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14. ABSTRACT Currently, the United States Army does not have an effective or coherent concept to secure its supply lines. This can be attributed to supply convoy operations being categorized as an administrative activity and presumed to be conducted in an area of safety. This belief led to the acceptance of greater risks and inadequate doctrine, equipment, and training for the truck companies that traverse the battlefield sustaining the force. Although past conflicts highlighted the need for reform, the Army failed to indoctrinate lessons learned and was unprepared to secure its supply lines during Operation Iraqi Freedom (OIF). This forced the Army to re-learn the lessons it learned during the Vietnam War, when motor transport units created the gun truck and developed Techniques, Tactics, and Procedures (TTPs) to escort convoys organically. During OIF the Army again realized that this was the most feasible, suitable and effective option to secure its supply lines and began resourcing motor transport units with the resources to conduct convoy security operations through the Theater Provided Equipment (TPE) program. With operations in Iraq complete and operations in Afghanistan coming to a close, it is important that these lessons learned are codified by force developers. Using the DOTMLPF construct, this paper provides a recommendation to this end.					
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Executive Summary

Title: Supply Trains Force Protection: The Convoy Security Capability Gap and How to Fix It.

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Thesis: The Army has failed to institutionalize lessons learned from prior conflicts and produce an effective and coherent supply line/convoy force protection concept. To resolve this identified capability gap, the Army must reform motor transport units across all domains of the Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) construct and provide these units with the capability to conduct convoy security operations.

Discussion: Currently the United States Army does not have an effective or coherent concept to secure its supply lines. This can be attributed to supply convoy operations being categorized as an administrative activity and being presumed to be conducted in an area of safety. This belief led to the acceptance of greater risks and inadequate doctrine, equipment, and training for the truck companies that traverse the battlefield sustaining the force. U.S. adversaries have taken advantage of this shortfall by targeting convoys as seen in the Vietnam War and Operations Restore Hope and Continue Hope. Although these conflicts showed the need for reform, the Army failed to indoctrinate the lessons learned and was unprepared to secure its supply lines during Operation Iraqi Freedom (OIF). This capability gap and a need to reform were highlighted when offensive operations during OIF had to be delayed so that the Army could secure its supply lines. Force protection of supply lines continued to be an issue for the Army after the fall of the Hussein regime and throughout Phase IV and Phase V operations. This forced the Army to re-learn the lessons it learned during the Vietnam War, when motor transport units created the gun truck and developed Techniques, Tactics, and Procedures (TTPs) to escort convoys organically. During OIF the Army realized that this was the most feasible, suitable and effective option to secure its supply lines and began resourcing motor transport units with the equipment to conduct convoy security operations through the Theater Provided Equipment (TPE) program. With operations in Iraq complete and operations in Afghanistan coming to a close, it is important that these lessons learned are captured and codified in Doctrine.

Conclusion: To resolve the identified capability gap in convoy security, the U.S. Army must capture the lessons learned during OIF and modify motor transport unit authorization documents with the resources to conduct convoy security operations. To ensure this capability gap is effectively resolved, this concept and motor transport units must go through the force development process and reform across the DOTMLPF construct.

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Introduction

We may take it then that an army without its baggage-train is lost; without provisions it is lost; without bases of supply it is lost.

-Sun Tzu

To conduct a convoy in safety through an enemy's territory, where it is exposed to attacks either of regular or partisan troops, is one of the most hazardous operations of war.

-D.H. Mahan

On March 19, 2003, elements of the U.S. Army V Corps crossed into Iraq, achieving tactical surprise and commencing Operation Iraqi Freedom. Due to the element of surprise or the “rolling start” as it was called, V Corps was able to quickly defeat Iraqi forces en route to Baghdad without the several days of strategic preparatory fires that are traditionally executed. Operations were going better than planned for V Corps until March 23, when the 507th Maintenance Company was ambushed while conducting a convoy in the V Corps rear area. This attack left 11 Soldiers dead, seven captured, and nine wounded. Many contributed it to poor leadership, training, and discipline which they asserted were part of the Combat Service Support culture. In the ensuing days V Corps was forced to stop its advance and secure its Lines of Communication (LOCs) due to interdiction by bypassed and irregular forces. This event and what was to come as the operation continued, forced leaders to make an honest assessment of the Army's LOC/convoy security concept.¹

While conducting analysis, leaders soon found out that it was Army doctrine that was deficient, not the CSS culture. CSS units, particularly the motor transport units that operate on the LOCs conducting distribution to maneuver forces, were not adequately resourced to protect their convoys. Furthermore an examination of supply convoy operations during the Vietnam

War shows that this capability gap was identified and resolved by the Soldiers of the 8th Transportation Brigade who developed the concept of the hardened convoy and gun truck. Although the transportation community attempted to do so, this concept was not institutionalized through the force development process and Soldiers had to learn these lessons again during OIF. As force developers scrambled to fix the problem, the Army was forced to accept that the root cause was failure to institutionalize lessons learned from prior conflicts and produce a coherent and effective convoy force protection concept. To reverse decades of assuming risk in this capability, and to resolve the capability gap, the Army must reform motor transport units across all domains of DOTMLPF and resource these units with organic convoy security capability.²

This paper will identify and examine the convoy security capability gap by conducting case studies on the Vietnam War and OIF. Additionally, these case studies will also be used to extract developments that were successful in order to produce a recommendation based on proven concepts. Within this context several salient questions will need to be answered: Why does the capability gap exist? What actions led to the creation of the gap? Is the capability gap only valid in the contemporary operating environment? This is not to find culpability, but to ascertain if convoy security is an enduring requirement which will have implications on the allocation of resources in a fiscally constrained environment.

In order to frame the problem correctly, it is important to understand the history of convoy security doctrine within the context of warfare and how decisions made almost a century ago led to today's capability gap. To this end, a historical review of convoy security doctrine and operations will be conducted beginning with an examination of pre and post-World War I concepts. This will be followed by a review of convoy security during World War II and the Korean War before conducting a case study on the Vietnam War. This segment will use actual

engagements to illustrate how inadequate doctrine, equipment, and training led to Soldiers unprepared for the realities of combat and how these Soldiers developed the doctrine and equipment to remedy the problem. The paper will then survey convoy security operations during OIF and examine how Soldiers had to re-learn the lessons of the Vietnam War. The paper will then conclude with an analysis of the findings and attempt to answer the above questions before finishing with a recommendation using the DOTMLPF construct.

