Light Infantry Logistics

Transforming from the Global War on Terrorism

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Mountainous terrain has proven to be the ultimate combat and sustainment equalizer, but the U.S. Army's 10th Mountain Division has been "flattening" mountainous and alpine terrain for the U.S. military's ease of access since its inception in 1943 during World War II. During the Global War on Terrorism (GWOT), the 10th Mountain Division executed numerous deployments to Iraq and Afghanistan. Adapting to the nature and environment in both nations, the 10th Mountain Division's logistics and sustainment leaders enabled combat operations through tactics, techniques, and procedures requisite with the requirements of the times. The way sustainment was executed over the last two decades, however, cannot be the way the Army will provide sustainment for today's environment.

Pivoting away from the GWOT's sustainment structure while gleaning lessons learned from the mountains of Afghanistan to enable operations in alpine terrain remains key to the division. The division defines "alpine" as the mountains and highlands spanning from three thousand to six thousand feet in elevation with severely restrictive terrain and reaching subzero temperatures. To overcome the associated challenges and prevent higher-elevation terrain from becoming an inaccessible obstacle, a layered and redundant sustainment approach is required for mission accomplishment.

The 10th Mountain Division seeks opportunity from the challenges this terrain presents. U.S. adversaries like China and Russia believe they can use mountains, alpine, and arctic terrain to render current U.S. technological advantages null and void by leveraging

Representatives from U.S. Army Combat Capabilities Development Command Army Research Lab and the Civil-Military Innovation Institute met with 10th Mountain Division (Light Infantry) soldiers to discuss emerging technologies at the first Innovative Technology Symposium 15 April 2024 at The Peak. The 10th Mountain Division Sustainment Brigade hosted the symposium, which highlighted the division's contributions in field-testing a resupply drone, the Tactical Resupply Vehicle 150, and establishing a new innovation lab on post where soldiers can work with experts to problem-solve and develop real-world solutions. (Photo by Mike Strasser, Fort Drum Garrison Public Affairs)

the environment through their own innovation. Examples are particularly seen after China's own experiences posturing in the mountains along the border with India and Russia's historical lessons learned fighting in Afghanistan.[1] Although not high in altitude but more recently, Russia continues to innovate in the arctic and high north regions to increase strategic global access and area denial.[2] Conversely, the 10th Mountain Division aims to keep the terrain flat for the United States and its partner nations while keeping the mountains impenetrable to its adversary's advances and preserving the U.S. and partner nation's military overmatch capabilities. Reimagining and creating logistical support methods in the alpine fight requires many components of sustainment to adapt. Accordingly, we can increase freedom of action by improving operational reach, prolonging endurance, and adapting systems and equipment to alpine conditions transitioning from the tactical to the operational levels of warfare. As an automatic consequence, we've learned from recent history in the mountains of Afghanistan. We will innovate sustainment capacity with a renewed vision by focusing on the most demanding environments possible to preserve our overmatch.

