operations, the invading forces created the 6th Army Group. Parallel efforts and coordination were occurring at the Mediterranean Theater of Operation at Lyon, France to support the Allied forces. This support further extended to the front lines with the establishment of advanced and base sections.[114]

The operation was a logistical calculation by Eisenhower and was heavily based on assumptions regarding port access and clearance, and other elements of movement control. He understood the need to secure ports in France to rapidly deploy forces into the European Theater. His goal was to increase the throughput of the European Theater from the south to bring in an additional 40 to 60 divisions from the United States along with

[112] Bykofsky and Larson, CMH Pub 10-21, 291.

[113] King, Biggs, and Criner, CMH Pub 69-7-1, 197.

[114] King, Biggs, and Criner, CMH Pub 69-7-1, 197.

additional sustainment support. Eisenhower's focus on the southern ports was because they offered was high throughput at low risk.[115]

The primary challenge for highway operations for the Southern France operation was the increased requirement for truck capacity and the additional fuel consumption requirements. The Seventh Army's Transportation Officer COL Charles Tank took similar action as the Fifth Army's G-4 BG Ralph Tate, in establishing an *ad hoc* organization to fill a capability gap requirement. The Continental Base Section established a movement control office. It had the responsibility under the transportation section's highway division, to plan, route, schedule, and control personnel and cargo over lines of communications. First, it consolidated both U.S. and French military convoy operations under one overarching command and control structure. These convoys were of particular importance since they had a major role in providing logistics support such as supplies and rations. The movement control office ensured that the convoys under their control were scheduled, routed, and rerouted to the most optimal road networks and conditions. This action ultimately contributed the alleviation of the halt to the Seventh Army's advance.[116]

During August 29, 1944, the 703rd Railway Grand Division and the 713th Railway Operating Battalion arrived in Marseille. As this occurred, the 1st Military Railway Service sent its advanced party to Lyon. This arrangement remained in place until early in the following year when the European Theater of Operations

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[115] Dworak, "Victory's Foundation," 380.

[116] King, Biggs, and Criner, CMH Pub 69-7-1, 201.

communication zone assumed control and jurisdiction. It was the headquarters sections of the Grand Divisions that performed movement control.

Though the Germans left much of the rail system in place after withdrawal, in locations such as Marseille, rail facilities were heavily damaged. This caused major disorganized and unmarked piling of equipment and cargo. The Army's rail maintenance units made repairs as quickly as possible to support continued operations. Efforts were made to contract French local nationals who had experience in rail operations, repair, and movement control. This augmented support, greatly increased the level of throughput to the warfighters.

As early as September 1944, the railway battalion established movement boards to establish priorities of movement and support. These movement boards involved all stakeholders or representatives and provided a level of coordination and understanding between each other. This venue for coordinating movements provided an efficient environment of collaboration that optimized transportation support operations. To address the primary physical constraint of rail gaps, the battalion established temporary transfer points for trucks, trailers, and railcars. These transfer points allowed for shipments to be transferred to trucks and railcars in locations where rail lines and roads were damaged. Eventually, this transfer method became obsolete as rail lines and roads were restored to an operational capacity. Though very limited, there were several significant impacts of these rail movement control operations on the overall war. In one month, transporters increased the movement of cargo by 281 percent. By October, rail shipping processing and capacity was 8,350 tons per day, approximately four cargo ships worth of supplies

and equipment. This represented a 67 percent increase from the beginning of operations when rail capacities were severely limited.[117]

The movement control rail operations contributed significantly to support of the U.S. Seventh Army's and Allied forces' advance across France.[118] It opened and provided a main supply route that became the primary lifeline for the 6th Army Group. The greatest impact that was made was its contributions to the southern campaign that ultimately shortened the war in Europe.

The overall impact of the movement control actions in Italy and southern France supported over 1.2 million US and allied troops. This enabled the increased flow of combat forces and support in the theater of operations.[119] The operating environment, and challenges in the port at Naples were described as almost identical to a port in Tunisia, the only difference being the size of the ports. The experiences gained contributed to the increased performance that took place in Italy. MG Stewart stated, because of the experience they gained early on, they "had become pretty good" for future follow-on operations.[120] North Africa was a smaller theater of operations that was key to influencing the outcome of the overall effort.

Though the Mediterranean campaign did encompass some parts of Europe, for the purposes of the transportation analysis, it should always remain in a category of its own.

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[117] Bykofsky and Larson, CMH Pub 10-21, 298.

[118] Dworak, "Victory's Foundation," 389.

[119] Dworak, "Victory's Foundation," 24.

[120] Stewart interview.

The Mediterranean Theater of Operations was a secondary theater which applied pressure on Axis forces. These efforts ultimately liberated North Africa and Italy, making them prime locations for launching air and beach attacks. The movement control operations executed in this theater supported the efforts of advance. The overall impact of the movement control actions in the Mediterranean Theater of Operations supported over 1.2 million US and allied troops. The actions enabled the increased flow of more forces and support, ultimately speeding up the war effort to an end.[121]

The movement control requirements of North Africa and Italy far outstripped the predicted mission load. Transporters and logisticians recognized the problems and worked innovative solutions which were applied to successive campaigns. The movement control efforts enabled the generation of combat power by overcoming the potential bottlenecks at ports, beaches, and highways that had initially overwhelmed theater assets and threatened to derail operations

[121] Dworak, "Victory's Foundation," 24.

# CHAPTER 4

# INVASION OF NORMANDY

Movement control operations for Operation Overlord the Allied invasion of France required support and very close coordination with Great Britain. This was imperative because the continental U.S. and U.K. were the only major location where U.S. personnel, equipment, supplies, and emergency shipments were positioned.[122] Both nations worked in tandem to plan and ensure clear lines of communication and logistical support from the point of manufacture to the front line.

Both U.S. and British military and civilian leaders placed civil considerations as a primary concern in their planning. The British needed to sustain its civil operations, infrastructure, population, and war effort, an estimated at 25 million tons per year. Therefore, American military cargo was only a fraction of the total imports, and its activity was required not allowed to interfere with the daily routines and operations of the population.[123]

During inbound port operations, movement control units had to contend with the challenges of labor shortages and restrictions, training, and transportation infrastructure. Support for the war effort through military service had taken its toll on the available workforce and on the economy. The military had taken many of the working age,

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[122] King, Biggs, and Criner, CMH Pub 69-7-1, 254.

[123] Roland Ruppenthal, Center of Military History Publication (CMH Pub) 7-2-1, *The European Theater of Operations: Logistical Support of the Armies,* vol. 1, *May 1941-September 1944* (Washington, DC: U.S. Government Printing Office, 1995), 148, https://history.army.mil/html/books/007/7-2-1/CMH_Pub_7-2-1.pdf.

healthier population of men and some ports reported the average age of workers at 52.[124] The U.S. commander at the Bristol Channel port took steps to mitigate and address the labor shortage. He used an anchored ship at Penarth and coordinated with the Transportation Corps to train fifty soldiers in unloading methods every two weeks. The British workers unions also impacted transportation operations. They restricted the use of military labor on ports until times when civilian workers were not available. However, by the summer of 1943, cargo shipments significantly increased, and the union restrictions were lifted.

In the U.K., rail was the primary node of transportation for moving personnel and cargo inland. Movement control faced the challenge of different operating procedures between the U.S. and British rails systems. In 1942, the European Theater of Operations Chief of Transportation, MG Frank Ross conducted a reconnaissance and assessment of British transportation nodes and facilities. He described the rail network and infrastructure as being so tiny the American presence would require a complete makeover and reorientation for its operational methods. From the U.S. perspective, the main issue with the British rail network was its inadequate capacity, headspace, and tunnel clearance. These factors significantly impacted transportation operations and the ability to move equipment such as tanks and other awkwardly shaped equipment.[125] The design of the British rail network also impeded the ability to efficiently transfer large volumes of equipment from ships to railcars. The difference in design was so significant by U.S.

[124] Ruppenthal, CMH Pub 7-2-1, 148.