Pre-World War I Convoy Security Doctrine and Operations

The need for secure supply lines is an axiom of warfare and has been accentuated by strategists since Sun Tzu. U.S. Army doctrine and more importantly institutional culture towards convoy security can be classified into two broad phases: pre-World War I and post-World War I. Before World War I, protection of supply lines was a high priority task for American forces. The significance of convoy security was displayed in the American incursion into Mexico in 1847 and during its battles with the Native Americans throughout the 19th century. These experiences were captured and outlined in *The 1862 Army Officer's Pocket Companion: A manual for Staff Officers in the Field*. This manual outlined the use of combat arms to defend convoys and assigned engineers to trains for survivability and maneuverability purposes. The cavalry was used as a front, rear, and flank guard and to conduct recon. The infantry walked alongside, in front of, or the rear of the train depending on terrain. Around this same time period, the military revolution created by the Industrial Revolution introduced technologies that allowed smaller units to cover larger fronts. This marked the beginning of supply convoys being viewed as an activity conducted in a safe area and the importance of convoy security being institutionally lost. Although this was not particularly true on the American frontier as U.S. troops were literally in "Indian Country" and secure supply lines were the difference between life

and death.³ By the time the Army published the *Field Service Regulations of 1914*, linear warfare and the proposed safe rear created by the advancements in technology had been around for a significant amount of time. Although the regulation did divide the theater of operations into a zone of advance and a zone of line of communication, it also addressed security of trains in depth. The infantry and cavalry continued to be assigned to protect the trains, as well as Military Police (MP) being added to the detail for the first time.⁴ Convoy security operations proved to be a critical task when General Pershing executed his Punitive Expedition into Mexico in 1916 to capture Pancho Villa. General Pershing considered the protection of his trains to be so important that he published General Order Nine which mandated that all supply trains be accompanied by a minimum of 50 rifles. The fact that the Expeditionary Commander issued the order symbolizes the importance placed on convoy security by commanders at the time. The policy proved to be effective as no trains or personnel conducting resupply/convoy security operations were lost throughout the operation. Nonetheless, the Army's attitude towards convoy security would drastically change following its involvement in World War I.⁵

The overwhelming firepower created by the advances in technology in the early 20th century virtually purged maneuver from the battlefield, and led many to believe defense to be the superior form of warfare. This led to the World War I hallmarks of trench warfare and stalemate. In turn, this created an actual linear battlefield with a safe rear as forces that attempted to maneuver were mowed down with machine gun fire or dispersed by an artillery barrage which was now more accurate. With no threat to supply trains during World War I, the need to assign combat arms personnel to conduct security was obviated. This led to a drastic shift in the importance placed on convoy security as scribed in the updated regulation published in 1923.⁶

Post-World War I Convoy Security Doctrine and Operations

The *Field Service Regulations of 1923* was revolutionary compared to its predecessor due to the leaps in military technology that occurred during World War I and shortly thereafter. Industrialization changed how ground war was fought with the advent of the tank, airplane, and other motorized/mechanized inventions. Basing the new regulation solely on the operational environment of World War I, convoys and convoy security were removed from the regulations. The regulations did mention motor transport operations, but focused on the movement of troops. The regulations failed to discuss operation and security of supply trains but did, however, relieve divisional combat arms Soldiers from the task of conducting security operations in the communication zone.⁷ This task of “policing” the communication zone was assigned to the MPs but convoy security was never mentioned in the regulation or in the *Manual of the Motor Transport Corps of 1918*.⁸ This codified the assumption that the supply lines would always be secure and placed convoy security at a low priority for future commanders.

World War II Convoy Security Doctrine and Operations

The general belief is that the linear battlefields of World War II provided a safe rear, but a closer examination proves this to be a fallacy of presumption. The U.S. Army entered World War II with doctrine stating the rear area was secure. The Americans did not experience any significant events that negated this supposition so it was assumed to be true. To understand why this is a fallacy in light of what some may call empirical evidence the strategic context of World War II must be understood. During the Interwar Period the belligerents attempted to innovate and develop a fighting force that effectively incorporated all the new technologies made possible by the Industrial Revolution and break the stalemate displayed during World War I. The

Germans proved to be more capable than their adversaries in doing so and developed an effective concept that brought maneuver back to the battlefield through the use of combined arms. This technically ended the era of the secure rear as armies once again had the capability of flanking their enemies and getting into their rear.⁹

The Germans displayed this capability early in the war. During their invasion of Poland the Germans quickly encircled Polish forces, cut their supply lines, and forced the Poles to surrender. A study of the North Africa Campaign also shows the importance placed on supply line security by both the Allies and the Germans as both sides maneuvered to prevent interdiction of their supply lines which would have all but ensured defeat. The most prominent event for the Americans in World War II that shows that supply lines were not as safe as believed was the Battle of the Bulge. The Battle of the Bulge took place when Hitler ordered his armies to burst through the Allies' lines and cutoff their supply lines originating from the port in Antwerp. At this point in the war German defeat was already certain and the operation failed as they no longer had the logistical capacity to sustain the offensive, however it does give a well-known point in World War II when American supply lines were targeted by a ground force.¹⁰

An examination of the Eastern Front depicts the precariousness of the rear area during World War II. During their push into Russia, the Germans were forced to re-assign 25 divisions to secure their supply lines which were under constant attack by bypassed Russian forces and partisans.¹¹

On the western front, there were approximately four million Americans plus their allies pushing into Germany. Because of the mass amount of Soldiers in theater, the LOCs were naturally secured by forces moving east. As a result, American LOCs during World War II were fairly secure and reinforced the notion of a secure rear area. The only serious threat of

interdiction came from aircraft, which led to machine guns being mounted on distribution vehicles which traveled without escort. With no significant attacks on American supply lines, the notion of a secure was validated. Although the complex environment presented during the Korean War would soon show the faults in this assumption, it had now become solidified within Army culture.¹²

Korean War Convoy Security Doctrine and Operations

The Korean War was fought as a conventional war on a linear battlefield, but both sides trained forces to infiltrate the other's rear area. American convoys continued to travel without escorts, but were frequently interdicted by Chinese and North Korean units. These attacks presented a constant threat to friendly supply lines and warranted a reaction. The U.S. and South Korea were forced to pull troops off the line and launched a counteroffensive which exterminated an estimated 20,000 guerrillas.¹³ Soldiers also used their machine guns, which were authorized as anti-aircraft weapons, in a ground role and supply line interdiction never became a significant enough problem to change the Army's culture on supply convoy operations.¹⁴ The Army would not be so lucky in its next conflict which would be fought on a non-contiguous battlefield which exponentially exacerbated the problems with the Army's deficient supply line/convoy security concept.

