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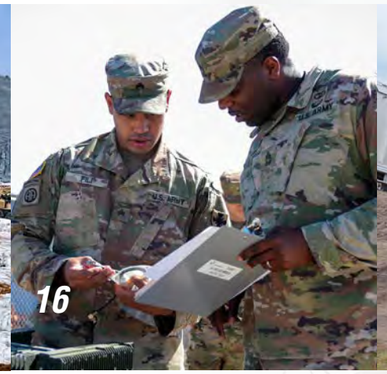
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"As the Army transitions to a multi-domain operations-capable force, we must modernize and transform the sustainment warfighting function capabilities now to respond and enable tactical and operational commanders to expand freedom of action, extend operational reach, and ensure prolonged endurance."

Gen. Ed Daly

Soldiers from the 2nd General Support Battalion, 3rd Aviation Regiment, 3rd Combat Aviation Brigade, 3rd Infantry Division, and 129th Combat Sustainment Support Battalion, 101st Division Sustainment Brigade, 101st Airborne Division (Air Assault), conduct sling load operations May 10 during Guardian Response 22, a homeland emergency response exercise, at Camp Atterbury, Indiana. (Photo by Sgt. Savannah Roy)

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ON THE COVER

The theme for the Summer 2022 *Army Sustainment* issue is Force Modernization. This collage of photos shows some of the modernization efforts within the Army Sustainment community. (Photo collage by Sarah Lancia)

This medium is approved for the official dissemination of material designed to keep individuals within the Army knowledgeable of current and emerging developments within their areas of expertise for the purpose of enhancing their professional development.

By Order of the Secretary of the Army:

JAMES C. MCCONVILLE
General, United States Army
Chief of Staff

Official:

MARK F. AVERILL
Administrative Assistant
to the Secretary of the Army
2224215

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Submissions Wanted

Army Sustainment is seeking articles on techniques, tactics, and procedures; emerging trends; lessons learned; and other experiences.

The editorial staff from *Army Sustainment* is seeking submissions from the community. As with all content submitted to *Army Sustainment*, it should be sustainment focused, provide professional development information, and should not contain any classified or sensitive information.

Submissions should be well-developed narrative articles and can be opinions, techniques, tactics, and procedures, lessons learned, exploration of new technologies or emerging trends, or other similar content of a valuable nature to fellow sustainers.

General public affairs style coverage or content on units, exercises, initiatives and events that do not otherwise hold additional professional development value are typically not as strong as those submissions that offer real, actionable sustainment information.

While the editorial staff here at *Army Sustainment* do conduct our own review and editorial process and have authority to approve content submitted to us for public release, we recommend at least some basic professional coordination between the submitting author and their organization's public affairs or public information office, especially for U.S. personnel working in NATO or other multinational organizations.

Army Sustainment chooses new topics for each bulletin and accepts contributions from the sustainment field. Check out our social media, including our page on Facebook, to learn about upcoming topics.

Find more information: *www.alu.army.mil/alog/submissions.html*

SHAPING the SUSTAINMENT FORCE for the FUTURE

■ *By Gen. Ed Daly*

The Army is currently in the midst of its biggest transformation in more than 40 years as we rapidly develop, acquire, and field new equipment and leap-ahead technologies, along with the skillsets, people, and force structure necessary to fight and win on the future battlefield. While weapons systems and equipment may change over time, the one constant is the need to supply, maintain, and sustain those systems from the strategic support area (SSA) to the tactical edge.

The conflict in Ukraine has clearly demonstrated the need for maneuver forces to have effective and robust sustainment support to be successful on the modern battlefield, enabled by contested logistics and mindful of the criticalities of internal and external lines of communication. As the Army shifts its focus from counterinsurgency operations to strategic competition, integrated deterrence, and large-scale combat operations (LSCO) per the National Defense Strategy, logisticians will continue to have a critical role in the future contested environment. Army senior leaders recognize this. Chief of Staff of the Army Gen. James McConville recently said, "While innovation and modernization are certainly going to change the way we do logistics on the battlefield, it's not going to change the criticality of sustaining our units while they're in combat—I want to make sure our logisticians understand just how important they are on the battlefield."

As the Army transitions to a multi-domain operations (MDO)-capable force, we must modernize and transform the sustainment warfighting function capabilities now to respond and enable tactical and operational commanders to expand freedom of action, extend operational reach, and ensure prolonged endurance. Said differently, sustainment capacity must anticipate requirements to build and sustain tactical combat power forward in the battlespace.