The Requirement for Specialization Drives Adaptation

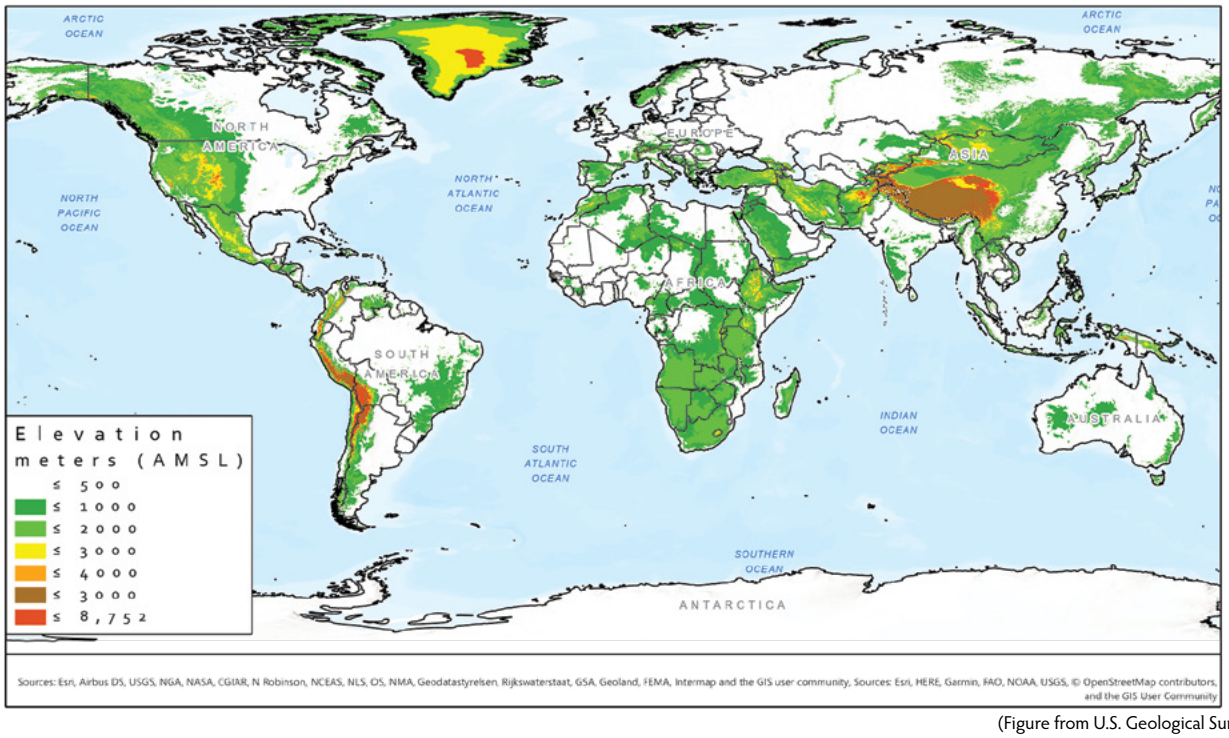
To survive the security environment of the future, we will be forced to pivot from the sustainment construct introduced and inculcated throughout the last two decades in the GWOT. Recently, Army senior leadership published a leaflet to the force highlighting their vision for the Army and four key focus areas. Of the four areas, our leadership emphasized, "Local

A Tactical Resupply Vehicle 150 with a bundle of Meals, Ready-to-Eat flies above a training area on Fort Drum, New York, 5 March 2024. (Photo by Sgt. 1st Class Neysa Canfield, U.S. Army)

leaders know best how to translate strategic intent into solutions at the local level," as well as transforming "to become leaner, more mobile, lower signature, and most importantly, more lethal. … The best ideas often come from the bottom up" and are now being integrated into the 10th Mountain Division by returning to its alpine roots.[3] Of note, the 10th Mountain Division's commanding general recently emphasized the need for "physically and mentally tough light infantry soldiers to go where the enemy cannot and generate asymmetrical advantages to win the next fight."[4]

Furthermore, reintegration of specialized combat divisions remains necessary to meet the world's current operational environment—particularly in alpine terrain. Take note of the terrain highlighted in green and bright green in figure 1.[5] These higher elevation areas cover land masses owned by U.S. adversaries, but more importantly, the entire west coast of the United States. Mastery of sustainment in such terrain becomes incredibly critical for offensive operations abroad and for the defense of our homeland.

The United States and its allies cannot afford to wait for the next fight to force the requirement to master alpine terrain; history has provided the cost of waiting. Emphasizing history for a focus on predictive readiness, one of the Army's senior logisticians mentioned in the Spring 2022 edition of *Army Sustainment* magazine, "Enabling readiness across the Total Army ensures the force learns from the past to accomplish today's requirements and prepare for future ones."[6] As an example, we can look back to history and the experience of Field Marshall Viscount William Slim, who led the Burma campaign against the Japanese and had to establish a specialized jungle school to train his personnel after they were defeated and pushed back to India.[7] Slim had to innovate during conflict, train his forces, and subsequently retake lost terrain and eventually Burma. Arguments exist that the original defeat would



(Figure from U.S. Geological Survey)

Figure 1. Mountain Regions of the World

have been a victory if soldiers and units were already proficient in jungle warfare.