[125] Ibid., 149.

standards that U.S. movement control troops and units found it almost impossible to move cargo by pallets, forklifts, or tractor trailers.[126]

MG Ross was selected by the Services of Supply commander MG John Lee. He was considered a high strung, energetic, and enthusiastic officer, had worked the railroad in his youth and service experience from World War One (WWI). When the U.S. entered WWII, he was serving as the Department of the Army's G-4, Transportation Branch as the Chief of Port and Water Section and planning his next assignment in the 10th Armored Division. However, when informed to serve as the chief of transportation, he was not enthusiastic about it but saw it as important.[127]

British port officials recommended to MG Ross that U.S. movement control soldiers maintain British rail standards and be absorbed into its transportation system. MG Ross objected to the integration and wanted to maintain a level of separation between U.S. and U.K. transportation methods and operations. He opted to train movement control personnel in the British rail transportation offices at the regional commands, to learn how to use American standards for movement control in the British system. [128] His reaction and resistance to the British's recommendation was based on some of lessons learned from previous operations in the Mediterranean Theater of Operations, especially North Africa. In fact, the first recommendation from the Operation TORCH after-action reports supporting G-4 was to avoid the integration of British and

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[126] Ruppenthal, CMH Pub 7-2-1, 147.

[127] Bykofsky and Larson, CMH Pub 10-21, 75.

[128] Ruppenthal, CMH Pub 7-2-1, 149.

American sustainment systems and processes wherever possible. In addition, the recommendation further justified separate, parallel systems for logistics support and command and control. These recommendations were in response to the vast differences in supply support systems between the two armies. American commanders concluded that the differences severely reduced efficiencies and further increased the complexities of existing challenges.[129]

Movement control also had an important role in operations at the U.S. depots in the U.K. U.S. logistics planners depended on the depots for the initial reception of supplies and equipment. The depots provided storage, intermediate staging, and increased port capacity. These functions were critical in reducing congestion and hazards and establishing an organized venue for allied support. Initially, they were under the direct control of the theater G-4. However, to decentralize Supply of Service branch operations, the depots were later assigned to the base sections in which they were geographically aligned. The chief quartermaster was delegated staff supervision over the general depots with authority to consolidate of all service requirements. The general depots handled the various classes of supply for multiple services, and the branch depots handled the various classes for one service and were under the technical supervision of the service chiefs.[130]

The Ashchurch Depot, located in the Bristol Channel Port area, was one of the key depots where movement control had a major impact on the buildup to Normandy.

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[129] Department of the Army, "Lessons of Operation Torch," (Compilation of reports, Department of the Army, Washington, DC, January 1943), 4, https://apps.dtic.mil/dtic/tr/fulltext/u2/a438192.pdf

[130] Ruppenthal, CMH Pub 7-2-1, 152.

The Bristol Channel port received most of the heavy equipment and supplies such as tanks, guns, and ammunition that was pushed into the European Theater of Operations from the U.S.[131] It was also the primary location for the movement of freight and the workers and soldiers specialized in its shipping, storage, and tracking. This made Ashchurch a prime location to quickly transfer equipment and commodities for follow on movement. One of the major challenges faced by movement control elements at the Ashchurch depot was its multifunctional activities. It was primarily used as a general depot to receive, store and issue equipment and supplies for the ordnance, quartermaster, signal, engineer, and chemical services. The ordnance section enjoyed a level of autonomy in the logistics arrangement. It performed movement control of ordnance supplies, special purpose vehicles and artillery, and sustainment level maintenance support equipment.[132] As operations progressed towards D-Day, the depots experienced a surge in operations. During the latter part of 1943, at the peak of operations, movement control units coordinated the transportation of an average 140,000 tons per month.[133]

[131] Ruppenthal, CMH Pub 7-2-1, 147.

[132] Ibid., 156.

[133] Ibid., 159.

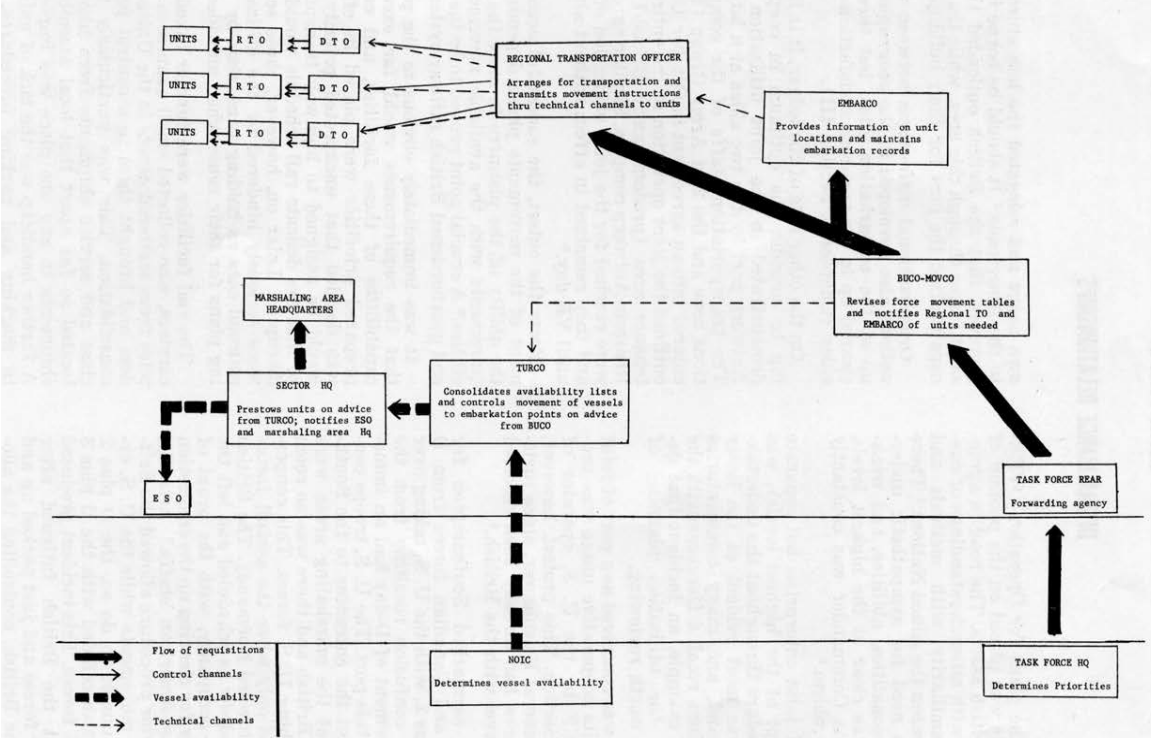


Figure 2. Buildup Control Structure

*Source:* The Transportation School, *Operation Overlord: An Historical Analysis,* Transportation School Monograph 3 (Fort Eustis, VA. The Transportation School, October 1955), 21, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/id/4860.

In the spring of 1944, Combined Forces Headquarters established a multinational, joint movement control organization - the Buildup Control Organization (BUCO). The BUCO, was not under the command and control of the Supreme Allied Commander. The organization was an Anglo-American organization under the command of British Brigadier G.C. Blacker. Brigadier Blacker did not have a command relationship with the Supreme Allied Headquarters. He remained under the operational control of British General Bernard Montgomery, commander of the 21st Army Group and answered to the component commanders on issues regarding the buildup of forces. The purpose was to provide a centralized movement control capability for follow-on movement of watercraft,

personnel, and vehicles to the ports of embarkation.[134] The organization supported the theater effort to make an efficient system for shipping and avoiding port congestion. The organization was a staff group of transportation representatives from each service component.[135] They coordinated movements through the allied naval commander, U.S. War Shipping Administration, the Ministry of Air, and Headquarters European Theater of Operations. Though a multinational, joint command, the British and American forces still maintained a degree of separation, which had become the norm instead of an official policy. The U.S. Staff was under the operational control of the 12th Army Group. Decisions and actions considered minor or of little to no impact to the priority of forces were retained by the staff, while impacting decisions were forwarded to the 12th Army Group.[136]

The joint leadership also established two subordinate executive agencies as the Movement Control (MOVCO) and the Turn Around Control (TURNCO). Movement Control tracked daily movements, unit ship allocations, and transmitted the information to the Southern Base Section headquarters. However, Turn Around Control worked in direct support to naval commanders to provide movement control for ships and aircraft.