Shaping the sustainment force for 2030 and beyond starts with ensuring we are aligned and synchronized with the Army Modernization Strategy and the MDO concept. Logisticians are collaborating with our partners at the Assistant Secretary of the Army for Acquisition, Logistics and Technology and their program executive offices; Army Futures Command and their cross-functional teams; U.S. Army Training and Doctrine Command centers of excellence; and academia and industry to develop and implement the tactical modernization requirements to support the Army's signature modernization efforts. Additionally, the Army's Force Sustainment Modernization Strategy outlines several targeted modernization priorities that shape the Army Campaign Plan 23-30, ensuring the sustainment warfighting function is synchronized with the Total Army's efforts to implement the Army Strategy.

Shaping the future force goes beyond materiel modernization, or what we fight with—it also encompasses the doctrine, organization, training, materiel, leadership and education, personnel, and facilities framework. Just as new technology, systems, and equipment necessitate new doctrine and maneuver force structures, so too does it necessitate new training, facilities, methods, and the associated people with the right skillsets and force structure to supply, maintain, and sustain those systems and units. With the division becoming the eminent tactical unit of employment under MDO, we must modernize the sustainment force structure in lockstep with the maneuver force structure changes.

The way we have conducted sustainment in the past will not be sufficient for future operations in a complex environment and extended battlespace that is contested across all domains. The way we have conducted sustainment operations with large storage and distribution areas moving predictably along prescribed routes and distribution points will be challenged in the future. We will no longer have complete unchallenged lines of communication from our depots, arsenals, ammunition plants, and installations through ports of embarkation and debarkation to the tactical edge; we must modernize both our systems and processes to protect our deployed units and materiel in a contested environment.

Critical to setting the theater for LSCO in MDO is having echeloned sustainment for distributed operations from the SSA to the tactical edge, which requires focusing on mobility, fuel, materiel management, and the importance of organic maintenance capabilities forward in the battlespace. Sustainment brigades are division-aligned to mission command sustainment units to provide distributed commodity management. Expeditionary sustainment commands (ESC) are corps-aligned, and theater sustainment commands (TSC) are Army service component command-aligned; TSCs and ESCs are the centers of gravity for operational and tactical sustainment. The TSC receives units and equipment from the SSA is critical to set the theater, while the ESC is the functional headquarters to manage the throughput, distribution, oversight, commodity management, and sustainment planning for a corps commander.

We cannot allow the Army to modernize without transforming the sustainment warfighting function capabilities for the future. The sustainment enterprise must be proactive in maximizing sustainment capabilities for LSCO in MDO at the TSC, ESC, and division levels. One aspect that makes our Army the finest in the world is our ability to project and sustain combat power worldwide across all domains. Now more than ever, we must look at how we are structured currently and for the next 20 years to meet the challenges of the strategic environment and battlespace and provide speed, range, and convergence to achieve dominance and overmatch. We must ensure the 21st century Army is supported by an equally capable and modernized 21st-century sustainment enterprise.

Gen. Ed Daly serves as the commanding general of the U.S. Army Materiel Command. He served three years as the deputy commanding general of AMC in his previous assignment. He managed the day-to-day operations of the Army's logistics enterprise and served as the senior commander of Redstone Arsenal, Alabama. He served as the commanding general of Army Sustainment Command at Rock Island Arsenal, Illinois, and as AMC's deputy chief of staff, overseeing the roles and functions of the headquarters staff.

We cannot allow the Army to modernize without transforming the sustainment warfighting function capabilities for the future. The sustainment enterprise must be proactive in maximizing sustainment capabilities for LSCO in MDO at the TSC, ESC, and division levels.

Maintaining Force Sustainment Modernization Momentum Across the Enterprise

■ *By Lt. Gen. R. Scott Dingle and Lt. Gen. Charles R. Hamilton*

As the Army pursues its greatest transformational change in nearly four decades to prepare for large-scale combat operations (LSCO) across multiple domains, its sustainers and logisticians will continue to serve as its most critical enabling force. The Army's collective readiness—across the strategic and tactical space—is the product of a sound Army sustainment enterprise (ASE) that is in the process of holistically modernizing for the future fight. From munitions distribution to medical logistics, each and every component of sustainment will be foundational to advancing Army senior leader priorities and objectives as outlined in the Army Modernization Strategy.