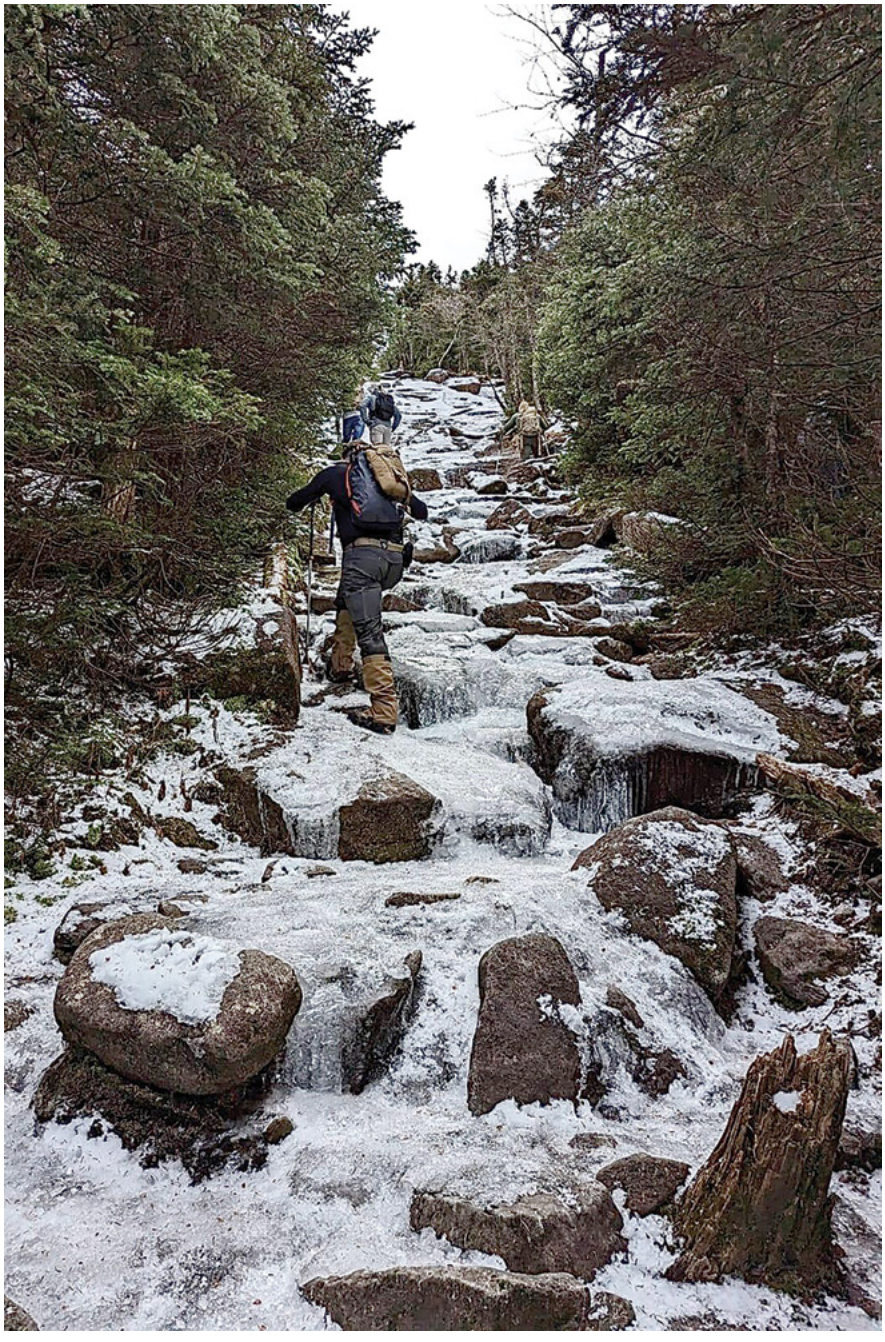
Likewise, when fighting an adversary in large-scale combat operations (LSCO), the wrong time to start focusing on the alpine environment proficiency is certainly when you are expected to fight there. In today's rapid tempo, we are required to be prepared now so there is no defeat before victory—there will only be victory. With that said, our current preparations remain paramount and predict the need to dominate in the mountains. Moreover, there remains significant mountainous and highland terrain features particularly located in and around the United States' competitor nations of China, Russia, and Iran.

Fortunately, the U.S. Army maintains historical and well-established relationships with nations located around our competitors, and with mutual support, it has established allied access to key terrain. Of major note is the newly added NATO ally, Finland—a key relationship for the NATO alliance and the 10th Mountain Division, especially as Russia's illegal war in Ukraine persists. The Army fosters relationships with allies that own the terrain and possess relevant experience and equipment for the environment. We continue to reminisce with and be inspired by Finland as the roots of the 10th Mountain Division were planted by a seed sown after Finland's success over the Soviets in 1939.[8] We are certainly stronger together, especially on the battlefield.

The New Vision: Alpine in LSCO

Before we reach the alpine battlefield, we need to predict, visualize, and experience the requirements and requisite solutions to its challenges to be successful. The 10th Mountain Division Sustainment Brigade owns this very sustainment transformation and currently leads the division's sustainment capability development, experimentation, and implementation. To this effect, the brigade collaborates with industry partners while integrating emerging technologies into current operations to set the battlefield.