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[134] The Transportation School, *Operation Overlord*, 9.

[135] Headquarters, United States Marine Corps (HQMC), Fleet Marine Force Reference Publication (FMFRP) 12-14, *Logistics in National Defense* (Washington, DC: U.S. Government Printing Office, 1989), 165, https://www.marines.mil/Portals/1/Publications/FMFRP%2012-14%20%20Logistics%20in%20the%20National%20Defense.pdf.

[136] The Transportation School, *Operation Overlord*, 9.

Its primary objective was to ensure unit arrivals at the designated ports of embarkation.[137]

The Southern Base Section also discovered a capability requirement for movement control in the buildup of forces. It established an embarkation control section (EMBARCO) to provide movement control for the troop movements from the staging areas to the seaports of embarkation. However, the embarkation control section suffered several setbacks and challenges that greatly hampered its operations. In the initial days of the invasion, personnel and supplies were not shipped on schedule due to issues with inaccurate manifests, unloading, organizing, and unsynchronized prioritizing of shipments. This ultimately had the negative impact of ships not completing their deliveries and pickups within their scheduled time. To further exacerbate the problem, many ships arrived in the wrong locations and personnel working the ports were not aware of the cargo for inbound shipments.[138]

Preparations for the deployment of Operation OVERLORD invading forces began on June 4, 1944, just two days before D-Day. In that two-day preparation window, movement control and deployment preparation operations enabled the loading of a total of 107,606 tons of cargo in support of invasion requirements.[139] The movement control process of the deployment of forces to Normandy was flawed from the beginning and throughout. The Southern Base Section was advised to maintain 25 percent availability in

[137] HQMC, FMFRP 12-14, 165.

[138] Ibid., 166.

[139] King, Biggs, and Criner, CMH Pub 69-7-1, 220.

the staging camp area in case such issues with disorganization and congestion occurred. However, the recommendation went unheeded and ignored. The original plan was based on priority lists developed and provided by the U.S. First Army followed by the U.S. Third Army. Initially, unit movements were closely monitored. However, an overlap in unit moves and priorities between the First and Third Army developed in the movement process.[140] Frequent changes in guidance and priorities from the Buildup Control Organization caused confusion and once the deployment process began it could not be reversed. The process involved movements coordinated through formal orders in which the deployment process began when the units arrived in the staging areas.[141] Units were called forward to deploy, sometimes on short notice, without any regard for their personnel or equipment readiness. Once units moved forward from the staging areas, they were immediately replaced by another unit. In the instance that there was a change in priorities of deployment, the deploying unit was held in the staging areas and the units with the higher priorities were processed for deployment.[142] This caused such a high level of congestion and pileup at the ports that the troops and cargo could not be loaded into available ships.[143] Chaos at the ports threatened to unhinge the deployment synchronization. To address this issue, the port movement control elements suspended priority loading and departure time requirements. Ships were loaded on a first come-first

[140] The Transportation School, *Operation Overlord*, 17.

[141] King, Biggs, and Criner, CMH Pub 69-7-1, 219.

[142] Ruppenthal, CMH Pub 7-2-1, 422.

[143] HQMC, FMFRP 12-14, 166.

serve basis and units were immediately shipped out upon availability. Regardless of the many setbacks and challenges presented, because of the movement control operations, in June, 317,765 soldiers were transported to Normandy.[144]

Movement control of supplies and equipment in Operation Overlord was accomplished in four phases, D-Day through D + 8, D + 8 to D +21, D+21 to D+41 and D+41 to D+90. The first phase involved the prepositioning and storage of cargo and equipment for combat units in the initial advance. Phase two involved the loading of sustainment packages onto various inbound and outbound watercraft vessels redundant that would support the theater of operations. Phase three involved the loading of maintenance packages onto outbound watercraft from preconfigured packages in the U.S. and U.K. Finally, Phase four, involved the transition from having two primary sources of stockages in the U.S and U.K. to a total dependency on shipments directly from the U.S.[145] This precise planning was also the result of lessons learned and recommendations primarily from Operation TORCH. The recommendation called for logistics soldiers to be embedded with invading combat units. The embedded soldiers needed to be familiar with U.S. equipment and organizations to perform the movement control and organize the beach according to priorities of effort. At the port of embarkation, troops, equipment, and supplies would be loaded according to the priorities required upon arrival at the destinations.[146] The European Theater's adherence to these recommendations avoided the

[144] King, Biggs, and Criner, CMH Pub 69-7-1, 220.

[145] Ibid., 254.

[146] Department of the Army, "Lessons of Operation Torch," 6.

errors from Operation Torch where only combat forces were loaded in the first wave, limiting the soldiers' ability to sustain themselves beyond a 10-mile radius from the beach landing.[147]

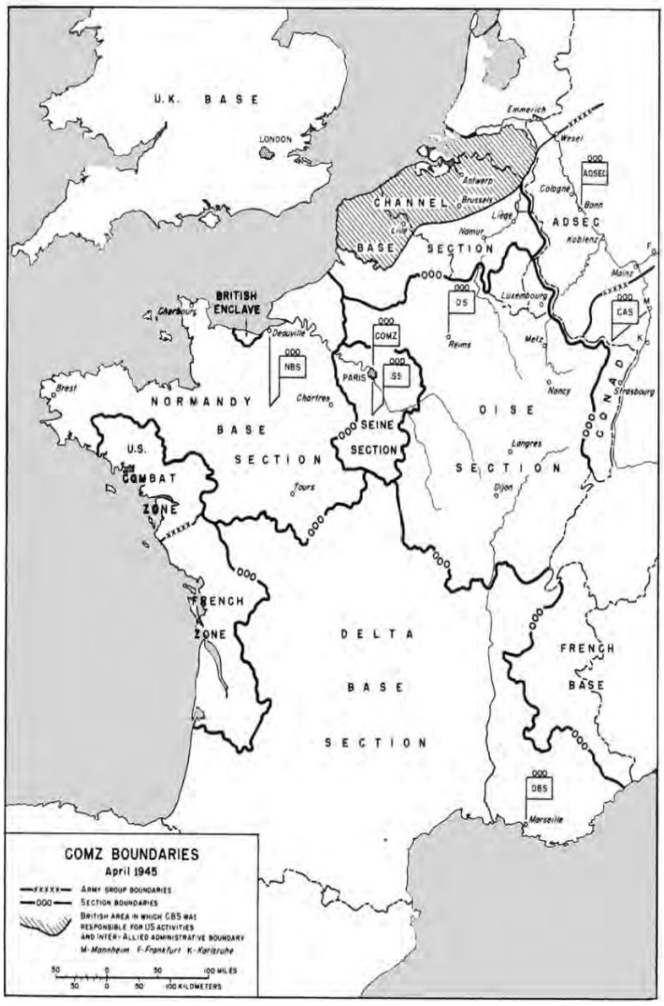


Figure 3. Communication Zone Boundaries

*Source:* Roland Ruppenthal, Center of Military History Publication 7-2-1, *The European Theater of Operations: Logistical Support of the Armies,* vol. 1, *May 1941-September 1944* (Washington, DC: U.S. Government Printing Office, 1995), 381, https://history.army.mil/html/books/007/7-2-1/CMH_Pub_7-2-1.pdf.

[147] Dworak, "Victory's Foundation," 155.

Although the Allies made progress in Operation Overlord, from a logistical aspect, initial plans did not occur as desired. First, plans for the use of the port at Cherbourg were frustrated because it was not captured, secured, or opened during the time that that had be anticipated. West of Paris, the rail system had been damaged to a point that it did not operate at a capacity adequate to support any major unit distribution. It was almost a year before the rail system was repaired to the point of mission capable and able to support major units and troop movements. This greatly impacted the combat units' ability to receive logistics support in a timely manner. By August of 1944, Allied forces had rapidly advanced east and outrun their supply lines. Their supply lines stretched to over 200 miles, placing a great burden on its supply depots and transportation assets. As depots became swollen with cargo that could not be expeditiously moved, they were overwhelmed, Army leaders became increasingly aware of the lack of movement coordination.[148]. The communications zone G-4 worsened the fragmented movement control structure by randomly intervening in movement control operations without any planning or coordination. The advanced section commanders performed their own level of movement control within their operating areas and did not conduct any cross coordination, communication or planning with others.[149] The logisticians were fighting separate campaigns that lacked the efficiencies of collaboration.