To garner more in-depth insight into how the ASE is posturing its force for the evolving and complex dynamics of the future fight, *Army Sustainment* sat down with Lt. Gen R. Scott Dingle, Surgeon General of the Army and commanding general of Army Medical Command (MEDCOM), and Lt. Gen. Charles R. Hamilton, the Deputy Chief of Staff, G-4, to discuss their perspective on driving modernization across the force while bolstering readiness at echelon.

The Army's ability to set the theater has long been a key strategic advantage as a deterring force and foundation for rapid action. Moving forward, how will changing conditions across echelons affect this ability and its anticipated effects? Moreover, how is the ASE operationalizing the way it modernizes to drive readiness now and for the future?

Hamilton: Setting the theater is a complex and continuous process throughout competition, crisis, and conflict. We've proven extremely proficient at executing all of its supporting activities in the past as a recent example from this spring, it took an entire armored brigade less than one week to deploy from Georgia to Germany and draw materiel from Army prepositioned stock (APS) for training. This ability shouldn't come as a surprise, however—we spent years setting the European theater prior to that deployment, so our quick response was expected. Looking toward the future, we will need to be more flexible in how we assume operations will play out in both the strategic and tactical space. We're assuming a potentially contested homeland, so that will guide how we modernize our organic industrial base to surge for LSCO with efficiency and resiliency. Modernizing our APS sets in preparation for dispersed and contested operations around the globe is another key effort. Precisely forward positioning the right materiel and supplies ensures our enhanced ability to set the theater for LSCO. Overall, though, operationalizing sustainment modernization is an ASE-wide effort. We have a massive leg up from our last large-scale modernization effort some four decades ago, as we've integrated with the Assistant Secretary of the Army for Acquisition, Logistics, and Technology and Army Futures Command to ensure that each new materiel capability developed and delivered is done so with sustainment firmly in mind.

Army medical logistics specialists Spc. Josue Martinez Carmona from Fort Hood, Texas, and Sgt. Armando Alverio Lebron from Joint Base Lewis–McChord, Washington, check class 8 medical materiel in preparation for DEFENDER-Europe 22 exercise operations April 5 at Dülmen Tower Barracks, Germany. (Photo by Libby Weiler)

How is MEDCOM—as a key member of the ASE—ensuring the Army's ability to sustain medical logistics (MEDLOG) needs across theaters and drive readiness now and for the future?

Dingle: The Office of the Surgeon General (OTSG) and MEDCOM are part of the Army's phase 0 MEDLOG sustainment concept governance process, as led by the Army Medical Logistics Command in support of Army Materiel Command—the lead Army command for this endeavor. These forums are planning to achieve integration of CL VIII supplies and MEDLOG within the ASE to support LSCO through three proposed lines of effort: maintenance; information technology (IT) and materiel management; and distribution. Additionally, the overall effort is divided into multiple doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF-P) working groups to facilitate a multidisciplinary approach in developing an overall concept of operation. As an example, to support Army medical maintenance, working groups are analyzing aspects of organization, personnel, facilities, and systems to develop an enduring model to support and sustain medical equipment, ensuring combat medics and clinicians have the tools needed to perform their duties in LSCO while enabling total Army readiness. Another key forum focus is ensuring that the general officer steering committee is building toward an Army-level decision on which national-level IT system the Army

will use to support MEDLOG. Our mission at OTSG/MEDCOM is to provide the best medical advice to ensure mission success in the complex and contested future environments we anticipate facing.

Sustainment modernization extends far beyond simply buying new or updating existing materiel capabilities. How is the ASE approaching modernization from a policy perspective that effectively resources new capabilities to a development perspective that ensures the entire force is appropriately trained to execute the sustainment warfighting function in support of multi-domain operations (MDO) within and across multiple theaters?

Dingle: Developing and implementing policy that keeps pace with modernization is central to those phase 0 forums I mentioned earlier. Integrating Army supply support activities into the MEDLOG sustainment concept will require us to update existing policy or create new policy to guide that integration. Of course, effective policy needs to be nested with the other DOTMLPF-P domains to proactively resolve any MEDLOG-specific readiness gaps when we're discussing setting theaters for MDO. From a policy perspective, we're focused on reviewing current Army regulations, which outline key roles and responsibilities required to plan and execute MEDLOG now and with a future focus. To execute this at scale, we work in tandem with Army Medical Logistics Command and other key stakeholders to identify policy gaps that may hinder those modernization efforts. This also requires that we identify dependency topics that are addressed across the DOTMLPF-P space that have that direct link to policy, such as master data management or supply support activity stockage capabilities. This activity ensures our policies are aligned to support all MEDLOG modernization planning and execution.