Vietnam War Convoy Security Case Study

The Army would enter the Vietnam War with incoherent doctrine and an inadequate concept to secure its supply lines. Supply convoy doctrine was still based on the assumption of a secure rear area, and operations were classified as administrative moves. Conversely, TTPs were produced for personnel movements which were classified as tactical convoys.¹⁵ The doctrine at

the time rarely mentioned security or escort of supply convoys outside of administrative reasons such as police escort to facilitate traffic. The security policy and the general attitude of the Army in regards to supply movements are outlined in paragraph 50 (Distinctive Characteristics) of FM 55-30, *Motor Vehicle Transport* (1963):

Since most supply convoys operate in the communications zone or in the rear areas of the combat zone, they normally require no advance, rear, or flank guards. Supply movements are made in general by truck companies with personnel sufficient only for the actual conduct of the convoy. There are no personnel available to provide security or extensive reconnaissance. When supply convoys do require reconnaissance and security, these functions are performed by troops provided for the purpose. Passive security measures, including use of cover and concealment and camouflage discipline, are used as appropriate.¹⁶

This assumption of a secure rear area and communication zone would soon be disproven.

With the rise in the use of irregular warfare against Western powers after World War II, Army force developers were aware that the assumption of a safe rear was no longer valid in the current operating environment and supply line interdiction was almost certain. This was outlined in FM 100-5 *Field Service Regulations Operations* (1962) when it discusses the need to train against the interdiction of lines of communication in its chapter on operations against irregular forces. The chapter also suggests the use of tanks, air support, helicopters, and armored vehicles to escort convoys.¹⁷ This displays a picture of incoherent and contradictory doctrine. The Army either failed to recognize the Vietnam War as a fight against irregular forces or decided to assume a critical amount of risk in not securing its supply lines. The Army had doctrinal concepts to protect personnel convoys but failed to apply these to supply convoys which they continued to classify as administrative movements. Also, the threat to supply convoys during irregular warfare discussed in FM 100-5 was not transcribed into FM 55-30.¹⁸

Military Assistance Command Vietnam (MACV) failed to develop an adequate LOC security plan which was critical in the non-contiguous environment of the Vietnam War. The doctrine at

the time, directed combat units to secure routes within their area of operations which most did by establishing strong points at key infrastructure but field operations were the priority. MPs were responsible for conducting route security operations and escorting convoys which transportation units had to request and receive on an availability basis. The problems with the inadequate supply line security concept were further exacerbated due to the fact there was no secure area within the country to establish the doctrinal definition of a communication zone. The Vietnam War presented a non-contiguous battlefield in which there was no definitive front line or boundary to mark separation between the combat zone and communication zone.¹⁹ Despite the operational environment, the MACV commander made no changes to the LOC security concept. This doctrine may have sufficed in a small scale contingency, but the requirements to sustain such a robust force required a large number of supply convoys. For example, from December 1967 to December 1968 approximately ten million tons of cargo was moved in Vietnam via truck.²⁰ There were simply not enough MPs in theater, or the U.S. Army, to effectively provide security for the amount of convoys required. This further shows incoherence as force structure did not match force requirements. Additionally, maneuver forces found themselves engaged almost daily, which was a change from previous wars, and were not available to escort convoys. Transportation units had to compete with the several other requirements of MP and maneuver units and therefore conducted most of their missions unescorted.²¹ U.S. forces soon learned this was a costly mistake as the truck companies lacked adequate lethality and survivability resources to conduct convoy security operations.

The major buildup of U.S. Forces in South Vietnam occurred from 1965-66. The 1st Logistical command divided the country into three support commands each with an assigned motor transportation group. The 8th Transportation Group (Motor Transport) was assigned to

U.S. Army Support Command, Qui Nhon, which operated in II Corps' AO in the central portion of South Vietnam. The central highlands were strategic key terrain because if captured it would cut the country in half. Additionally, Route 19, the site of the infamous destruction of French Mobile Group 19 during the First Indochina War, ran through this area. The MACV commander wanted to keep this route open as a show of force and established garrisons throughout the route with the 1st Cavalry Division at An Khe covering the east and 4th Infantry Division at Pleiku located in the west. Route 19 was also one of the only east-west routes in the country and due to this and the aforementioned reasons it would become the most ambushed route in Vietnam.²²

The 8th Transportation Group was responsible for moving supplies from the port, which was technically the communication zone, at Qui Nhon to base camps along Route 19 to Pleiku and then to camps north and south along the Cambodian border. The trip was a total of 110 miles one way and included two mountain passes. Soldiers could not drive over 15 miles per hour due to road conditions which slowed down to 4 miles in some areas. As per doctrine, the convoys traveled unescorted although combat units placed personnel at key points along the route. The MPs opened and closed the route everyday as well as cleared it along with engineers who swept for mines. A Quick Reaction Force (QRF) was located at the Mang Giang Pass in case of an attack, but for the first two years the convoys only experienced the occasional sniper and mines along their route. During this time most contact was made in the "communication zone" where night convoys moved material from the port to the marshalling area to be pushed forward.²³

Realizing they would have to defend themselves due to the lack of escorts available the 8th Transportation Group began experimenting with ways to make its vehicles more lethal and survivable. Initially, the unit attempted to procure ring mounts but they were not able to acquire any through the supply system so they came up with the idea to basically build a crew serve

weapon fighting position in back of their cargo trucks. The Soldiers placed sandbags throughout the vehicle and used metal plates on the doors and along the sides. Due to a lack of resources, the unit was only able to procure enough material to build a few platforms before enemy preparation for the Tet offensive and a change in strategy by the North Vietnamese Army (NVA) would make the unit a primary target.²⁴

The change in tactics by the NVA can probably be attributed to the effectiveness of the air assault concept being employed by the 1st Cavalry Division. With the lack of success against the Americans thus far the NVA simply did what any military strategist/tactician would do and went back to problem framing. By conducting a Center of Gravity(COG) analysis, the NVA would have easily come to the conclusion that the critical vulnerability for the air mobile units were their logistics specifically fuel which had to be trucked in. Furthermore, the NVA observed these movements for more than two years and was aware of the lack of adequate security and where terrain presented it with the best advantage for success. The NVA didn't have to shut the MSR down, but if they could destroy enough fuel assets, it would force a change in the U.S. Army's strategy.²⁵