The Chief of Transportation developed a plan to make his office responsible for all continental programmed movements. The plan involved the movement control of

[148] King, Biggs, and Criner, CMH Pub 69-7-1, 254.

[149] Bykofsky and Larson, CMH Pub 10-21, 325.

ground transportation from ports and depots in support of the field armies and between depots in the communication zone. However, the communication zone G-4 denied the plan and following the invasion of Normandy, the delineation between the roles of the chief of transportation and the communication zone G-4 became unclear. The complexities of the situation rendered MG Ross temporarily ineffective in his efforts to provide support to theater transportation operations. The situation was eventually overcome through the intervention of MG Charles Gross, the U.S. Army Chief of Transportation in Washington DC.[150] The Chief of Transportation received limited authority to supervise the technical aspects of theater movement. The G-4 was given overall authority for the publishing of movement orders and the delegation of certain controls to commanders for movements throughout its area of operations.[151]

To address the challenges of movement control in this operation, the Army employed the regulating stations, one of the precursor organizations to today's movement control units. The Transportation Corps was not in favor of sending regulating stations. However, its nonoccurrence was overridden by the 1st Army Group that believed there would be a requirement for reception, staging, onward movement, and integration.[152] The regulating stations were ultimately stationed and assigned to the communication zone. Though they were correctly positioned near the rear boundary of the area of operations,

[150] Wardlow, CMH Pub 10-19, 88.

[151] King, Biggs, and Criner, CMH Pub 69-7-1, 254.

[152] Moses et al., "The Mechanics of Supply in Fast Moving Situations," 45.

the communication zone having operational control over them was a departure from regulatory guidance.[153]

The command-and-control structure for the regulating stations on the European Theater Operations was a departure from the doctrine of the time, FM-100. The Army Field Service Regulation FM 100-10 v.1943 stated that the regulating stations were assigned to the theater commander who may also assign regulating stations to provide movement control at aerial ports as well.[154] However, after the Department of the Army Headquarters decided to employ the regulating stations, there was still disagreement on the command-and-control structure for the regulating stations and attachments. The primary concern was what would be the appropriate organizations to exercise operational or tactical control over the regulating station or an organization exercise both. Some recommendations included placing the regulating stations under the operational control of the 12th Army Group Headquarters since the commander was also the commander of the ground force. However, the 12th Army Group objected and noted it did not have the organizational structure to support the regulating stations or authority to over the communication zone. Instead, the Army Group insisted they should be under the Headquarters, Supply of Services in the communication zone. However, regulating stations needed to be able to receive all required information to control movements. Therefore, the regulating stations were only established in the advanced section,

[153] War Department, FM 100-10, 40.

[154] Ibid., 41.

communication zone, and listed under the commanding general of the advanced section, communication zone.[155]

On August 1, 1944, the 24th Regulating Station was tasked to support the Third Army. Simultaneously, the 25th Regulating Station was tasked to support the First Army.[156] As combat forces advanced on their objectives and the need for movement control expanded, there was a growing requirement for an additional regulating station.

One of the primary challenges of regulating stations was lack of training. Unlike previously mentioned units, they did not have previous technical or tactical experience in North Africa or other theaters of the war. In fact, these units had the minimum requirements to enter the war, only given a week to understand the overall mission and operational environment.

During the initial setup of the new regulating units, there was not a clear concept or expectation of their roles and responsibilities.[157] Initially, the regulating stations' operations were primarily based on methods improvisation and adaptation to circumstance. This became apparent within the first 60 days of their arrival. Even without a clear understanding of its operational role, by mere virtue of the organizational names, it was clear that the operations would involve the regulation of cargo, equipment, and personnel. However, during this initial phase, they were also challenged with performing operations with limited resources, personnel, and infrastructure. In addition, these

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[155] Moses et al., "The Mechanics of Supply in Fast Moving Situations," 47.

[156] Ibid., 49.

[157] Ibid.

challenges were further exacerbated by the lack of documentation required to track movements. This presented a special challenge because it placed the regulating stations in a position to try and determine the requirements for units without their input. It was impossible to determine the capacity of any transportation node and any estimates were riddled with inaccuracies.[158] On the other hand, the supported units had the opposite problem of locating their requirements that were specifically earmarked for them and their subordinate units. These problems had an overall impact on multimodal operations and transfers, ultimately resulting in a buildup of unorganized piles of supplies and equipment. Therefore, the regulating stations were initially rendered ineffective for the regulation of any ground or rail traffic and instead needed to focus on clearance rather than regulating.[159]

To address these challenges in an expedient manner, the regulating stations first addressed the piles of cargo that most needed to be organize and documented for clearance. The regulating stations first established criteria for those requirements that would be considered urgent priorities. In addition to this, they also developed and implemented priorities of movement to prevent congestion by keeping ships and trucks in a constant movement cycle. Next, it established and sent movement control teams to operate along the lines of communication to locate supplies and organize them by priority. These teams would serve the dual purpose of operating as a part of a broad courier network to address the lack of organic communications support. These teams

[158] Bykofsky and Larson, CMH Pub 10-21, 324.

[159] Moses et al., "The Mechanics of Supply in Fast Moving Situations," 49.

were dispersed to operate at all the various nodes, including air, sea, rail, and ground. While in operating at their assigned nodes they consolidated and organized equipment and supplies for movement. These teams did not remain stationary but instead shifted positions and rotated as the operational environment developed. The teams also used some of the lessons learned from the Southern Europe campaign and established traffic control points and main supply routes. These traffic control points also provided as much information as possible by maintaining running estimates and key locations for all classes of supply and services. This information was supplemented and gathered by the first-hand accounts and efforts of the movement control teams working at the traffic control points. They operated as highway regulators by physically traveling the routes leading to the key supply and service locations and making frequent records of their observations as well as any observations of convoy commanders. These observations were translated into real-time, updated information to provide the most accurate depiction of operational route conditions and information for movements. The regulating stations and their subordinate movement control teams also used this information to form its daily situational reports that were provided to the higher headquarters through the G-4.[160]

Unanticipated problems manifested in other parts of the war as operations progressed. By July 1944, only 94 of the planned 130 truck companies had arrived in Normandy.[161] However, by August the number of available vehicles proved to be sufficient for the short distance hauling required because the forces were still relatively

[160] Moses et al., "The Mechanics of Supply in Fast Moving Situations," 50.