Hamilton: Both our doctrine and policy need to be reflective of our modernization efforts and their collective end-state. Our initiatives related to Enterprise Business Systems—Convergence (EBS-C) provide a great example of how we're modernizing to enhance our ability to execute sustainment and enable the warfighter in MDO. By integrating five legacy EBS into a single transactional system, the Army can seamlessly share information between both systems and commands, increasing decision space for commanders. The EBS Multi-Functional Capabilities Team (EBS-MFCT) is driving the effort writ large with critical support within and beyond the ASE across all of the Army's business mission area domains. Among other things, our role in the G-4 is to provide functional, domain-specific expertise throughout development while serving as a key enabler of business process reengineering efforts to align project scope to desired outputs as we approach full operational capability. From the start of this process, the EBS-MFCT has been a fantastic partner, ensuring that financial, logistics, acquisition, and human resources inputs from Soldiers and civilians are sourced to align requirements with current and future capability needs. The goal is to deliver a unified system that will offer commanders rapid and reliable insight from day 0, and all of this synchronization is working to make that a reality for the Army of 2030 and beyond.

Lt. Gen. R. Scott Dingle currently serves as the Army Surgeon General and commanding general of U.S. Army Medical Command. Prior to that position, he served as the deputy surgeon general and deputy commanding general (support) at MEDCOM. He earned his bachelor's degree as a distinguished military graduate from Morgan State University, a Master of Science in Administration from Central Michigan University, a Master of Military Arts and Science from the School of Advanced Military Studies, and a Master of Science in National Security Strategy from the National War College. His military education includes the Army Medical Department Officer Basic Course, the Combined Logistics Officer Advanced Course, and time spent at the U.S. Army Command and General Staff College, the School of Advanced Military Studies, and the National War College.

Lt. Gen. Charles R. Hamilton currently serves as the Deputy Chief of Staff, G-4. He most recently served as the assistant deputy chief of staff for operations, G-4 3/5/7. Hailing from Houston, Texas, Hamilton enlisted in the U.S. Army. Upon completion of basic and individual training, he was assigned to Fort Hood, Texas. In February 1988, he graduated from Officer Candidate School as a distinguished military graduate and was commissioned as a second lieutenant in the Quartermaster Corps. He earned a Bachelor of Science in Business Administration from Virginia State University and Masters' Degrees in Public Administration from Central Michigan University, and Military Studies from Marine Corps University. He also is a graduate of a Senior Service College Fellowship – Secretary of Defense Corporate Fellows Program.

CONFRONTING

the Changing Sustainment Battlefield Calculus

■ *By Maj. Gen. Mark T. Simerly*

As the Army undergoes its largest transformation in the last four decades, it must invest wisely in its ability to fix, fuel, move, arm, and sustain its modernized forces. The designs of Army 2030 require the holistic modernization of sustainment capabilities in order to sustain large-scale combat operations (LSCO) against peer competitors.

Meeting the demands of Multi-Domain Operations with Army 2030 Force Structure

Army 2030 represents a fundamental shift to the division as the tactical unit of action. It is now the division, not the brigade combat team (BCT), where decisive maneuver is planned and executed. To enable decisive maneuver during multi-domain operations (MDO), which includes the domains of land, air, maritime, space, and cyberspace, Army 2030 reorganizes divisions into five purpose-built designs. Anticipated division designs are heavy reinforced, airborne, air assault, heavy, and light. Additionally, these divisions will be coupled with emerging and modernized capabilities. These capabilities take the form of units and consist of division artillery, division cavalry, protection brigade, mobile protection firepower battalion, intelligence and electronic warfare battalion, and the division sustainment brigade (DSB).

In all, Army 2030 force structure is the combination of the five division designs coupled with emerging formations to leverage modernized capabilities. As a multi-domain capable force, Army 2030 wields fire, maneuver, and shock effect to see, seize, and exploit positions of advantage across all domains.

