

BACKGROUNDER

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An Everyman's Guide to Contested Logistics

Mike Jernigan

KEY TAKEAWAYS

Contested logistics is a complex subject that requires deliberate action and creative solutions for success in combat.

The battles for Guadalcanal and the Falkland Islands provide examples of the challenges encountered in operating thousands of miles from support infrastructure.

The United States Marine Corps expects to operate in, and is developing tactics and capabilities to complete its missions in, contested logistics environments.

"Robinson Crusoe should be required reading for anyone setting up an advanced base in the South Pacific Islands."

dmiral Earnest King, Chief of Naval Operations during World War II, is reported to have said, "I don't know what this 'logistics' is that [General George C.] Marshall is always talking about, but I want some of it." Eighty years later and on the cusp of different wars, the term "contested logistics" has the same simultaneous familiarity and mystery as did its grandfather term.

In 1917, logistics was explained in terms of a dramatic theater production: If strategy is the plot of a play and tactics becomes its actors, then "[l]ogistics furnishes the stage management, accessories, and maintenance. The audience, thrilled by the action of the play and the art of the performers, overlooks all of

the cleverly hidden details of stage management." Simply put, logistics "is the stuff that if you don't have enough of, the war will not be won as soon as." Continuing the play analogy, contested logistics can then be seen as if it were a traveling theater troupe performing a play in a different country with the lighting crew on strike while people are throwing rocks and the theater is on fire.

When tackling complex subjects, it is sometimes best to start by simplifying and understanding definitions. *Collins English Dictionary* defines *contested* as something "causing dispute or argument" and gives two definitions for *logistics*: "the branch of military science and operations dealing with the procurement, supply, and maintenance of equipment, with the movement, evacuation, and hospitalization of personnel, with the provision of facilities and services, and with related matters" and "the planning, implementation, and coordination of the details of a business or other operation." All three definitions help to explain what people mean by "contested logistics": the planning and prior coordination required to reload, replace, and repair necessary apparatus, accessories, and individuals in combat while somebody is using lethal force in an effort to prevent this from happening.

The Six Functions

The Marine Corps uses a framework of six functions, some of which are not common in a commercial application of "logistics," to understand and execute logistics: supply, transportation, maintenance, general engineering, health service support, and services.⁷

Supply. This is the easiest function to understand and accomplish. It is the "things" that are needed: food, water, bandages, replacement parts, etc. Chief among equals are the commodities of fuel and ammunition. While the value of fuel and ammunition is obvious to modern readers, any commodity could become the "most needed thing in that instant" as the ancient author of the proverb "for the want of a horseshoe, a kingdom was lost" highlights. Whatever the circumstances were, horseshoes were the author's priority, but he probably also needed nails, replacement hammers, and more blacksmiths, none of which were the fuel of the day (hay), as well as ammunition (most likely arrows). The point is that some requirements of supply are obvious, and others require careful planning to unveil their critical importance.

Think about an emergency room doctor. The patient probably needs a good resupply of liters of blood. The doctor worries: "Wait, it comes in different versions? A, B, O, AB? And there is a plus or minus variability of each of those options? Give me all of it; I don't know who is coming in next."

But if we change the requirement to the perspective of the person on the table and make you that person, and if, instead of an emergency room in a city in America, we call it a Forward Resuscitative Surgical Suite (FRSS) and put it on an island in the Pacific Ocean that you had never heard of before it was in the news last month, then perhaps five liters of B+ blood becomes the most important thing in the world to you.

If we then add to our imaginary model six people on tables next to you (none of whom have B+ blood types), an expectation that more people needing blood will arrive in two hours, and the realization that your FRSS is only one of three separated by 200 miles of ocean and they all need liters of B+ blood, we begin to understand the challenges of contested logistics. And remember: Supply is supposed to be the easy part.

Transportation. If supply is making sure the "needed thing" exists and is readily available, transportation is the function of making sure that those things get to where and when they are needed. It includes the method and means and any special containers or considerations to move supplies, equipment, and people to other locations. Transportation encompasses the entire spectrum of global transport from ports, long-haul aircraft, and cargo ships to the last tactical 300 meters in backpacks, on bicycles, or with robots. Travel distance and special requirements are sub-elements of transportation: 500 Marines travel 500 miles in a different "container" than do 500 gallons of fuel or 500 pounds of Meals Ready to Eat.