[161] Ruppenthal, CMH Pub 7-2-1, 557.

close. The allied leadership quickly capitalized on the successes of Normandy and decided to advance eastward and cross the Seine River. This created a logistical problem because the pre-invasion timelines had not anticipated the speed of advance and the transportation capacity was inadequate for the requirements. To support the effort, transportation planners estimated 100,000 tons of various classes of supply, excluding bulk fuel, would need to be transported to the Chartes-La Loupe-Dreux Triangle by September 1st. This estimate assumed that 18 percent could move by rail leaving the remaining 82,000 to be transported by motor transport.[162]

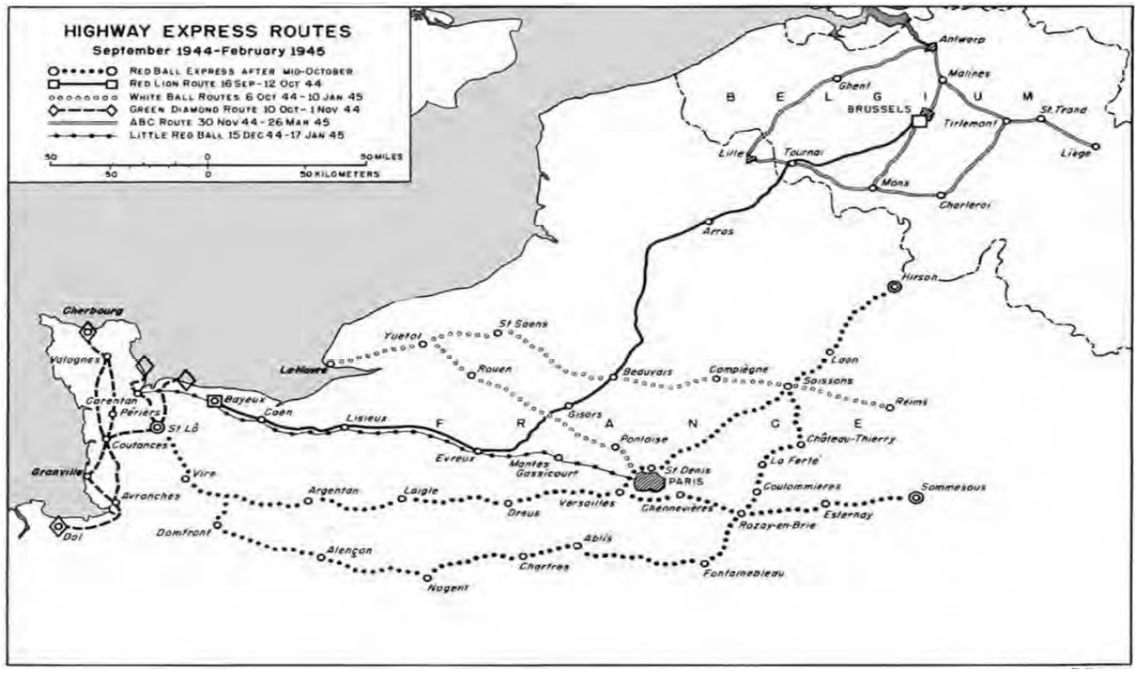


Figure 4. Red Ball Express Routes

*Source:* Roland Ruppenthal, Center of Military History Publication 7-2-1, *The European Theater of Operations: Logistical Support of the Armies,* vol. 1, *May 1941-September 1944* (Washington, DC: U.S. Government Printing Office, 1995), 136, https://history.army.mil/html/books/007/7-2-1/CMH_Pub_7-2-1.pdf.

[162] Ruppenthal, CMH Pub 7-2-1, 558.

Transportation planners addressed this shortfall by establishing the Red Ball Express, an aggressive, 24-hour convoy operation. The Advanced Section (ADSEC) accepted the assignment and the Motor Transport Service, under the command of COL Loren Ayers, provided movement control and supervision.[163] The Motor Transport Brigade, under the command of COL Clarence Richmond, had operational control of the truck companies. Under this arrangement, the Services of Supply provided the cargo, and the Normandy Base Section had responsibility to load it. Operations began August 25, 1944. The route extended from St. Lo to La Loupe Dreux Chartes Triangle and designated a restricted road to enable uninterrupted flow. The northern road was used for outbound loaded convoys while the southern road was used for empty inbound convoys.[164] Movement control elements operated throughout the route to provide highway regulation and traffic control. At the traffic control points, convoys were checked, manifested, and briefed on highway conditions and regulations.[165] The operations were conducted with the support of the military police to control and direct military traffic, French agencies to deal with civil matters, and ordnance teams to provide onsite maintenance.[166]

The Red Ball Express was extended past its original date of September 5th. To further support the advance east, transportation planners sought to shorten the hauling

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[163] King, Biggs, and Criner, CMH Pub 69-7-1, 233.

[164] Bykofsky and Larson, CMH Pub 10-21, 331.

[165] Ibid., 332.

[166] Ibid., 333.

distance. These phase two operations began on September 27. The Advanced Section established a rail node and transfer point in Paris where cargo was downloaded from trucks and transferred to railcars. This operation depended on both U.S. soldiers and local French nationals for labor and support.[167]

Though movement control operations on the Red Ball Express were planned, organized, and regulated, it faced several challenges from internal and external sources. Though movement control received military support for highway regulation, the manning requirements were never adequate to police the route. Elements from the First and Third Army and the Ninth Air Force often passed through the route without authorization or clearance, resulting in operational interference. In other instances, field armies habitually diverted convoys to alternate and incorrect delivery points. This resulted in convoys sometimes passing their original destinations by more than 100 miles, increasing the convoys' turnaround times, and desynchronizing the movement enterprise.[168]

The Red Ball Express never had the capacity to provide sufficient support to the allied forces advance east mostly because the Transportation Corps never received its full allocation of assets. The operation missed its intended target of 75,000 tons delivered by September 1st and the human, equipment, and fiscal expense was more than anyone had anticipated.[169] Regardless of these challenges, the Red Ball Express reached a peak average transportation rate of 5,088 tons per day, and by the end of operations 412,193

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[167] Bykofsky and Larson, CMH Pub 10-21, 334.

[168] King, Biggs, and Criner, CMH Pub 69-7-1, 235.

[169] Bykofsky and Larson, CMH Pub 10-21, 335.

tons had been transported.[170] As railways were completed or repaired, and inland waterways became available, express highway routes had served their purpose and became less relevant in transportation operations. As a result, on November 16, 1944, the Red Ball Express was discontinued and scaled down from its status as a large-scale operation.

In September of 1944, rail operations became a primary mode of transportation in theater and special emphasis was placed on its sustainment. The regulating stations were once again tasked with providing movement control by coordinating movements of supplies and equipment to the field armies. The rail operations grew to such a magnitude that it required the involvement of three regulating stations, 24th, 25th and a provisional regulating station, created because there were not anymore available. The 24th supported the Third Army, the 25th supported the First Army, and the provisional regulating station supported the Ninth Army.[171]

The regulating stations established an effective system to address the problems of coordination between agencies, congestion, and confusion. These regulation stations established node centers at all rail heads, including at major locations such as Versailles, Paris and Verdun, France.[172] They also established transfer points in the army rear boundary to further support and augment the rail operations.[173] These transfer points also

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[170] Bykofsky and Larson, CMH Pub 10-21, 334.

[171] Moses et al., "The Mechanics of Supply in Fast Moving Situations," 51.

[172] Ibid., 49.

[173] Bykofsky and Larson, CMH Pub 10-21, 324.

addressed the issue of the lack of documentation, organization, and ownership. The regulating stations used the transfer points to perform the documentation mission by placing key personnel in positions to check and document inbound cargo. At transfer points, inbound trains were identified, inspected, and confirmed, then loads were transferred, forwarded, or rerouted.

Verdun had become a logistics hub and cargo had begun to come through via rail for the Ninth and Third Armies. The 24th Regulating Station and the G-4 Transportation section had to closely coordinate and work together to support the efforts. They tasked organized their personnel to form a movement control team to coordinate, document, and direct movements.[174]

By the end of the year, regulating teams were faced with another challenge when Third Army withdrew its personnel. This left a gap in the augmentation of movement control and manning by the G-4. This caused a shift in the operations that left the 24th Regulating Station responsible for regulating rail routing and diversions in addition to its existing requirements. In response, the 25th and Provisional Regulating Station made the unprecedented move of establishing forward regulating stations in strategic locations that provided the required support to combat forces. Another example of *ad hoc* innovation to meet critical mission requirements was in Longuyon, France. There, the forward regulating stations served as transfer points for both the Third and Ninth Armies. They would be points of reception, documentation and consolidation of equipment, materials, and reports. Some 100 miles north in Liege, Belgium, the forward regulating station

[174] Moses et al., "The Mechanics of Supply in Fast Moving Situations," 50.

would be providing movement control of inbound shipments from the Advance Section.[175]

The actions taken by movement control planners and units created an efficient, operational environment of regulated and controlled highway traffic. At the close of the war the average reception and storage capacity had increased to 68,333 tons per month.[176] These actions also led to the establishment and implementation of programmed movements that were developed by the Transportation Corps and approved by the G-4 monthly. In addition, the Chief of Transportation gained additional authority to exercise control over certain movements to deconflict scheduling and limit congestions as he deemed necessary.