On 2 September 1967, American forces would be subjected to the first large scale deliberate attack against its supply lines. A convoy of 90 vehicles split into two serials was heading east with two gun jeeps as escort. The front serial consisted of 37 vehicles from the 54th Transportation Battalion and was split in two by a fuel tanker that was falling behind due to mechanical problems. As the convoy approached the An Khe Pass a dug in enemy with the advantage of shooting down from the hills awaited them. The NVA initiated contact by destroying the lead escort jeep with a 57mm recoilless rifle. The NVA then began firing down on the convoy setting the lagging tanker on fire. At the time either there was no policy set on

reacting to an ambush or it was not rehearsed as accounts vary. The second gun jeep was at the back of the 90 vehicle convoy so it could not assist personnel in the kill zone. Soldiers left their vehicles to take cover and return fire which was a fatal move since the convoy was now locked into the kill zone. The drivers quickly ran out of the small amount of ammunition they were allocated, but due to fear of American tactical airpower the NVA only planned to stay on location for a short period of time. In this small amount of time the NVA was able to destroy or damage 30 of the 37 vehicles in the serial. Seven Soldiers were Killed in Action (KIA), and an additional 17 were Wounded in Action (WIA).²⁶

The 8th Transportation Group immediately revisited its Standing Operation Procedures (SOP) and found that each battalion had its own Techniques, Tactics, and Procedures (TTPs). Additionally, due to lack of contact, complacency had set in and rehearsals were not being conducted. The SOP was then overhauled focusing on speed, intervals, and actions on contact. Most importantly drivers were told to get out the kill zone at all cost. While these measures provided minor steps in solving the issue, the matter of how to effectively secure the convoys was far from reaching resolution.²⁷

Shortly after the attack, the II Corp Tactical Zone commander held a meeting with his subordinate commanders and the 8th Transportation Group to discuss what policies and procedures needed to be implemented to provide adequate protection for the convoys. By doctrine, battle space owning units were responsible for route security within their AO. Due to its high operational tempo the 1st Cavalry Division could not spare any forces, so the 4th Infantry Division was tasked with securing the route.²⁸

The 4th Infantry Division setup checkpoints at bridges, culverts, and other likely hotspots throughout the route, but was unable to establish positions in the mountain passes. There was a checkpoint on an average of every three miles, each being guarded by tanks and mechanized infantry. These forces served as a QRF that could be called on, in the case of an ambush. Additionally, the route was closed at an earlier time so that the NVA could not use the cover of darkness to escape. The Military Police began providing two gun jeep escorts to provide security for every convoy, one as an advance guard and the other as a rear guard. If the situation permitted the convoys also had access to air support. Other measures to increase convoy safety included paving the route and cutting the vegetation back so it could not be used by the NVA for cover and concealment.²⁹³⁰

With their prior experience, the 8th Transportation Group leadership knew that the two MP gun jeeps did not possess the firepower to fix enemy forces until the QRF arrived and that the truck units would have to create a way to provide this capability organically. Soon after the attack, steel plates that had been ordered earlier came in and the group commander ordered his subordinates to create gun trucks and also added gun jeeps to the convoys. The gun truck slowly developed over time with initial vehicles armed with quad .50s borrowed from artillery units. Each gun of the quad .50 fired in the same direction and required a crew of six so its use was soon discontinued. The standard gun truck consisted of two M-60 machine gunners in the pillbox and a grenadier in the passenger seat. As ring mounts became available some crews mounted a .50 caliber machine gun on the cab. The unit also began developing doctrine for the new concept and settled on a one to ten gun truck to distribution vehicle ratio. In the case of contact, the gun trucks would mass fires on the enemy while the rest of the convoy got out of the kill zone.³¹

The NVA would not make the Soldiers of the 8th Transportation Group wait long to validate their new concept. On 24 November 1967, Soldiers from the 54th Transportation Battalion were ambushed while conducting a movement composed of 59 distribution platforms, five gun trucks, and three gun jeeps. The NVA placed several mines across the route and were able to lock all but one vehicle in the kill zone, but the gun trucks eventually achieved superiority and were able to fix the enemy until the 4th ID was able to come on scene and flank the NVA. In the end, the enemy had damaged 14 trucks including four gun trucks while killing two and wounding 17. The combined efforts of the gun trucks and the 4th ID accounted for 41 enemy KIA and four WIA. While it wasn't the perfect engagement, the gun truck showed its effectiveness as they were able to fix the enemy which the NVA did not expect the transporters to be able to do. More importantly, it gave the Soldiers confidence and an experience to learn and adapt their TTPs to become more effective.³²

The next major ambush occurred on 4 December, when a convoy of 69 distribution platforms, six gun trucks and four gun jeeps was ambushed. The lead gun truck noticed mines in the roadway ahead and stopped. The truck was then immediately hit with small arms fire and a recoilless rifle which killed the driver and wounded the gun crew. The remainder of the convoy responded with vigor and resolve. The NVA troops repeatedly attempted to assault the convoy but were repelled by the overwhelming fire power of the gun trucks and gun jeeps. The Gun trucks outside of the kill zone moved up and the convoy was able to achieve fire superiority and broke up the ambush before the QRF arrived. The Soldiers killed 13 enemy troops and captured one, while suffering one KIA and six wounded. The Soldiers now possessed the tactical knowledge, and resources to not only fix, but destroy enemy ambushes. The II Corp Tactical

Zone Commander lauded the Soldiers for their actions during the two convoys and the gun truck, while unauthorized, became accepted by MACV.³³

The Soldiers would soon find out that the increase in ambushes they were experiencing was in preparation for the Tet Offensive, as the NVA attempted to shut down the American supply line. The gun truck surprised the NVA and ensured that every convoy completed its mission throughout the campaign. The Soldiers continued to improve their gun trucks, including rigging internal communication systems and adapting their TTPs as the enemy adapted to them. The gun truck concept would eventually be adopted by three of the four Corps Tactical Zones with the fourth abstaining due to the availability of combat arms Soldiers to escort their convoys.³⁴