Transportation is the functional area of logistics that most benefits from creativity. The Viet Cong and North Vietnamese Army famously used bicycles to move supplies along the Ho Chi Minh Trail out of sight and protected from American airstrikes. Again, our imaginary liter of B+ blood provides an example. It is easy to trace the process in normal circumstances. It starts in a liter bag in a hospital and then is moved by cart to the emergency vehicle entrance bay, loaded into a truck, driven to the airport, loaded onto an airplane, flown to an airfield, transported across the flight line to a helicopter, flown again to a ship, transferred to a smaller landing craft, and delivered to the island where the doctor is waiting: all pretty routine. We can add the requirement of refrigeration (a cooler, refrigeration trucks, etc.) to keep the blood fresh along the entire route with only minimal complication. However, challenges begin to arise at one or more of the intermediate stops where airplanes are down for maintenance, refrigeration units lose electrical power, and international customs agents declare your liter of blood hazardous material and refuse to allow it into the country. Things look bleak, particularly since blood has a limited shelf life.

It is now time to apply some creativity. What if we changed the container in which the blood was transported—perhaps to its original one? It becomes

easier to transport people with B+ blood than it is to transport the liter bag: No refrigeration is required, there is no expiration date, there are no prohibitions on transporting hazardous materials, etc. Other requirements like food, a place to sleep, and transportation for a person will have to be addressed, but that all becomes more routine problem-solving. We get the person with B+ blood to the doctor who is working on you, and she draws it from the donor and transfuses it to you. This flexibility of transport is one of the reasons Marines have their blood type on their dog tags and identification patches.

Maintenance. Maintenance is the function of logistics that involves keeping equipment operational and repairing it for reuse. It has a direct effect on the supply and transportation functions: The better equipment is repaired, the less material needs to be transported. It is easier to keep a missile launcher working correctly or to repair it rapidly than it is to acquire another one and transport it to Robinson Crusoe's island.

Maintenance can be as simple as replacing a battery or changing a flat tire. It then moves up in complexity: Batteries can be recharged, tires patched, wiring replaced, engines rebuilt. At the high end of the maintenance spectrum, parts need to be manufactured, sub-components need to be repaired, and software needs to be rewritten. Maintenance has a high personnel cost. All different equipment types require people with specialized training to conduct them; the skills needed to repair the engine in a diesel boat, for example, are different from the skills needed to repair the optics on a missile launcher or troubleshoot code on the radar system.

Some elements of maintenance in austere environments are different from more traditional logistics. Among these elements are scavenging and cannibalizing. Scavenging is finding what is needed to create or modify resources either in the local environment or by capturing enemy equipment or recovering abandoned equipment from displaced residents.

Cannibalizing is taking replacement parts from battle-damaged equipment and using them to keep other equipment operational. Marines of the "Cactus Air Force" did this during the battle of Guadalcanal in 1942. They kept planes flying by harvesting parts from those that were destroyed by enemy attack. They also added an element of deception by arranging the derelict aircraft in parking formations as if they were functional to get the Japanese to expend their bombs on nonfunctional aircraft. That technique, while it made the gathering of spare parts more difficult as they frequently were spread over a large explosive radius, also mitigated the need for other spare parts and repairs by reducing the number of attacks on fully operational aircraft.

General Engineering. The first area of Marine logistics functions that differs from conventional or business definitions of logistics is general

engineering. The two most common general engineering tasks are building survivability positions for and providing utilities to the Marines completing the assigned mission and providing the other functions of logistics.

Survivability is the "hardening" of a position to give the Marines a better chance to survive an attack. It involves construction both above and below the ground. Above-ground construction is easier to recognize as it involves structures built to protect people from the elements but also with overhead cover to protect from shrapnel; below-ground construction involves digging holes so that Marines are below the surface of the ground and protected from indirect fire. Marines call these holes fighting holes rather than fox holes: Foxes hide in holes; Marines fight from holes. Larger holes in the ground require reinforcement to prevent them from collapsing. If your work, for example, was a priority mission and needed to be on an island in the South China Sea inside a Weapons Engagement Zone, and if the Marines had to put your office underground to keep your mission operational because of a contested environment, shoring beams would be required to keep it from collapsing, drainage work would be required to keep it from flooding, air circulation work would be required to keep it from becoming suffocating, and electrical power would be needed to provide lighting and access to our systems. All of those details are encompassed by general engineering.