The brigade recently returned from the Adirondack Mountains having gained an appreciation for the alpine environment and what it means for Army sustainment operations in direct support of a combat division in severely restrictive terrain.[9] The brigade's leaders identified key nuances with alpine operations while overlaying conceptual solutions to bridge perceived capability



Leaders from the 10th Mountain Division Sustainment Brigade, 10th Mountain Division, ascend a frozen creek bed during leader professional development training on 6 November 2023 in the Adirondack Mountains in New York. (Photo by Sgt. Dawn Bartlett U.S. Army)

gaps with the intent to layer logistical redundancy capable of providing prolonged endurance and options.

The need to become lighter in all aspects became apparent as leaders summited five mountains sprawling across New York's high peak region. Throughout the event, the physical demands of the terrain were high and immediately noticeable. The smallest overlooked details can have negative strategic effects. Forgetting cold weather gear at a lower elevation area might not be the problem at the base; however, when nearing a summit at an alpine elevation, weather conditions transform heavily to the point of rendering an individual combat ineffective while potentially creating a casualty. If all personnel lack the capability, the entire unit can quickly become combat ineffective—creating unintended vulnerabilities or preventing necessary combat action.

Second, the teams recognized the human element and requirement for superior physical fitness to simply survive in this environment and shoulder additional military gear up to the desired elevations. All these demands combine and ultimately add to the time that it takes to accomplish a mission. The team has also discussed opportunities with current technologies to streamline transportation and alleviate intense physical demands while being able to deliver sustainment requirements at the time and location needed for operational success.

Last, teams reflected on the current Army structure with detailed discussion on the forward-most sustainment units and how ineffective they would be with their current equipment set and construct while operating in the alpine environment. We cannot operate with the same GWOT materiel; vehicles and equipment need to become smaller, lighter, and have additional capabilities to leverage for operational redundancy in extreme cold weather and high elevation.

Forces operating in this terrain must account for these demands and variables from the time they step

off from the assembly area. This is not too dissimilar to what many can recall from the mountains of Afghanistan. Undoubtedly, our GWOT experience holds many valuable and relevant lessons, tactics, and procedures. However, we must acknowledge that the next fight will carry special nuances that will force many sustainers away from what they have grown proficient in and accustomed to.

GWOT Contrasted

This renewed focus and concept for the 10th Mountain Division to specialize and thrive in mountainous, alpine terrain aligns with the Army's pivot from counterinsurgency (COIN) to the multidomain operations framework, which highlights noncontiguous and dispersed operations and requires a fighting force that can be tailored to win in all environments against any adversary. The transition from contiguous to dispersed sustainment introduces a dilemma from recent wars within Iraq and Afghanistan that requires thoughtful reflection and experiential learning to overcome.

For example, during GWOT, the higher-level strategy focused on brigade combat teams as the primary fighting force. This strategy snowballed into a series of sustainment events that stockpiled materiel on forward operating bases. Organizations that come to be centrally located and static often become hyperfocused on amassing commodities and enabling capabilities. This culture enabled operational flexibility and increased efficiency and responsiveness. At the time, these added capabilities and large stockpiles seemed necessary, and they certainly enabled sustainers to fix forward, delineate between a push and a pull resupply, and provide a high level of predictability. But will this employment of sustainment prove feasible within the construct of how we envision our future employment to an alpine environment as a part of the greater LSCO fight?

When light infantry formations conduct offensive or defensive operations in alpine terrain during LSCO, the sustainment unit structure of the light infantry division must change. To prolong operational reach, the overall sustainment structure that remained through the GWOT—centralizing on the brigade combat team—must now be centered at the division level in alpine terrain while sustaining dispersed platoons and squads. During COIN operations, the brigade support battalions (BSB) were centralized in the brigade support area (BSA) at a forward operating base and distributed supplies and services to combat outposts according to the "hub-and-spoke" method. In LSCO, these BSBs will be aligned under the division sustainment brigade. This realignment to the Army's structure provides the infantry division's senior sustainment commander greater flexibility to tailor and position battalion-level sustainment units where the need is greatest. In essence, if the situation is warranted, the division sustainment brigade commander could surge all the division's sustainment capability in one location, link numerous BSBs together in series to span through lengthy movement corridors or organize the BSBs in parallel to support a wider front.

In addition to this change, forward support companies must become lighter and transition to a scaled and scoped alpine distribution company. This company would primarily be tailored to the specialized battalion that it habitually supports. Additionally, this company would be comfortable conducting operations in severely restrictive terrain while also possessing the materiel to thrive in a noncontiguous sustainment structure. To achieve its mission, the alpine distribution company relies on higher-echelon activities.