The Army eventually fielded V-100 armored cars to the MPs to conduct convoy security operations, but the vehicle did not measure up to the capabilities of the gun truck. For instance, the vehicle came equipped with two 7.62 machine guns which could not operate autonomously. The one advantage the armored car had over the gun truck was it provided 360 degree protection but this restricted the crew's view of the battlefield. Impressed by the 360 degree armor, the 1st Logistics Command commander forwarded a recommendation to the Army Assistant Chief of Staff for Force Development that the armored cars be placed on the MTOE of truck companies. However, an earlier report that recommended that MPs continue responsibility for convoy security had been produced and both the U.S. Army, Vietnam, and U.S. Army Pacific commanders concurred with this recommendation. The Army Assistant Chief of Staff for Force Development also concurred and the MPs continued to be officially responsible although the gun truck continued to be the first choice in convoy security and was used up until the U.S. withdrawal from Vietnam.³⁵

In 1970, the Assistant Chief of Staff for Force Development authorized an Army Concept Team to conduct an evaluation of convoy operations in Vietnam. The team executed an objective examination of convoy operations between December 1970 and March 1971 and published their findings in a 177 page report titled *Final Report Vehicle Convoy Operations in the Republic of Vietnam (ACTIV Project No. ACG-78F)*. The report was a goldmine of lessons learned and detailed the effective convoy security concept that had been developed over the past five years of combat. The document justified the transportation units developing the gun truck and acknowledged the superiority of the gun truck over the XM-100 in its ability to conduct convoy security.³⁶ Most importantly, it acknowledged that transportation units did not possess adequate organic resources to provide protection for their convoys and that a vehicle be developed with this capability and made organic to transportation units.³⁷ In the end, force developers chose not to provide transportation units with organic security capability and set the stage for Soldiers to relearn the same lessons again thirty years later during OIF.

OIF Convoy Security Case Study

The U.S. Army began OIF with the same convoy security concept it had before the Vietnam War. Combat units were still responsible for route security within their AO and route security and convoy escort remained MP tasks. The assumption that transportation units would operate in a secure environment was also intact although doctrinal writers came up with a more sophisticated way to denote it. FM 55-30 Army *Motor Transport Units and Operations* (1997) states “The motor transport unit committed to the move normally affords security and/or reconnaissance support required for movements”.³⁸ The manual goes on to read:

Military police units may provide convoy security to a specific convoy or on an area basis. Security of routes is an MP mission. However, the availability of MP support depends on the

threat in the area of operations, the sensitivity of the cargo, and other missions the MPs must support. If available, escort and security elements are used to secure and protect the convoy from enemy activity.³⁹

Additionally, just as in the Vietnam War force structure and force requirements were not coordinated as there was a significant disparity in the number of MPs in the Army and the number required to conduct its wartime missions. This problem was further exacerbated due to the new obligations placed on MPs in response to the Global War on Terrorism. The 18th MP Brigade, consisting of 10 companies was sourced to deploy in support of OIF. Their missions included EPW operations, high-value asset security, main supply route (MSR) regulation, and enforcement and area security operations for the whole theater of operations. With so many tasks and so few personnel available, the likelihood of transportation units receiving escorts was low.⁴⁰ This mistake had once been paid for in blood and sweat on the MSRs of Vietnam by transporters. Now a new generation of transporters would have to learn that they too, would have to fend for themselves.

The operational environment of the initial invasion in OIF varied greatly from that of Vietnam. In the OIF theater of operations there was a relatively secure communication zone in Kuwait that had been in operation since the end of Operation Desert Storm. Similar to the Vietnam War, transporters were required to drive in the divisional rear areas which were assumed to be safe but were in fact battlefields. V Corps was in charge of all Army units during the invasion and conducted operations on the western portion of Iraq leading up to Baghdad. In order to achieve tactical surprise the invasion into Iraq was initiated with only a fraction of the troops planned to participate in the campaign. The sustainers would suffer the most from this decision as truck companies as well as MPs were pushed to the rear of the force flow.

Additionally, there would be no maneuver forces following behind the 3rd Infantry Division, the

Army's tactical level unit during the march to Bagdad, which meant LOCs would not be secured as the main effort advanced. Although, inadequately resourced for the environment supply convoys bravely negotiated the treacherous roads and sustained the movement north, but the Iraqi's would score a major victory in their attempt to interdict the American LOCs. On March 23, the 507th Maintenance Company was ambushed leaving 11 Soldiers dead, seven captured, and nine wounded. The Iraqis exploited their success by ensuring that it got out to the media. To counter, the U.S. highlighted the Jessica Lynch rescue operation. Although, the episode didn't alter the American population's support for the war, which was one of the Iraqi's objectives, it did force the Army to examine why the Soldiers were so unprepared for the situation.⁴¹ Irregular and by-passed forces continued to attack the unsecure supply lines and the V Corps commander was forced to halt the advance until he could move up additional forces in order to secure the Corp's LOCs.⁴²

Due to the lack of MPs available the Combined Forces Land Component Command (CFLCC) required only two escorts for convoys regardless of the size. This was grossly inadequate for the volume of small arms, RPG, and IED attacks the convoys faced. Once again transporters were forced to take matters into their own hands and began creating gun trucks. The 181st Transportation Battalion is credited with establishing the first gun truck companies and developing the applicable doctrine. Working out of Kuwait the unit developed several gun truck models ranging from the HMMWV all the way up to using the M915 and its 40' trailer as a platform although the former was mostly used. The Soldiers applied "Hillbilly Armor" and mounted machine guns any way that proved effective. The concept proved effective as it allowed Soldiers to escape the kill zone and kept V Corps supplied throughout the operation.⁴³

During stability and support operations, Kuwait and Logistical Support Area Anaconda, better known as Balad, served as the two main distribution hubs used to resupply forces spread out over an area the size of California. Phase IV operations placed more requirements on MPs and few were available to escort the 130 to 140 daily major logistical convoys required to sustain the force. Transporters continued to escort themselves with a high degree of success up until the April uprising which came with an enemy change of tactics.⁴⁴

The April 2004 uprising would come at the worst time for U.S. forces as it coincided with the rotation of new units into theater. On 9 April, the anniversary of the toppling of the Hussein regime, almost every convoy would be attacked. On this day, the 724th TC was conducting a convoy consisting of 17 fuel tankers and two tractors being driven by contractors with Soldiers serving as gunners in every other vehicle. The escort team consisted of two HMMWVs, two 5-ton tractors, and one 5-ton cargo truck for a total of five gun trucks. At the time any vehicle with a crew-served weapon qualified as a gun truck and armor was not required. The company was new in theater and three days earlier had experienced its first ambush in which it suffered no casualties or damage to vehicles while inflicting multiple casualties on the enemy. This ambush would be different from previous attacks due to its sophistication and composition. The enemy held a 10:1 ratio and sustained their fire instead of fleeing as their objective was total destruction of the convoy.⁴⁵