That electrical power requirement in our imaginary deployed workspace is a facet of the other main aspect of general engineering: utilities. Think of everything our county provides where we live; electrical and potable water services come most readily to mind. Other necessities are included in this category as well. Drainage from our imaginary underground office in a combat zone is considered a utility, but so are sewage and the disposal of medical waste.⁸

Almost everything in modern combat except for a rifle—the refrigeration for your liter of B+ blood, the communications to discover when it is going to get here, the radar to detect incoming enemy aircraft, the anti-ship missile system to put adversaries at risk, the lights so work can be done 24 hours a day—requires electricity from mobile electrical power generators. Drinking water is a similar but underappreciated necessity for modern combat operations. Everyone learns in the sixth grade that the human body can go only three days without water; Marines need to drink *three gallons* of water a day to remain effective. A gallon of water weighs 8.3 pounds. A hundred people on a Pacific island therefore need 300 gallons (7,500 pounds!) of water—every day.

This level of consumption adds particularly to supply and transportation requirements. Water is another special category of supply; it cannot be compressed, requires special tanks for transport, and is heavy. As much as I might like the elegance of this proposed solution, I cannot spray water

inside a cargo aircraft and fly it to you and then make it rain on your island. Marine Combat Engineers therefore use reverse osmosis purification technologies to convert brackish or salt water into potable water. This science reduces the supply and transportation challenges of water but creates its own on-site storage challenges that must be overcome. The Marine Corps uses portable rubberized tanks that roll up when empty.

Health Service Support. This is another aspect of military logistics that has no ready equivalent in commercial definitions of logistics. Health service support can be thought of as "maintenance for people." When you get sick, you wait in a doctor's office; when you need stitches, you go to the emergency room; when you crack a tooth, you head to the dentist. Your employer probably provides a health care plan that not only subsidizes the cost for you, but also enables you to leave work to see the specialist for each of those "common" emergencies.

Deployed Marines face all of the same common challenges, but unlike most other people, they cannot leave work to keep an appointment. Therefore, those specialists must be brought with them, and planning must include their capabilities. The FRSS provides an example, but so do the Preventative Medicine Technicians who make sure the water is safe to drink, food is safe to eat, and insect vector populations do not carry disease and the veterinarians who care for military working dogs. More Marines on Guadalcanal were incapacitated by malaria than by gunshot wounds, and more service dogs died in Vietnam than died in any other war.

Services. The final functional area of Marine logistics also has no equivalent in civilian logistics. Services encompasses routine chores such as delivering mail and paying people that are accomplished by small towns and large companies. In the Marine Corps, a Contracting Officer has a warrant and is legally allowed both to obligate the United States and to pay on behalf of the United States. He has a bag of money, a credit card, and the authority to make his own deals in the interest of the United States and under the direction of his Commanding Officer. These on-the-spot deals can range from securing port access from a foreign government to buying food from a local farmer.

This capability provides tremendous flexibility to deployed Marines in solving both large-scale and small-scale problems. An example is seen in the closing days of the invasion of Iraq. A month into the war (and before we knew we would be there for years), the 1st Marine Division occupied Baghdad. The Republican Guard had abandoned their uniforms, organized resistance had crumbled, and Saddam Hussein was in hiding. The Division had a single Contracting Officer, and that Marine, in that season, did more with his bag of money to secure the safety of the Division's Marines than did many artillery batteries.

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Another important service is mortuary affairs. Proper burials are important not just because of the obvious health implications for the living. Marines fight better knowing that their remains will be respected, their families will be notified, their personal effects will be gathered, and their friends will be given a chance to mourn when appropriate. It is part of the social contract that America makes with her Marines: If you fall in the service of our country, we will make sure that your remains are cared for and your family is treated with dignity. Perhaps it is this most important of services that best captures the difference between military and civilian logistics.

We begin to understand the complexity of military logistics by reviewing our fictional scenario. We started with a liter of specific blood that somebody needed on an island in the South China Sea. The blood was sourced and transported to an austere location because aircraft and vehicles were maintained and functional. It cleared customs in an intermediate country because a Contracting Officer paid a fee and made a problem go away, and it was delivered to a field emergency room that was dug underground and had electricity to power tools that a surgeon, anesthetist, and emergency room nurse used to transfuse the blood into the patient. Those medical personnel could do this because they slept in a bunker protected from shrapnel, were eating regularly, and were able to drink their fill of fresh water.