Although there was very little guidance and understanding of the mission, the actions performed during this phase of operations set the standards for the future of movement control organizational operations. The regulating stations had to innovatively apply an unorthodox and unprecedented approach which would lay the foundation for what we know of today as a multimodal movement control unit. Operations in this phase validated the Army's requirement for the Transportation Corps, and further justified the need for it to have control over all military transportation.

The fighting on the European continent during WWII presented a series of logistical challenges that the Army had to solve in a very rapid manner. In the invasion of southern France and Italy, movement control elements competed with overcoming

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[175] Moses et al., "The Mechanics of Supply in Fast Moving Situations," 51.

[176] King, Biggs, and Criner, CMH Pub 69-7-1, 258.

terrain, enemy and mechanical factors, competencies, and failures. These all contributed to the friction that was faced with supporting the forward combat forces as they quickly advanced on their objectives, frequently advancing for ahead of anticipated rates of progress

Operation Overlord was one of the largest operations in WWII and the largest operation on the European continent. There is not any military operation in recorded history that can compare to the complexities and magnitude of both combat and logistics operations that occurred in this campaign. As shown in the previous paragraph, movement control had one of the smallest footprints in this campaign. However, the manifest consequences of the Transportation Corp's effort of movement control as a combat multiplier were felt throughout the theater just as the lack of its presence was felt even more. It was these operations that opened the lines of communications to support combat operations and allow for seamless logistics to occur throughout the war. The movement control elements overcame various challenges including lack of training, inclement weather, enemy attacks, and the lack of a clear and concise mission objective. While faced with adversity on several fronts, the movement control elements continued to push cargo, supplies and equipment in support of the combat operations. They quickly adapted to the ever-changing environment and situations, while also disregarding many of their own health and safety concerns. In some instances, they went to the extent of forming highway regulation teams and performing route reconnaissance for both inbound and outbound convoys, even with the potential of enemy forces. However, during this operation, it was unity of effort and the willingness of allied forces to support each the main objectives, even in some of the most controversial times.

# CHAPTER 5

# CONCLUSIONS AND RECOMMENDATIONS

The previous chapters provide insight into the impacts of movement control in WWII, and the challenges and adaptations required for success. As the Army transitions from 20 years of counterinsurgency combat operations, it is instructive to examine the relationship between movement control operations in WWII and future large-scale operations. The discussion must center on the impact movement control had on WWII and the lessons that were learned and implemented in future large-scale operations. Because of the anticipated scope of combat in large-scale combat operations against a peer competitor, these are lessons that cannot be as readily found in more recent wars. The chapters paint a vivid picture of the logistics operating environments in the Mediterranean and European Theaters of Operation that allied troops navigated during WWII. These also show reoccurring patterns in movement control challenges and solutions implemented to address these challenges. The movement control function, as seen in this thesis, is critical to combat success in large-scale combat operations.

As demonstrated in WWII, movement control will be required in future large-scale operations. From the training of troops, the deployment of forces, and beach landings, movement control was the key factor in getting troops, equipment, and supplies to their destinations. Though movement control was not yet completely defined at the outset of WWII, as its roles and responsibilities were spread across different echelons and organizations, its capability proved to be very necessary throughout the war. In situations where its capabilities were disregarded or diminished in priority for movement and arrival in the theater of operations, combat and logistics operations suffered immensely.

Likewise, large-scale combat operations of the future will require movement control in all phases of planning and execution. This was shown primarily in the European Theater of Operations when the Office of the Chief of Transportation deployed troops and teams to augment and support movement control efforts. Movement control elements will be required to support down to the unit level in such instances where units may operate in secluded or austere conditions or away from their higher headquarters. In addition, movement control support must be integrated in the deployment of forward combat support forces. This will prevent a similar situation to that in the Mediterranean Theater of Operations, where there was initially a lack of movement control. This will primarily involve its inclusion in the immediate port openings and operations immediately after being secured by combat forces.

All of the functions required during WWII remain valid requirements. In WWII European Theater of Operations, the organizations that performed movement control provide a preview of the movement control force size that will be necessary to operate in the types of large-scale operations in which the Army is currently preparing. By March 1945, the total European Theater of Operations Transportation Corps strength was 319,064, with movement control being about 10 percent of this structure.[177] Even under these conditions, the record of movement control in North Africa, Italy, and Southern France demonstrated a chronic shortage in movement control units and personnel. However, the Army's current movement control structure is not sufficient to meet the demands of a large-scale operation in a combat environment. Currently the Army's

[177] Wardlow, CMH Pub 10-19, 90.

movement control structure is very limited in size. Between all Army components, the structure is limited to one theater transportation movement control element, seventeen movement control battalions, and a total of one hundred twenty-eight movement control teams. The Army's total movement control strength is over 3,600 soldiers and even with the limited advances in technology and equipment, it's not enough to make up for the functional shortage. The Army must develop a structure that has the same functionality as those developed post-WWII. During this period, movement control reached its height with commands as far as the one-star general officer level. There were Transportation Movement Control Agencies (Theater Army Support Command), Transportation Movement Control Center (Field Army), Transportation Movement Control Center (Corps Support Brigade), Movement Control Teams, and Highway Regulating Teams.[178] Regardless, of the past growth in structure, there was always a need to augment these troops with civilian personnel.

Contracting will be required at every level of execution. The myth of contractors not being in the forward areas or past the corps area is unrealistic. If the study of history is used to prepare for future combat operations, the lesson learned for movement control in WWII is contracting will play a major role in its execution and planning. From the beginning of operations, contracting, primarily from the pool of local civilian labor, was implemented in movement control operations. There were many reasons why there was a large dependency on host-nation contract labor. As previously mentioned, even with the robust transportation structure, personnel shortages were always a problem. It was

[178] HQDA, FM 55-11, 2-2.

contract support that helped to close the gaps in labor shortages. In the situations where movement control support was limited or not part of the initial invading forces, it was the local contract labor that provided support until the arrival of troops. In areas where English was less prevalent such as the Mediterranean Theater, contractors helped to overcome the persistent language barriers and cultural differences that in many cases hindered or halted operations. Likewise, the hiring of local contractors came with its own set of challenges and risks. Their implementation into operations required high levels of supervision and chaperoning, which reduced the number of soldiers available for employment. As a result of the cultural differences, local laws, and customs, the contractors had different work methods and ethics that sometimes contributed to them not working with the same sense of urgency or level of quality desired by U.S. forces. As discussed about North Africa in chapter three, there was very little that could be done to punish contractors for infractions, substandard performance, or criminal activity. The host-nation contractors were not under the Uniformed Code of Military Justice or U.S. federal jurisdiction. Instead, they were under the jurisdiction of the local governments that at the time were unstable, frail, and limited in their abilities or unwilling to enforce the laws. Therefore, in future large scale combat operations the Army will need to take the same approach in leveraging host-nation contract support for movement control. A buildup and increase of movement control structure will only partially satisfy manpower and capabilities requirements. Movement control operations will require a unique knowledge of nodes, modes, ports, facilities, and their internal and external environments. It will also require a unique knowledge of relationships and key leaders within the community who may control certain resources and territories that play a key

role in daily operations. These are critical factors which will have the potential to impact movement control operations negatively or positively.

Another important lesson from WWII is civil considerations in both planning and execution. In each theater, civil considerations were key factors in every stage of execution. The movement control plans and operations had to consider the civil structure and arrangements. Countries where U.S. forces were present, were either under enemy attack or occupation and often very receptive to the U.S. presence. Despite these factors, countries attempted to sustain some level of normalcy to their governments and economies. This meant, regardless of the sense of urgency to defeat a common enemy, there was still an expectation for Allied forces to be limited in their use of host nation resources such as infrastructure and labor. In countries such as the U.K. and Italy where there were functional economies and industries, U.S. forces were provided limited uses of port facilities to accommodate the commercial shipping industries and unions. In some instances, such as in the U.K., limits were placed on the number of movement control soldiers and the hours that they could operate at the ports. This arrangement allowed U.S. forces to operate within union guidelines and provide maximum opportunity for civilian workers to have shifts and earning potential. In almost every country where Allied forces operated, contracting of local labor directly impacted the workforce pool for countries to sustain themselves. The operating environments placed Allied forces in a position to have to negotiate with local union or worker representatives over labor pay, scheduling, and availability. Even under these circumstances, special consideration had to be given. Many of the working age males were serving in or supporting the militaries in various capacities, which resulted in labor shortages and scarcity. Likewise in future large-scale

operations, movement control operations must be prepared to deal with the same challenges and more, especially with the advances in technology.