The convoy's planned route from Anaconda to Baghdad International Airport (BIAP) required the use of ASR Sword which reputation had earned it the nickname "IED Alley". As the Soldiers negotiated the numerous obstacles placed on the road one of the contracted fuel trucks suddenly exploded and the entire convoy began taking small arms fire from both sides of the road. Unknowingly, The Soldiers had driven into a four to five mile kill zone consisting of 150

to 200 enemy fighters. As per SOP, the drivers attempted to clear the kill zone but were hindered by obstacles including burning civilian fuel tankers. The convoy commander, already wounded, decided to get off the highway and led as many vehicles as possible to a cordon set by a cavalry unit that had been fighting insurgents in the area the day before. The remainder of the convoy continued their attempt to escape the kill zone, which now was littered with destroyed vehicles and billowing with smoke. The Soldiers continued to return fire, but could not gain superiority to cover their exit due to the large number of insurgents. Vehicle after vehicle was destroyed while convoy members recovered each other as they moved out of the kill zone. In total, seven fuel trucks and one HMMWV were left in the kill zone as the others made it to safety before the cavalry could respond with tanks and armored vehicles. The attack would claim the lives of six contractors and one Soldier. Additionally, one contractor and two Soldiers were taken captive. Weeks later the contractor was able to escape, but both Soldier's bodies would be found at later dates.⁴⁶

Most of the convoys fared well that day, including one engagement in which transporters were able to tally 29 insurgent KIAs to only one American wounded. There were several acts of heroism and the "combat trucker" was resurrected. Logistical convoys were not the only elements under attack as forces throughout Iraq were busy quelling the uprising. The insurgents were able to overrun key towns and destroyed several key bridges which limited the amount of routes American forces could utilize. In response, the CJTF-7 commander closed the MSRs and only authorized mission critical convoys to be conducted. Units soon ran low on resources and the commander had no choice but to re-mission combat troops to open and clear the routes.⁴⁷ The complex and sustained attacks on logistical convoys continued throughout April. Although most convoys fared well, it signaled a need for change.

The higher command could no longer ignore the need for a standardized convoy protection platform, adequate armor and armament, and standardized doctrine. Following the uprising, the CFLCC authorized the creation of gun truck companies, which the transportation battalions were already developing. There were several changes implemented including decreasing the total number of vehicles in a convoy, establishing gun the truck to distribution vehicle ratio at 1:5, taking Soldiers out of trucks driven by contractors and several other measures.⁴⁸ Additionally, a Joint Field Manual that encompassed the lessons learned and provided troops with the knowledge to be successful in the current operational environment was published.⁴⁹

The Army was well aware of the need to provide all of its forces with increased survivability and contracted several companies to produce up-armored HMMWVs and add on armor kits. The issue was already circulating around the media but went “viral” when a Specialist in the Tennessee National Guard asked then Secretary of Defense Donald Rumsfeld “Why do we Soldiers have to dig through local landfills for pieces of scrap metal and compromised ballistic glass to up-armor our vehicles?”⁵⁰ At the time most units had ceased using unarmored vehicles for tactical operations but logistical units did not have this luxury. By the end of 2006, the Army Material Command (AMC) had developed armor for all tactical wheeled vehicles. Additionally, the Army fielded the M1151 Armament Carrier HMMWV to serve as a gun truck which was now being referenced to as a Convoy Protection Platform (CPP). The vehicle came with factory installed armor and several add-on pieces of armor. The add-ons provided 360 degrees of armor for the occupants and gunner and the vehicles were fielded to transportation battalions. Most transportation battalions created gun truck companies while others required each transportation company to establish a security platoon. The Army had finally accepted that the most effective

way to secure its supply lines was to by allocating the motor transport units with the resources to organically conduct convoy security operations.

As the Army developed the capabilities to defeat the threat, the enemy also adapted. For example, once the Army succeeded in up- arming all its vehicles, the enemy began using Explosively Formed Projectiles (EFP) IEDs which burned straight through the new up-armored HMMWVs. Force developers answered and by 2009 had fielded 21,000 Mine Resistant Ambush Protected (MRAP) vehicles and developed ballistic panels to counter the EFPs. Transportation units continued to be resourced with the latest survivability and lethality equipment and by time the war ended it was hard to differentiate from a convoy escorted by a transportation company and one escorted by maneuver forces.⁵¹

Although the Army had to re-learn the lessons of the Vietnam War, in the end an effective convoy security concept was developed. The Army finally acknowledged that the most efficient and effective way to secure convoys was by allotting the transportation companies the resources to do so. The most salient changes were that transporters were officially sourced to theater to conduct convoy security operations and the myth of a secure area was removed from doctrine. There were several developments over the course of the war; some were codified in doctrine while most were not. At the time research was completed for this paper transportation units had to rely on Theater Provided Equipment (TPE) for the necessary resources to conduct operations in theater. At home station units are only authorized to draw equipment from Pre-Deployment Training Equipment (PDTE) stocks once they have received deployment orders and even then they may not have the required equipment on-hand.⁵² With the implementation of FY 15 force modernization efforts, some required equipment has been authorized on select motor transport unit MTOEs which will be discussed in the next section. To ensure that all lessons learned are

institutionalized and an effective convoy security concept is developed, this capability must be taken through the force development process and validated across all domains of the DOTMLPF construct.

Findings and Analysis

Convoy security was a high priority mission in the U.S. Army up until post World War I, when doctrine first stated the notion of a secure communication zone and rear area. From this point on the importance of supply line/convoy security diminished overtime in the U.S Army and led to the deficient concept that obtained as OIF commenced. The question is how the Army went from the explicit supply line/convoy security doctrine and TTPs annotated in its capstone doctrinal manual to the contradictory and ineffective concept that obtained for most of the 20th century and still lingers today.