Supply Support Activity

Supply support to the front line is one of the most critical sustainment functions commanders and warfighters heavily depend on as it enables prolonged endurance. Considering the significant time-based challenges the division will face, logistics of supplies must be coordinated and monitored closely from the strategic to the user levels. During GWOT, supply support activities (SSA) would operate in a fixed location for years; however, in LSCO, SSAs are more likely to be displaced with their designated BSA as required to maintain operational reach. In such an environment that involves frequent displacement of the SSA operations, it is logistically ideal to run the SSA operation twofold.

First, the SSA operation and the authorized stockage list (ASL) will move forward with the BSA to maintain a push supply support method. The ASL for Class IX, repair parts and components, are kept in stock, readily able to fill immediate requirements for units as they conduct maintenance forward. In such a format, the SSA operates as the brigade's forward distribution point.

Second, another element from the SSA remains collocated with the division support area (DSA) and other resources to receive inbound shipments of supplies from higher echelons. This small SSA team would be part of a forward logistical element that adopts the pull supply support method. Supplies of clothing and equipment, construction and building materials, and repair parts requested by warfighters and not originating from the forward ASL at the BSA are processed and promptly shipped to the place of need. The second SSA element's critical task is to ensure the ASL replenishments are pushed forward to the SSA team. The push-and-pull method from two different locations is more effective when the sustainment brigade has the authority to position the BSA's SSA where desired.

The unique challenges presented by the alpine environment make supply support a crucial task. Incorporating the push-and-pull supply support concept into alpine operations will be heavily dependent on the availability of conducive locations as well as transport equipment and assets to overcome challenging rocky and mountainous terrain.

Transportation

GWOT forces primarily experienced established ground lines of communication for sustainment transport. Even in Afghanistan, where mountainous terrain encompassed the country, allied forces primarily used ground transportation routes and methods for transportation despite numerous aerial delivery options. The ability to use the ground lines of communication and the large vehicles for transportation allowed combat outposts to stockpile at least a week's worth of sustainment supply at a time. Although this sustainment construct enabled COIN operations, if overlayed with LSCO, combat forces would take a loss in freedom of action and speed of movement with such a large sustainment tail. We need to lessen our footprint, increase frequency of smaller deliveries to points of need, and foster a culture for being self-sufficient for key periods of time.

From the 10th Mountain Division's alpine perspective, gone are the days of long convoys in Afghanistan traveling down Kabul-Kandahar National Highway 1 from Forward Operating Base Airborne in Wardak Province to the gates of Forward Operating Base Ghazni (see figure 2).[10] Military and civilian vehicles utilizing ground lines of communication to transport personnel, equipment, and supplies to awaiting troops will no longer be feasible in severely restrictive terrain. While the corps support area and DSA may mirror current operations in the new LSCO environment, 10th Mountain Division soldiers will not be able to rely upon standard throughput or tailgate resupply operations with elevation. Instead, the Army will need to primarily rely upon air assets, innovative equipment, and possibly a larger return to pack mules. Conducting military operations in an alpine environment requires a closer look at all capabilities—both innovative and primitive. With soldiers seeking cover and concealment on the side of a mountain, standard vehicle traffic can often not traverse the terrain to their location. From experience, training in the Adirondack Mountains as a proof of concept, getting the necessary supplies that would be required for the infantry will be no easy task. Moving a case of rations or a couple of ammo cans by foot will prove challenging even for the fittest soldiers.

Due to the nature of the environment and limited traffic in an alpine environment, the Army will have to rethink how best to conduct continuous sustainment operations without using standard vehicles. Depending on maneuverability, moving subsistence and munitions by foot could prove feasible, but the increased weight and rough terrain makes this difficult. Smaller all-terrain vehicles could prove to be a solution, but only if paths exist or are established by engineers.

For example, the first mile of the Adirondack's second-highest peak—Algonquin, at 5,114 ft. in elevation—only allowed for movement on foot. No ground piece of equipment in the Army catalog would be able to maneuver on this trail without significant improvement. Within the second mile, the terrain quickly changed to a creek bed littered with massive stones, making all vehicle movement impossible without clearing and leveling. A challenge like this brings us quickly back to hauling supplies by foot or visiting historical methods by using pack mules. By the third and fourth mile, the terrain became increasingly difficult to navigate with just a small amount of weight, and it was so steep that even mules would have difficulty traversing. Add in inclement weather and ice, and there is no safe way to physically carry the number of supplies required at the speed it is required to conduct any sort of sustainment operations.