Port facilities for all nodes will be a major part of movement control operations. During this time, movement control elements must plan for limited use of facilities and operate in a sharing capacity with the host-nation users. These limits will not only encompass personnel but also equipment and hours. As shown in examples from WWII, the host nations will be mindful of cooperation but will prioritize its own interest. Therefore, they will seek to maximize pay and opportunities for its citizens, companies, economies. In many instances movement control soldiers may be required to incorporate civilians into their operations to increase movement capability or meet host-nation agreements. At other times they may be mandated to only have civilians perform work as to not interfere with the civilian workforces' opportunities to earn wages. It should be expected that the host-nation and unions will provide workers with the best hours of operations with the most opportunity to earn wages. Therefore, movement control units must also be cognizant of national, religious, and other cultural days that may interfere with operations or increase operating costs due to having civilian workers operate during those periods of observance.

In each theater of operations, the lack of an overarching, centralized movement control organization and command structure was at the center of every transportation challenge and problem. There was not a clear delineation between duties and responsibilities of different services and organizations. During this period, the Transportation Corps was relatively new and built from soldiers and equipment from the Ordnance and Quartermaster Corps. Therefore, movement control capabilities existed

only informally in the units while the structure and responsibilities of the Transportation Corps gained clarity. As a function of the growing pains, the Transportation Corps also did not integrate well with the other services. Systems and processes were often redundant, which placed a strain on resources and personnel, raised operating costs, and reduced throughput efficiency. Future large-scale operations will require an overarching movement control organization functionality akin to the TMCA to coordinate and manage theater transportation. This organization will need to transcend the separations that exist between services and serve as the chief coordinating office for all movements in the combat theater of operations. The structure does not need to be permanent but should be scalable based on requirements and maintain functionality. A headquarters element from an existing organization with the capabilities and personnel to perform such a mission could be the modular answer to this requirement. The organization should be a deployable element of the United States Transportation Command (USTRANSCOM) that only mobilize for large scale combat operations. The organization would need to be joint in nature, and have the capability to establish command and control over all movement control units and elements in theater. It would consolidate movement coordination by exercising control over those units throughout the different services that have a role or whose primary function is movement control. This will include control and coordination with the Air Force's Aerial Port Squadrons and Transportation Movement Offices, the Army's Movement Control Battalions and Teams, the Marine's Movement Control Centers, and the Navy's Maritime Commander's logistics cells.

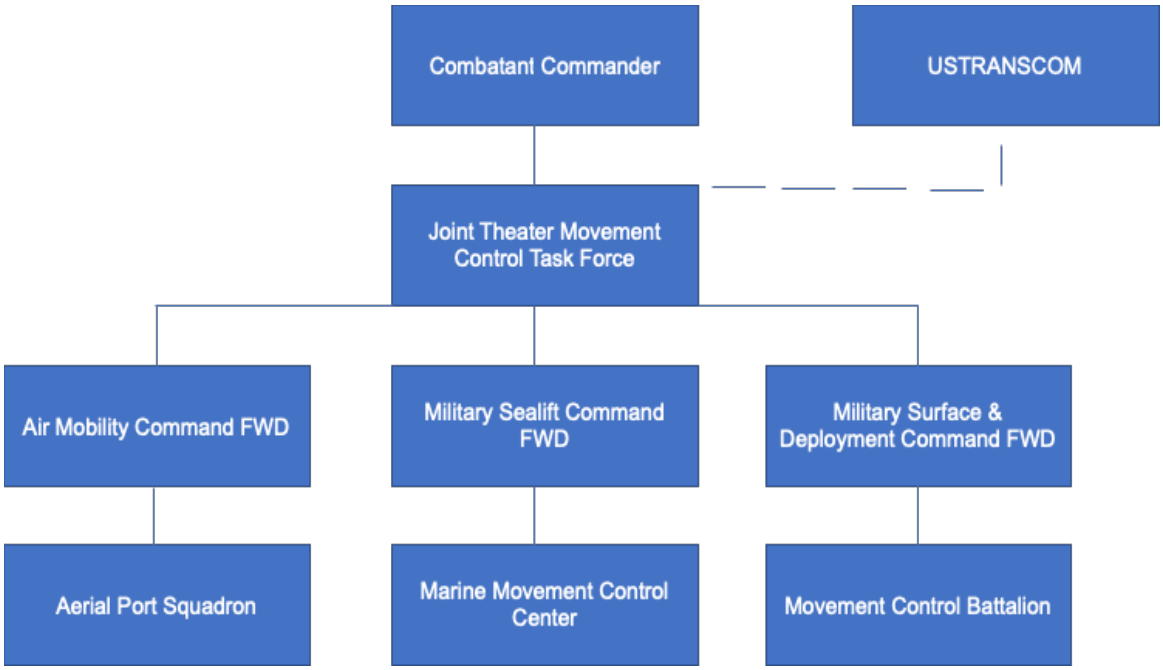


Figure 5. Base Joint Theater Movement Control Task Force

*Source:* Created by author.

Through this deployable element, USTRANSCOM will be able to support combatant commanders by providing forward elements of the Air Mobility, Military Sealift, and Surface Deployment Distribution and Distribution Commands. These forward elements will be deployed in a modular manner as mission requirements dictate to provide centralized movement control to specific theater modes of transportation. In addition, each forward element will be assigned a battalion or squadron-level movement control headquarters that also belongs to its organizational service component. These headquarters will be able to serve as the execution branches of their assigned forward commands. In instances required such as surges and retrogrades, these also provide a pool of personnel for support and augmentation to other movement control and transportation units. This concept will require zero growth in force structure but will

provide a robust movement control functionality that can provide the level required to sustain a large-scale operation of the future. It should replicate a TMCA type organizational function that coordinates and deconflicts the theater and intermodal friction that will ensue if the issue of centralized movement control is not reconciled.

As the Army continues to make the transition from counterinsurgency operations to large scale combat operations, it faces hard decisions for force structure. It must make the proper balance between demand and requirements in a fiscally constrained and rapidly changing environment. Leaders must keep the history of the WWII at the front of their decisions. The world has not witnessed a war on the same scale as WWII since its ending. Therefore, it is incumbent of military leaders to use it as a point of reference in the planning and preparing for the operations of the future. After over 80 years, the Army is still attempting to define movement control and understand exactly how it integrates into current and future operations. WWII provides a preview of the scale in which movement control must be planned, integrated, and executed in America's next large war. It provides the genesis of movement control, how challenges were overcome, and how the process matured as units gained more experience. Through these lessons Army leaders can avoid the mistakes of reducing the movement control structure and having to rebuild and relearn it during a time of crisis.

# BIBLIOGRAPHY


Army Force Management School. *How the Army Runs: A Senior Leader Reference Handbook*. Carlisle Barracks, PA: US Army War College, 2015.

Beursken, Keith. *Long Haul: Historical Case Studies of Sustainment in Large Scale Operations*. Fort Leavenworth, KS: Army University Press, 2018. https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi-books/the-long-haul-lsco-volume-4.pdf.

Bird, John Jr. "North African Campaign: Case Study." Study Project, U.S. Army War College, Carlisle Barracks, PA, 1991. https://apps.dtic.mil/dtic/tr/fulltext/u2/a233870.pdf.

Brewer, James. "Movement Control in Unified Theater of Operations." Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949. https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/326.

Bykofsky, Joseph, and Harold Larson. Center of Military History Publication 10-21, *The Transportation Corps: Operations Overseas*. Washington, DC: U.S. Government Printing Office, 1990. https://history.army.mil/html/books/010/10-21/CMH_Pub_10-21.pdf.