Virtually all literature produced today has used the “Cold War Theory” to explain why the Army has failed to develop an effective supply lines/convoy security capability concept. The “Cold War Theory” is the theory that National Military Strategy focused solely on the Soviet Union, which led the Army to dismiss the lessons learned during the Vietnam War and other campaigns that didn’t fit the desired construct. During this time Army force development and strategy is thought to have focused only on fighting a conventional force on force war in Europe against the Soviets. This force on force war would be fought on a linear battlefield with a clear front line and a secure rear area. After the Cold War ended, proponents say the U.S. Army failed to adapt its strategy to the “Contemporary Operating Environment” which now consists of “asymmetrical warfare”, on a “non-linear”/ “non-contiguous” battlefield. Although “Cold War Theory” does provide a plausible explanation of the U.S. Army’s ineptness in conducting

counter insurgency operations in Vietnam, Iraq, and Afghanistan, it does not provide a thorough explanation for the convoy security gap.

There are several flaws in this theory including the fact that deep attacks in the enemy's rear were a hallmark of Soviet doctrine and supply line interdiction is mentioned in some Army publications. The most salient flaw in this theory is that it assumes that attacks on supply lines do not occur in conventional warfare or on a linear battlefield and are a phenomena associated only with un-conventional warfare or counter-insurgency operations. As stated earlier, the notion of a rear secure area was created during the trench warfare of the First World War. Technological advances virtually removed maneuver from the battlefield during World War I and created a true linear battle ground with a secure rear area for trains which was codified in Army doctrine. During the interwar period and the early years of World War II, maneuver warfare was brought back to the battlefield with the advent of advanced tanks and effective combined arms operations which nullified the concept of a secure rear. However, due to a lack of attacks in the American rear, the supposition was thought to still be valid. By then it was so imbued into U.S. Army culture it was easy to ignore the numerous attacks on supply lines during the Korean War and write off the Vietnam War as an anomaly.

With this understanding of the precariousness of the rear area on linear battlefields it is easier to ascertain why Army convoy security doctrine was so incoherent. The Army did not fail to objectively analyze combat operations or ignore lessons learned on supply line/convoy security. The Army was aware that the rear area was not as secure as what was believed as early as the Vietnam War as illustrated earlier. The author posits that the issue was that the notion of the secure rear and the "R.E.M.F." was so imbued into Army culture that when force development decisions were made, which are zero sum, leaders were willing to accept risk in supply

line/convoy security and support operations in general.⁵³ Years of taking risk in this critical capability led to inadequately trained and equipped forces as witnessed during the initial months of OIF.

This excerpt buried in Appendix O, of FM 55-30 (1997) which was the latest version during the initial invasion into Iraq bolsters this hypothesis: “Logistical convoys cannot always depend on military police support or added firepower. To provide more firepower for a convoy, units developed the gun truck.”⁵⁴ The appendix then allocates three paragraphs to discuss the use of gun trucks in Vietnam. This shows that force developers were aware that the convoy/supply line security concept was deficient in force structure as learned in Vietnam. Furthermore, the efficacy of the gun truck is mentioned, but there are no authorizations for Soldiers to train on this capability. Did the Army believe that Soldiers would be able to find additional ring mounts, crew serve weapons, steel plates and other needed resources as well as be able to train on this capability once they were in a combat zone?

This culture of accepting risk in logistics was exemplified during the invasion of Iraq when the CFLCC commander, LTG McKiernan deliberately assumed the risk of unsecure supply lines.⁵⁵ In singularity this decision probably would have not been significant but when compiled with the risks taken in logistics over the prior 70 years could have led to mass catastrophes such as the 507th Maintenance incident. Accordingly, LTG McKiernan considers his decision to halt the advance and assign the 82nd Airborne to V Corps in order to secure the supply lines the most important decision he made during the operation.⁵⁶

Recommendation.

Although the U.S. Army has taken several steps to resolve the identified capability gap including placing convoy security on the METL of truck companies, developing a convoy

protection gunnery program and publishing training aids, these efforts have been implemented haphazardly. The convoy force protection concept must go through the force development model in order to coordinate these actions with other lessons learned and produce a coherent convoy security concept. To reverse several decades of mismanagement and to change the culture, this capability requires a total overhaul. This starts with the creation of a new MOS. Transporters are currently titled “Motor Transport Operators”. This has the connotations of a bus driver, not someone who risks his or her life in defense of their country. This should be changed into “Tactical Distribution Specialist” and each Soldier should be required to pass an annual combat skills test. The next section of this paper will use the DOTMLPF construct to produce a recommendation that resolves the identified capability gap.

Doctrine

As of January 2015, the U.S. Army has yet to produce a convoy security capstone publication. With the 2015, force modernization changes the U.S. Army fielded 13 Composite Truck Companies (CTC). These companies, which are reactivated and converted truck companies, consist of 20 CPPs and various distribution platforms. The Army’s plan is to increase the number of CTCs to 21 by 2018 with 13 being active component units.⁵⁷ This would give the U.S. Army 21 CTCs consisting of 20 CPPs each to escort 215 truck companies which is approximately one CPP for every 60 distribution platforms.⁵⁸ Although this is a good start, it doesn’t remedy the capability gap. The Army’s intent could be to only augment the MP’s capacity as both entities are now assigned convoy security on their METL, and the author has found no official document rescinding this task from the MPs. If this is found to be true then it is also ineffective, because it does not resolve the problem of the lack of organic defense.

Furthermore, this concept remains to be deficient in force structure as the MP corps continues to lack sufficient personnel and its active force is programmed to decrease by 11 percent.⁵⁹

A more feasible and suitable solution would be to give the convoy security mission solely to the truck companies as well as the capacity to defeat level II threats. The MPs should keep the route security mission and AO commanders should maintain responsibility for routes in their AO and providing a QRF. This would also alleviate any last minute surprises of non-availability as experienced during recent operations and create unity of command and effort in operations. ATP 4-11 Motor Transport Operations should be re-scripted to serve as the capstone doctrine and needs to be thoroughly revised to do so.