The good news is that this imaginary patient survives in our scenario. The bad news is that at every step of the way, an adversary is trying to stop that blood from reaching its destination. Ships are sunk, helicopters are fired upon, invoices and manifests are hacked, viruses are injected into navigation systems, Marines are shot at, positions are shelled, islands are targeted with missiles, and doctors are poisoned. It does not take an active imagination to calculate how many of those steps need to be disrupted for blood not to arrive in time or perhaps not at all. Welcome to contested logistics.

Guadalcanal and the Falklands

The term "congested logistics" is relatively new, but the concept is not. People have been trying to break each other's stuff in conflict since the first Bedouin shot an arrow into a rival's camel or an Egyptian knocked over a chariot filled with spears.

Both sides in the battle for Guadalcanal in 1942 had to address the challenges of contested logistics and tried various creative solutions. ¹⁰ The Japanese controlled the sea lanes around the islands at night and used destroyers to resupply their garrison by throwing overboard 50-gallon drums, lashed together with rope and full of food and ammunition, to wash

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ashore and be recovered by soldiers. The Americans controlled the sea lanes during the day and used submarines to resupply and move Marines around to different locations. Barges that the Japanese tried to tow behind submarines were sunk.

Ultimately, the Americans were more successful in resupplying the Marines with needed food, fuel, and ammunition. At the end of the fivemonth battle, the surviving Japanese were in poor health and starving, and more than 4,000 Japanese soldiers had been lost on sunken ships before they could reinforce the beleaguered garrison.

The Falklands War between Argentina and the United Kingdom provides another example of one side better addressing the challenges of contested logistics. The Falkland Islands are an overseas British territory off the southern coast of Argentina and on the doorstep of Antarctica. In 1982, the Argentines invaded the islands and expected the British to be unwilling or unable to resist. Instead, the British mounted an 8,000-mile expedition on short notice to free its citizens. For the British, it was "a 'come as you are, bring what you can' affair" highlighting the difficulty of contested logistics over long distances and austere environments. For the Argentines, it was a lesson in leadership failures and an inability to resupply the necessities of modern combat: food, water, fuel, and ammunition.

The Argentines had five modern Exocet ship-killing missiles and scored hits with all five, damaging three ships and sinking a fourth. The fourth ship had the entire fleet of light helicopters and all save one of the heavy helicopters aboard when it was sunk; its loss therefore had a significant impact on the British logistics plan. Unfortunately for the Argentines, however, that attack proved to be the high-water mark of their contested logistics efforts because they were unable to reinforce or resupply their forces defending the towns and high in the mountains. After each successful battle, the British forces found their adversaries near starvation, without sufficient clothing for the sub-Antarctic winter, and low on ammunition and morale despite full warehouses of food and winter clothing.

The British had their own logistic challenges. Because the war was a short-notice affair, they pressed civilian ships and cruise liners into service as logistics ships. These ships were not purpose-built to offload supplies or vehicles, so they had to come pierside to unload. However, the Argentines' successful attacks on ships caused them to be considered too vulnerable to come into the coastline. Accordingly, they were kept out of missile range and far out to sea where smaller ships had to come alongside and arduously cross-deck supplies and ammunition and then make runs toward the coastline. These smaller ships then had to be unloaded by hand at the port.

There were two related consequences of this cumbersome process, particularly as the British ground forces were advancing away from the port. Needed supplies were jumbled at the beach and vulnerable to successful Argentine air attacks, and—most important—the advancing forces did not have the necessary ammunition and equipment to support their operations. The Royal Marines employed multiple low-tech solutions to their logistic challenges: They scavenged winter clothing from deceased Argentine soldiers, used farmers' tractors to get through bogs, and set up a network of runners to hand-carry ammunition needed for the next attack. Ultimately, the British proved to be more adept at overcoming contested logistics challenges, accomplished their objectives, and defeated the Argentines in the 74-day war.

Overcoming Challenges in the Current Operating Environment

United States Marines learn both from history and from studying the current environment. In May 2025, the Commandant of the Marine Corps told congressional defense committees about several of the methods the Corps is using to overcome the challenges of contested logistics in the current operating environment. In the supply realm, the Corps is expanding its network of prepositioned stocks and equipment around the Indo-Pacific region to reduce both the vulnerability of and the time required to resupply critical resources. With respect to the transportation function, the Corps has fielded 500 Ultra-Light Tactical Vehicles to go where larger vehicles cannot go; has more than 60 unmanned aerial resupply systems to deliver fuel, ammunition, and replacement equipment into hazardous environments without risking the safety of human pilots; and, along with the entire Joint Force, is experimenting with autonomous low-profile vessels to deliver supplies along contested shorelines.