For tactical sustainment leaders, Army 2030 presents new sustainment force structure. Designs for the brigade support battalion, light support battalion, and the DSB reorganize the Army's sustainment capabilities based on division type. Each design will have varied capabilities based on the supported division, such as the light support battalion will support motorized brigades within airborne and air assault divisions. The DSB, in particular, has been adapted to support each of the five different division designs, tailored to provide unique capabilities. Based on the DSB design, these increased capabilities can include a modular ammunition company, medium truck

Harnessing data as the decisive commodity will enable sustainers to leverage analytical tools, machine learning, and small-scale simulations to explore feasible sustainment solutions.

company (palletized load system), medium truck company (petroleum, oil, lubricants, and 5K trucks), mortuary affairs platoon, and an inland cargo transfer company.

Enabling the DSB headquarters to synchronize and integrate the sustainment warfighting function at the division, headquarters staff sections are modified, and new sections are created, such as the support operation materiel management CL VIII section. With mission-oriented sustainment capabilities, assets, and activities, the DSB is the nucleus of division sustainment operations. However, new force structure alone will not solve challenges associated with sustainment synchronization and integration during MDO.

Sustainers preparing for the future fight

Between now and 2030, sustainers must adapt their understanding of sustainment activities from brigade centric to division-centric operations. This fundamental shift to the division as the tactical unit of action creates new complexities for sustainers in a multi-domain environment. Lethal and non-lethal effects by the enemy will degrade, disrupt, and destroy sustainment mission command, assets, and activities. To mitigate this, sustainers must think in terms of mobility, disbursement, and survivability when developing a concept of sustainment. While employing techniques to reduce adverse enemy action, sustainers will face greater challenges to support decisive maneuver.

Additionally, sustainers must anticipate enemy actions against sustainment activities and nodes on the battlefield. Anticipating enemy actions requires sustainers to learn and understand how an adversary will employ their forces. As an example, Army Techniques Publication 7-100.3, *Chinese Tactics*, provides a holistic overview of the structure, tactics, and operational employment concepts of the People's Liberation army. Sustainers can use an adversary's doctrine to balance force protection efforts against enemy actions while executing sustainment activities. However, this balance is an enduring challenge, which sustainers must continue to navigate to an even greater degree on a LSCO battlefield. Aiding sustainers to navigate the complexity of an MDO environment is data.

The most decisive commodity sustainers will manage on the battlefield is data. However, the pace of Army modernization and anticipated requirements of MDO will outpace sustainers' ability to effectively analyze data. To close this gap, the sustainment warfighting function must invest in data education and literacy through professional military education (PME) and independent study. PME programs focused on foundational level understanding through master sustaining data courses will enhance officer, non-commissioned officers, and Army civilian career progression and professional development to close the data gap. Harnessing data as the decisive commodity will enable sustainers to leverage analytical tools, machine learning, and small-scale simulations to explore feasible sustainment solutions. Adversely, sustainers can employ data for deception operations by sending the wrong logistical demand signals for enemy intercept. As the most decisive commodity, sustainers must embrace a culture of data-driven decision-making, which is practiced through holistic training.

Sustainers must train on mission command, planning, and data management. Command post operations, through the execution of battle drills, standard operating procedures, situational understanding, and battle rhythm, informs the proficiency of a sustainment command post. An effective command post drives synchronization and integration of the sustainment warfighting function at echelon through effective data management. A command post's ability to conduct knowledge management, maintain situational understanding, control and assess operations, and coordinate with internal and external organizations will be degraded during MDO. Command post training must account for enemy action, how and when data will transmitted, and overall survivability and mobility of the command post to ensure the commander is armed to make data-informed decisions.

While understanding division-centric operations with new force structure, sustainers must also train to the lethality and high demands of LSCO. Training to the scope of LSCO is a daunting task. However, training readiness starts with the Soldier, builds into certified crews and teams, and is validated through platoon and company mission essential tasks. Training is a continuous effort and is incumbent on sustainers to maximize every opportunity, from incorporating garrison support tasks to collective training events. By doing routine things routinely well, the challenges of a LSCO fight are lessoned. Through a holistic training strategy, sustainers integrate their training progression with the training plans of lateral and higher formations. By integrating sustainment training objectives with lateral, higher, and emerging formations (i.e., division artillery and division cavalry), training itself will begin to take on the scale and scope of LSCO.