(Route imagery from TerraMetrics; map from Google)

Figure 2. Convoy Route from Forward Operating Base Airborne to Forward Operating Base Ghazni

Therefore, the Army needs to look more closely at aerial delivery operations to sustain in alpine territory. Current rotary-wing capabilities enable sustainment to drop Low-Cost Low-Altitude and Containerized Delivery System bundles at higher altitude for front-line unit resupply. Fixed-wing aircraft can accomplish the same types of operations as well as drop Containerized Delivery System bundles utilizing Global Positioning Systems if the Joint Precision Airdrop System is available. Even in an air parity environment, innovative technologies like the Tactical Resupply Vehicle (TRV-150) would be able to provide supplies to our soldiers at these altitudes while minimizing risk to aircraft. These types of systems are needed with volume, especially as air superiority remains in question.

These are just some of the systems required in a contested logistics and alpine environment utilizing both ground and air lines of communication to sustain the warfighter while enabling freedom of action.

Maintenance

Eighty years ago, the U.S. military considered how it could help fight in World War II by crossing the Italian Alps. The 10th Mountain Division trained for sixteen rigorous months in Colorado, honing their warfighting skills in mountainous terrain. Numerous lessons were learned while the 10th Mountain was in the Rockies, such as "a soldier's rate of dismounted movement in mountainous terrain slows with the increase of altitude and slope so much that routes in mountainous terrains are measured in time not distance."[11]

Not only is the movement slower, but the elevation can also affect weapons, vehicles, and soldiers. The elevation can affect how a weapon shoots as well as how trucks start and run. The steeper the climb, the harder it is on vehicle components. We have learned how the weather at higher elevations can become colder quicker, and that extreme cold will make metal and plastic more brittle and easier to break. Because of these limitations, more maintenance iterations for the equipment used at higher elevations will be needed.

The freezing temperatures, winds, and elevation will all play into the performance of equipment. For example, night vision and optical sites will fog more frequently with changes in moisture and will need to

be purged more often. When used, trucks will have to work harder to go up steep terrain and will have to take additional trips to get the same amount of equipment to forward troops than on flat ground. Maximizing carried weight by robotics and unmanned aerial vehicles will increase the wear on components of the equipment while slowing them down during use. This will require the maintainers to ensure the equipment is serviced more frequently and to have the capacity to quickly procure replacement parts through supply systems using tactical-level transportation.

Field Services

During the GWOT, the Army was accustomed to operating on permanent bases using contracted support to feed the warfighter in the field. The military leveraged contracted support to decrease troop presence and subsequently to do everything from housing troops to rebuilding airfields and standing up dining facilities. The contracting solution was known as the Logistics Civil Augmentation Program, or LOGCAP, a type of umbrella contract the Army had been using to support its military bases overseas.[12] A feeding service that is typically conducted by service members was largely contracted out during the wars in Iraq and Afghanistan. Freeing up Army culinary specialists to perform other wartime duties like performing gunner, entry control point, and guard tower duties.

Unlike the wars in Iraq and Afghanistan, a large-scale ground combat operation against a near-peer adversary will look a lot different. U.S. adversaries are extremely capable with state-of-the-art long-range and short-range missiles, and they are equipped with modern air forces, making staying in one location for any extended period much more dangerous than in the GWOT. The Army's continuous transformation plan and the Army Concept for 2030 reorganizes and reduces equipment, leading to a lighter equipment set for light infantry divisions.[13] However, one thing that will not change with continuous transformation is the requirement to provide calories to the warfighter. Culinary specialists will need to be engaged in their military occupational specialty to ensure that the warfighter has the calories to sustain fighting in LSCO.

Army field feeding operations will look much the same as they do now in the DSA and back. Culinary leaders will establish field kitchens and utilize fixed facilities that can be acquired to support on an area basis. Forward of the DSA and as maneuver formations move into restrictive and severely restricted terrain, field feeding operations will have to adapt to support the warfighter. Hot food may be transported and carried up mountains using TRV-150 drones. Infantry troops will have to carry Meals, Ready-to-Eat (MREs) or First Strike Rations (FSR) in their rucksacks to ensure they are self-sufficient.