The Marine Corps is innovating across the maintenance and health services functions as well. Marines are using portable fabrication labs to create replacement parts while in the field to increase flexibility and shorten delivery times. In partnership with the Navy, Marine logisticians are building smaller but more capable mobile surgical teams and developing new techniques for long-range casualty evacuation.

In addition to the many advances in contested logistics, the Commandant also described some of the challenges the Marine Corps faces. The first involves the Maritime Prepositioning Force (MPF). The MPF is a program of ships that are filled with Marine equipment and stationed around the

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world. This enables them to respond rapidly to a crisis and reduces the time needed to load and transport equipment from the Marines' homeport. In the past 10 years, the MPF fleet has been reduced from 16 ships to seven ships, and the result has been nearly a million square feet of lift reduction.

The Corps currently has two MPF squadrons, each of which can support a Marine Expeditionary Brigade (MEB) of up to 16,000 Marines for 30 days. The Corps also has three standing MEBs and can field nine other MEB-equivalent units on any given day. Thus, there are 10 more MEBs and MEB-equivalent units than there are MPF squadrons to support them. At a minimum, it is reasonable to require that each of the three standing MEBs has its own dedicated MPF squadron as each did in the past. Consequently, Congress should fund the construction of a third MPF squadron (four ships) to ensure that each of the Corps' existing MEBs has the equipment needed to respond on short notice to crises anywhere in the world. As the MEB in Japan is the one missing its associated MPF squadron, the third MPF squadron should be stationed on Guam, on Saipan in the Northern Marianas, or in Sasebo, Japan.

A second challenge the Corps faces is the delay in fielding Landing Ships Medium (LSM). Of significant size but smaller than amphibious warships, similar to Coast Guard cutters, LSMs have a relatively shallow draft and the ability to load and offload cargo rapidly. LSMs are designed to move between islands, offload from bigger ships as the British did in the Falklands, and get close enough to shore to resupply Marines in quantity and at speed. As the Commandant told Congress, "supporting contested logistics at scale is only achievable with the LSM—the LSM is our bid for success."¹⁴

LSMs are essential for moving Marines and equipment rapidly between islands and for supplying and resupplying them. The "first island chain" is a term used to describe the string of islands that connect Vietnam, the Philippines, Taiwan, and Japan. Both the People's Republic of China (PRC) and the U.S. and its allies view this imaginary line as critical to the defense of Taiwan. The PRC wrongly believes that everything inside the first island chain is its property; the United States supports freedom of navigation and the sovereignty claims of the smaller countries. In either case, movement within the first island chain during conflict will be contested, and the LSM will fill a critical need by rapidly resupplying Marines.

The United States Navy anticipates a requirement of 18 to 35 LSMs with four produced each year. ¹⁵ However, the LSM program is currently paused because of disagreements involving cost and capability. To address this gap, the Marine Corps has purchased two Ancillary Surface Craft (ASC) from the Australians. ¹⁶ The ASCs can carry 40 Marines or 54 tons of cargo and

have bow ramps to offload cargo and disembark Marines. These small ships will be used to continue testing and experimenting as contested logistics doctrine is written and refined.

What Needs to Be Done

As noted by the Commandant of the Marine Corps, in addition to its many advances in contested logistics, the Corps faces several challenges. To address these challenges:

- Congress should fund the creation of a third Maritime Prepositioning
 Force squadron and the equipment required to fully load the squadron's ships in order to restore support to the Marine Expeditionary
 Brigade in Japan for contingency use.
- The Department of the Navy should resolve the capabilities dispute regarding the Landing Ships Medium and submit the final design to Congress for funding.
- Once funding is secured, construction of Landing Ships Medium should be accelerated.

Conclusion

There is a series of thought experiments around the hypothetical question, "What would you take with you if you were on a deserted island and you were allowed only xx items?" These academic quandaries are used to teach subjects ranging from critical thinking and problem-solving to creativity and ethics. However, for Marines operating in contested logistics spaces, these questions are neither academic nor hypothetical. Marines are working deliberately and creatively to overcome all of the practical challenges that are inherent in modern warfare—particularly those that involve fighting on foreign shores far from home and far from islands that Robinson Crusoe would recognize.

Mike Jernigan is a Visiting Fellow in the Douglas and Sarah Allison Center for National Security at The Heritage Foundation. He served in the U.S. Marine Corps for 30 years.

Endnotes

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