Cameron, Jonathan G. "The New Modular Control Team." *Army Logistician* 38, no. 1 (March-April 2006):1-5. https://alu.army.mil/alog/issues/marapr06/new_modular_move.html.

Clem, Rhoman. "Transportation in Unified Theater of Operations." Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949. https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/385/rec/2.

Coakley, Robert, and Richard Leighton. Center of Military History Publication 1-6, *United States Army in World War II: Global Logistics and Strategy 1943-1945*. Washington, DC: U.S. Government Printing Office, 1989. https://history.army.mil/html/books/001/1-6/CMH_Pub_1-6.pdf.

Department of the Army. "Lessons of Operation Torch." Compilation of Reports, Department of the Army, Washington, DC, January 1943. https://apps.dtic.mil/dtic/tr/fulltext/u2/a438192.pdf.

Doubleday, Abner. *Campaigns of the Civil War: Chancellorsville and Gettysburg*. New York. Charles Scribner & Sons, 1882. https://babel.hathitrust.org/cgi/pt?id=nyp.33433115689733&view=1up&seq=9.

Dworak, David. “Victory’s Foundation: US Logistical Support of the Allied Mediterranean Campaign, 1942-1945.” Dissertation, Maxwell School of Citizenship and Public Affairs, Syracuse, NY, 2012. https://surface.syr.edu/cgi/viewcontent.cgi?article=1094&context=hst_etd.

Eisenhower, Dwight. *Report by the Supreme Commander of the Allied Expeditionary Force.* Washington, DC: U.S. Army Center of Military History, 1945. https://history.army.mil/html/books/070/70-58/index.html.

Feidt, Gerald. “British vs. U.S. Movement Control.” Paper, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1947. https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/223/rec/1.

Headquarters, 15th Army Group Italy. *A Military Encyclopedia: Based on Operations in Italian Campaigns 1943 – 1945*. Washington, DC: Headquarters Department of the Army, 1945. https://archive.org/details/AMilitaryEncyclopediaBasedOnOperationsInTheItalianCampaigns1943-1945.

Headquarters, Department of the Army. Army Techniques Publication 4-16*, Movement Control*. Washington, DC: Army Publishing Directorate, 2013. https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/atp4_16.pdf.

———. Field Manual 55-10/4-01.30, *Movement Control*. Washington, DC: U.S. Government Printing Office, 2003. https://www.hsdl.org/?view&did=783861.

———. Field Manual 55-11, *Army Movement Control Units.* Washington, DC: U.S. Government Printing Office, 1973. https://www.bits.de/NRANEU/others/amd-us-archive/FM55-11%2873%29.pdf.

Headquarters, United States Marine Corps. Fleet Marine Force Reference Publication 12-14, *Logistics in National Defense*. Washington, DC: U.S. Government Printing Office, 1989. https://www.marines.mil/Portals/1/Publications/FMFRP%2012-14%20%20Logistics%20in%20the%20National%20Defense.pdf.

Killblane, Richard. “70 Years of the Transportation Corps.” U.S. Army Transportation Corps. Last modified February 27, 2020, https://transportation.army.mil/history/.

———. “The History of Movement Control.” History report, Transportation Corps, Fort Lee, VA, 2016.

Kimball, Richard. “Movement Control in Unified Theater of Operations.” Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949. https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/327/rec/4.

King, Benjamin, Richard C. Biggs, and Eric R. Criner. Center of Military History Publication 69-7-1, *Spearhead of Logistics: A History of the United States Army Transportation Corps*. Fort Eustis, VA: U.S. Army Transportation Corps; and Washington, DC: Center of Military History, United States Army, 2001. https://history.army.mil/html/books/069/69-7-1/cmhPub_69-7-1.pdf.

Kitchen, Mark "The North Africa Campaign: A Logistics Assessment." Master's thesis, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1991. https://cgsc.contentdm.oclc.org/digital/collection/p4013coll2/id/1387/rec/1.

Lee, Ulyses. Center of Military History Publication 11-4-1, *The Employment of Negro Troops*. Washington, DC: U.S. Government Printing Office, 2001. https://history.army.mil/html/books/011/11-4/CMH_Pub_11-4-1.pdf.

McFreely, H. F. "Movement Control within Armed Forces in United States." Paper, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1948. https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/359/rec/1.

Moses, Raymond, Charles J. Norman, Alvin H. Parker, Herbert F. Gagne, and John C. Henion. "The Mechanics of Supply in Fast Moving Situations." Study Number 27, The General Board, United States Forces, European Theater, June 1945. https://usacac.army.mil/sites/default/files/documents/carl/eto/eto-027.pdf.

Office of the Chief of Transportation. "14th Transportation Battalion." Unit History. United States Army Transportation Corps. https://transportation.army.mil/historian/documents/14th%20Trans%20Bn.pdf.

Ruppenthal, Roland. Center of Military History Publication 7-2-1, *The European Theater of Operations: Logistical Support of the Armies*. Vol. 1, *May 1941-September 1944.* Washington, DC: U.S. Government Printing Office, 1995. https://history.army.mil/html/books/007/7-2-1/CMH_Pub_7-2-1.pdf.

Speir, Frank "Transportation in Unified Theater of Operations." Staff study, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1949. https://cgsc.contentdm.oclc.org/digital/collection/p124201coll2/id/386/rec/1.

Stewart, George. Interview by Tymothy Caddell, Asheville, NC, June 7, 1985. https://transportation.army.mil/history/GO_bios/stewart.pdf.

The Transportation School. *Operation Overlord: An Historical Analysis.* Transportation School Monograph 3. Fort Eustis, VA. The Transportation School, October 1955. https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/id/4860/.

U.S. Army. "Transportation SOPs, etc, SOS, ETO." Headquarters, Services of Supply, European Theater of Operations, January 1965. https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/id/4738/rec/1.

U.S. Army, 727th Railway Operating Battalion. *The 727th Railway Operating Battalion in World War II.* New York: Simons-Boardman, 1948. https://ia601205.us.archive.org/9/items/727thRailwayOpBattalionWWII/727thRailwayOpBattalionWWII.pdf.

U.S. Army Combined Arms Support Command. "Movement Control Team Force Design Update Operational Concept Paper." Presented at the Force Development Directorate's Force Design Update Meeting, July 15, 2004.

U.S. Army Combined Arms Support Command, Force Development Directorate. Brief to U.S. Army Combined Arms Support Command Leadership, Fort Lee, VA, December 5, 2005.

U.S. Army Transportation Corps Museum. "World War I: Shifting to Motor Transport." U.S. Army Transportation Corps. Last modified October 6, 2020. https://transportation.army.mil/museum/wwi/index.html.

U.S. War Department. Field Manual 55-55, *Railway Operating Battalion*. Washington, DC: U.S. Government Printing Office, 1944. https://archive.org/details/FM55-55.

———. War Department Field Manual 100-10, *Field Service Regulations Administration*. Washington, DC: United States Government Printing Office, 1943. https://www.ibiblio.org/hyperwar/USA/ref/FM/PDFs/FM100-10.pdf.

———. Technical Manual 5-400, *Military Railways and Inland Waterways*. Washington, DC: United States Government Printing Office, 1942. https://archive.org/details/TM5-400.

The War Office, Quartermaster-General to the Forces. *Standing Instructions for Officers Commanding Units and Drafts Ordered Overseas (War) Long Sea Voyage.* Washington, DC: The War Office, December 1943. https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/id/4380.

Wardlow, Chester. Center of Military History Publication 10-20, *The Transportation Corps: Movements, Training, and Supply*. Washington, DC: U.S. Government Printing Office, 1990. https://history.army.mil/html/books/010/10-20/CMH_Pub_10-20.pdf.

———. Center of Military History Publication 10-19, *The Transportation Corps Responsibilities, Organization, and Operations*. Washington, DC: U.S. Government Printing Office, 1999. https://history.army.mil/html/books/010/10-19/CMH_Pub_10-19.pdf.