The Joint Culinary Center of Excellence has developed the Unitized Group Ration-Express (UGR-E). The UGR-E is a compact, self-contained module that provides a complete, hot meal for eighteen soldiers and weighs up to forty-five pounds. With the simple pull of a tab, the food is heated in just thirty to forty-five minutes and is served in trays to soldiers like a formally prepared meal. The capability afforded by the UGR-E offers an alternative to individual meals as the sole source of subsistence in austere, remote locations. Mountain soldiers may utilize a combination of MREs and FSRs that are carried with them and transported food mixed with a shipment of UGR-Es to support their caloric needs when operating in restrictive terrain that does not support larger field feeding team equipment.

As the 10th Mountain Division transforms into the Army of 2030 and becomes lighter, restructured, and specialized in alpine environments, it will need to get creative in the way it feeds its soldiers. Through a combination of MREs, FSRs, UGR-Es, and traditional UGRs in conjunction with new and old transportation methods, the 10th Mountain Division will have the fuel it needs.

Sustainment Communications

During the GWOT, forces maintained a nearly constant ability to interface with higher-level command-and-control sustainment reporting systems through dedicated network connectivity, supporting the sustainment system by maximizing responsiveness to the point of requirement. Having the near-constant ability to be "plugged in" prevented the need for forces to innovate to collect and transmit accurate sustainment information.

Logistically, operations rely on communication and the ability to capture immediate requirements, expenditures, and forecast upcoming needs. Most logistical

A Boeing CH-47 Chinook helicopter from 3rd General Support Aviation Battalion, 10th Aviation Regiment, 10th Combat Aviation Brigade, 10th Mountain Division, drops Meals, Ready-to-Eat bundles on 19 July 2023 over a training area near Fort Drum, New York, as part of low-cost low-altitude training for soldiers of the 10th Mountain Division Sustainment Brigade. (Photo by Sgt. 1st Class Neysa Canfield, U.S. Army)

communication platforms were previously developed to support stationary support activities in a lower-threat area. However, robust infrastructure capable of conducting uninterrupted and robust sustainment operations is unlikely in mountainous terrain during LSCO—near-peer adversaries now have the ability to jam, mountains block radar and radio communications, and current equipment presents itself too cumbersome for the alpine fight.

In today's security environment and while preparing for the next fight, Army leaders are actively addressing concerns regarding contested logistics while encouraging innovative activities and developing redundancy in systems that provides the flexibility for forces to continue operations despite potential setbacks.[14] One such concern was cyber and network security. The Sustainment Automation Support Management Office (SASMO) did not initially emphasize cyber security and network security for the Army's life support systems. The devices that were authorized network access were managed at the unit level. However, 10th Mountain underwent network and security changes to make network access stricter. This inherently took away some administrative rights from the users, but ultimately was a step in the right direction for network and cyber security.

In a paper published by Maj. Gen. Mark T. Simerly, Col. Marchant Callis, and Maj. Ryan J. Legault titled "Transforming Army Sustainment to Contend with a Contested Logistics Environment," the authors emphasized the importance of future sustainment forces and their preparedness to effectively operate in this setting across the land, maritime, air, cyber, and space domains to provide our combat forces with the ability to prevail against a peer threat.[15] The heightened threat landscape in LSCO necessitates the integration of robust cybersecurity measures within SASMO's framework, and SASMO is evolving to implement advanced algorithms for resource allocation to meet the unprecedented demands of large-scale cyber campaigns. Security protocols and risk management become integral components, ensuring

Soldiers from 3rd Special Forces Group (Airborne) conduct training with soldiers from HHB, 3rd Battalion, 6th Field Artillery Regiment, 1st Brigade Combat Team, 10th Mountain Division, 18 May 2023 on Fort Drum, New York. Included in the training was close-quarter battle operations with demonstrations of infantry-style reconnaissance in a simulated combat scenario, and instruction and practical exercises of how to tactically maneuver in a close-quarter environment. The training allowed for a unique opportunity for 10th Mountain soldiers to train with Special Forces. (Photo by Staff Sgt. Elizabeth L. Rundell, U.S. Army)

the protection of critical cyber assets and minimizing vulnerabilities in the sustainment process.

SASMO plays a pivotal role in the logistics and supply chain management of cyber resources. In LSCO, where rapid deployment and flexibility are paramount, SASMO is evolving to embrace agile methodologies. This involves streamlined processes, real-time tracking, and on-demand provisioning of resources to meet the dynamic requirements of operations. The Army needs to look toward cloud computing; lighter, more mobile systems; and newer satellite terminals that have access to higher bandwidths. This will enable access to data and parts and provide the ability to perform supply actions in real time with minimal delay or lag time.