Organization

All motor transport units need to have the organic capability to defend themselves. This would be the most difficult part to implement as the Army is limited in its resources, but operations over the last 70 years have shown the need for this critical capability. To be effective reorganization requires the company to focus more on security than distribution. This is in consonance with the Army's view that motor transport capability can be rebuilt quickly which was used to justify the deactivation of all active duty truck battalions and the shrinking of the active duty force to only 18 percent of the Army's motor transport capability.⁶⁰ Understanding that the fiscal constraints of the Army does not facilitate motor transport companies qualifying each Soldier on a Vehicle Gun Crew(VGC), each truck company should be allocated 10 CPPs. This would produce a 1 to 5 protection to distribution platform ratio for most companies and larger companies could be tailored accordingly. Additionally, all the additional survivability, lethality and communication components of the CPP currently provided by TPE including FBCB2, CROW, Duke, Boomerang, and miner rollers would need to be fielded as part of the

system. Preferably these units would be resourced with MRAPs but as these vehicles are expensive to maintain using up-armored HMMWVs, would be feasible for training purposes. In this case at least two MRAPs should be allocated to conduct drivers training and familiarization. High dollar, low density items such as the PACBOT, Boomerang and UAV systems should be made available for training through the local AMC representative. Allocating CPPs to every truck company is also in line with the Army's strategy of relying more on contracted trucks, as executed in OIF and OEF, and increases the commander's distribution capacity by 333% if utilizing a one to five CPP to contracted truck ratio.⁶¹

Training

Training for the new MOS will start at initial entry. Convoy defense has been integrated into Motor Transport Operator initial entry training so it wouldn't be a total overhaul of the program but more of ensuring the latest equipment is available. Soldiers assigned to one of the 10 CPP platforms should be required to complete the VGC certification program outlined in TC 4-11.46, Convoy Protection Platform Gunnery, as well as Convoy Escort Team certification. The remainder of Soldiers in the company should be required to complete all tables, but be able to conduct live fire exercise via simulation which will not count as certification, but will ensure Soldiers are trained. It is also imperative that Soldiers are allocated the resources to train on the components of the CPP such as the survivability and communication systems. Additionally, a Convoy Protection Master Gunner's course needs to be developed and the skill identifier should be required for the Assistant Truck Master billet. There are currently several Training Aids, Devices, Simulators and Simulations (TADDS) available at this time. The issue in the past was domination over these resources by combat arms units. Doctrine and policy must allow and

require support Soldiers to utilize the full range of live, virtual, gaming and constructive training opportunities available.

Material

All resources in this recommendation have already been proven in combat, so there are no material requirements.

Leadership

With the new requirements placed on leaders in motor transport units a standardized leadership course needs to be created. This could be similar to the Mechanized Leaders Course and used to certify convoy commanders. Additionally, support leaders should be granted equal opportunity to attend leadership courses as their combat arms brethren.

Personnel

As stated earlier the creation of a new MOS is needed to facilitate the establishment of a new culture among distribution companies. The overhaul will also assist in the transition of focusing more on security, which is in line with the Army's move to use more contracted trucks. MOS 88M should be retitled "Tactical Distribution Specialist" as driving is just one of the several capabilities transporters must possess to accomplish the mission of enabling the operation reach of the combatant commander. There also needs to be another communications Soldier added to each company and an Electronic Warfare NCO added to battalion staffs.

Facilities

Motor transport companies already have the facilities to accommodate the CPPs. Additionally, most Army posts already have the machine gun ranges needed to conduct gunnery tables. What is needed is to ensure that units have access to training simulators such as the

Mobile Close Combat Tactical Trainer (MCCT), Virtual Convoy Operations Training (VCOT), Virtual Convoy Combat Trainer (VCCT) and the Engagement Skills Trainer (EST) 2000.

Conclusion

In closing, the supply line/ convoy security capability gap can be attributed to changes in Army doctrine following the lack of maneuver during World War I. These changes accompanied with the lack of significant attacks on supply lines during World War II imbued the notion of a secure rear within the Army. This fostered a culture in which LOC/convoy security was a low priority which led to an incoherent, inadequate and ineffective concept and created a capability gap. The Army failed to develop and integrate the concept across all domains of DOTMLPF which led to deficient force design/structure and contradictory doctrine. This included a paucity in the number of MP forces and lack of survivability/lethality resources in the truck companies. Due to the deficiencies in the concept, Soldiers entered the Vietnam War, inadequately equipped and untrained for the realities of combat. The transporters responded by developing a suitable and feasible solution to the capability gap through the creation of the hardened convoy and gun truck. Equipping truck units with the resources to organically conduct convoy security proved to be both efficient and effective and was validated by a force development concept team during combat operations. Nonetheless, Army leaders failed to institutionalize the concept through the force modernization process which led to Soldiers relearning these lessons during OIF. After numerous attacks on supply lines during OIF, transporters revived the concept and it proved to be effective once again. With the high number of attacks, and the media's growing attention, the Army was forced to redress the issue. It did so by equipping truck units with the resources to escort themselves and began sourcing truck units to theater to perform convoy security.

The Army's attempt to indoctrinate the numerous developments in LOC/convoy security over the past ten years has been haphazard. This can be attributed to failure to integrate across DOTMLPF and War Fighting Functions which further convoluted doctrine that was already incoherent. Additionally, truck companies have relied on TPE for the required resources to conduct convoy security throughout OIF/OEF. With operations in Iraq over it is important that this concept be institutionalize through the force development process and integrated across the DOTMLPF construct.

With the FY'15 force moderations the Army resourced the first transportation companies with CPPs with a plan to field a total of 21 of these composite companies by FY' 20.⁶² While the composite transportation concept is both a suitable and feasible solution to the capability gap, force structure remains deficient. In order to develop an effective solution, the Army must organically resource all truck companies with the capability to conduct convoy security operations. This would provide Combatant Commanders with greater flexibility and distribution capacity and also supports the Army's decision to rely more on contracted trucks. Opponents of this recommendation will argue that the Army cannot afford to implement these changes in a time of fiscal austerity. As stated earlier, this concept does not require any material solutions as it will utilize CPPs and auxiliary equipment acquired during the Global War on Terrorism. Additionally, there is no need for a personnel increase or construction of training facilities or other edifices.

If dissidents remain on the cost effectiveness of this concept the author would ask this party to conduct an objective analysis of distribution operations during U.S. Army campaigns over the last seventy years. By doing so they would soon ascertain supply line/convoy security, has continuously been a critical vulnerability for the U.S. Army although it has not always been

exploited by our enemies. With operations in OIF and OEF being broadcasted worldwide this vulnerability is now known by potential adversaries. Therefore it is imperative that the Army reform its supply line/convoy security concept and develop an effective solution to this identified capability gap. Providing transportation companies with the resources to conduct this task has been effective for over a decade now and is still being used in Afghanistan. With operations in Afghanistan coming to a close, it is of dire importance that this concept be captured through the force development DOTMLPF process to prevent future catastrophes.

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