As an example, munition processes require up to three separate logistic information systems for a single ammunition issue (the Munitions History Program, the Total Army Munitions Information System, and the Standard Army Ammunition System). All three systems operate unconnected from each other and exclusively from their own central servers located in various locations throughout the United States. Current tactical-level accountable officers must connect through a Combat Service Support Very Small Aperture Terminal to gain a connection to the three systems to provide accurate and safe munitions to the warfighter. From the depot level through to the corps support area, this does not present an issue; however, in LSCO, from the DSA forward and into the alpine region, eliminating the use of a Combat Service Support Very Small Aperture Terminal and equipment through the challenging surroundings will be needed. Modernization that keeps accountability but reduces the footprint and can work disconnected until being able to upload data into a server is a necessity. The ability to work disconnected with a small, tactical mobile device that can timestamp and initiate resupply, capture expenditures, and do the singular job of the current three systems in support

Soldiers from the 10th Mountain Division Sustainment Brigade pull a recovered bundle from a Fort Drum training area after it was dropped from a CH-47 Chinook helicopter 2 February 2024. The training was conducted to improve overall understanding of aerial delivery distribution in large-scale combat operation, alpine, and austere environments. (Photo by Sgt. Alexander Kelsall, U.S. Army)

of munitions management will be vital to mission success at the tactical level.

Munitions

Ammunition support during GWOT was a depot-to-tactical approach. Depots would amass munitions at ports of entry and disperse around 200 percent of the unit's combat load down to a DSA. The DSA was responsible for pushing ammunition to the BSAs, which strived to have a 100 percent combat load plus operational and training munitions on hand for the units supported within its BSA lines of communication (LOC). This was sustainable under the conditions in which support elements maintained static positions throughout their deployments.

In a near-peer environment, the DSA and BSA will be required to relocate in conjunction with the forward line of troops. Requiring a BSB to handle one complete combat load for a light infantry brigade would overburden the transportation assets and require the unit to leave noncritical ammunitions, supplies, and equipment behind. Transportation challenges will be further exacerbated in Stryker and armor units in which the number of transportation platforms needed for munitions would significantly increase due to the type of munitions distributed.

Key munition factors to consider when conducting logistical operations in an alpine environment are concealment, means of ascending, altitude, weather, and modes of transportation. GWOT was conducted in the Middle East, where LOCs went mostly from one sea-level outpost to the next. And even in Afghanistan's mountainous environment, Army equipment typically conducted combat logistical patrols in heavy vehicles from the supply point to the warfighter. In alpine terrain, we lose the capability to line-haul 66,000 lb. Palletized Load Systems on trailers over greater distances and will need to shorten the LOCs and quantity of munitions.[16] Instead of providing combat loads to battalions, companies, or platoons, the environment and near-peer threat will require squad-sized resupplies broken down from bulk packaging to more manageable loads.

10th Combat Aviation Brigade and 3rd Battalion, 6th Field Artillery Regiment, soldiers conduct a howitzer gun raid on Fort Drum, New York, 6 November 2023. This exercise was conducted to strengthen mountain warfare capabilities. (Photo by Spc. Samuel Bonney, U.S. Army)

The TRV-150 autonomous lift platform being implemented into training and consideration can carry a max load of 150 lb. due to potential autonomous lift capabilities. A crate of 1,680 5.56 mm rounds weighs 66 lb.—16 lb. of that weight is packaging material in wood, metal, and cardboard. By breaking down the packaging and sending the munitions in bandoleer configuration, we can support 5,040 rounds in one shipment.[17] That's enough 5.56 mm to resupply 2.6 infantry squads compared to 2.2 in bulk packaging.

When considering grenadier and squad automatic weapon calibers and munitions, an entire squad can be resupplied by eliminating bulk package compared to two separate shipments or ascensions up a mountain. However, when eliminating the packaging of munitions, you run the risk of its degradation and rendering your ammunition unserviceable. Commanders will have to generate support requirements that assume some risk to be light, tactical, and lethal. Looking at repackaging munitions into kit flyer bags down to the magazine, certifying infantry leaders on quality assurance and quality control measures, and training on class V preservation to include internal maintenance in austere environments are all measures being taken to overcome that risk.

Conclusion

To these ends, the 10th Mountain Division Sustainment Brigade aims to innovate and transform from the GWOT structure and mentality while learning from its experiences and pivoting toward providing superior sustainment support to the division in all environments to meet the demands of our Nation's interests with particular emphasis on preparing for the alpine fight. Our preparation and mastery will maximize the division's lethality by delivering increased freedom of action, improving operational reach, and prolonging endurance to continue supporting the climb. ■

Notes

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