Lastly, a division-centric fight does not afford the same luxuries of a BCT fight, where personnel and materiel are cross-leveled within a division to improve one BCT's overall readiness. Tactical sustainers must look hard at both their own formations and divisional formations which they support. Personnel and materiel deficiencies across the division's sustainment community will become more apparent and must be clearly articulated in terms of risk. Conveying sustainment risk is in terms of freedom of maneuver, operational reach, and prolonged endurance for a division. Most importantly, sustainers will need to generate and implement tactical solutions to mitigate the associated risk with materiel and personnel deficiencies. With the shift to division-centric operations and emerging force structure, sustainers must maximize training, materiel, and personnel readiness to meet the lethality and high demand of LSCO.

The shift to division-centric operations is not revolutionary and does not change sustainment principles and concepts. That being said, division-centric operations within a multi-domain environment does create new problem sets for sustainers. To combat these problem sets, emerging force structure such as the DSB, provide sustainers the organizational tools to maintain tempo, velocity, and volume to sustain decisive maneuver. Sustainers need to understand the force structure, so they can leverage training strategies that complement the ultimate goal of enabling freedom of maneuver on the LSCO/MDO battlefield. Army 2030 is a fundamental shift, one which sustainers must be ready for.

Maj. Gen. Mark T. Simerly serves as the commanding general of the Combined Arms Support Command at Fort Lee, Virginia. He previously served as the commander of the 19th Expeditionary Support Command. He was commissioned as a lieutenant of Air Defense Artillery and awarded a Bachelor of Arts Degree as a Distinguished Military Graduate from the University of Richmond. He holds a Master of Science in National Resource Strategy from the National Defense University and a Master of Military Arts and Sciences Degree from the Army Command and General Staff College.

Sustainment Survivability in Large-Scale Combat Operations

Lessons Learned in the Brigade Support Area Defense

■ *By Maj. Matthew N. Mayor, Capt. Charles R. Bransom, and Capt. Karlos E. Febustraphagen*

Establishing a survivable brigade support area (BSA) defense during large-scale combat operations (LSCO) is critical for the brigade support battalion (BSB) as it enables direct support logistics, field maintenance, and echeloned force health protection support to the armored brigade combat team (ABCT). The combat power and operational reach of the ABCT are dependent on the BSA's survivability while enabling sustainment responsiveness and continuity, as the 101st BSB experienced at Combined Resolve XVI. Combined Resolve XVI is a decisive action training exercise held at the Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany, where units must simultaneously execute offensive, defensive, and stability operations against a near-peer and hybrid threat. The exercise focuses on the ability of units to execute unified land operations with NATO allies and coalition partners. The 101st BSB deployed to Hohenfels training area (HTA) via rail and commercial line haul to join more than 4,600 troops from Bulgaria, Georgia, Greece, Italy, Lithuania, Poland, Serbia, Slovenia, Ukraine, United Kingdom, and the United States at Combined Resolve XVI, which strengthened interoperability and multinational cooperation in a combined decisive action operational environment. The 101st BSB organically deployed and redeployed more than 330 Soldiers and 400 pieces of equipment from its Operation Atlantic Resolve forward operating site in Poland to Combined Resolve XVI from Nov. 17, 2021, to Dec. 20, 2021.

Upon arrival to HTA, the BSB supported the 1st ABCT, 1st Infantry Division build-up of combat power in the area of operations (AO). The BSB's closed phase training module included a BSA defense module consisting of level one attacks on the BSA by irregular forces and active surveillance by civilians. The 101st BSB's training objectives during Combined Resolve XVI were to conduct base defense, provide uninterrupted sustainment to the brigade, and ensure all Soldiers made incremental improvements to master fundamentals in assigned positions. These training objectives were exercised during the transition to open phase training as the BSB conducted a tactical displacement to ensure survivability and increase responsiveness to the brigade's support requirements. The BSB conducted distribution operations to deliver critical commodities to supported units. While conducting daily logistics synchronization meetings with supported battalions, the BSB provided continuous medical and logistic support as the battalions transitioned through their respective training modules. The BSB provided sustainment support to the 1st ABCT and multinational units attached to the task force. The brigade's task organization consisted of one U.S. maneuver battalion, one Slovakian mechanized battalion, one cavalry squadron, one Italian tank platoon, one Bulgarian mechanized company, one Greek reconnaissance platoon, one U.S. engineer battalion, one U.S. field artillery battalion, one U.S. brigade support battalion, and one U.S. combat aviation squadron. The 721st Combat Sustainment Support Battalion provided division-level sustainment support.

Army Techniques Publication (ATP) 4-90, *Brigade Support Battalion*, identifies LSCO and BSA survivability as top challenges to the ABCT to sustain itself via the BSB as the operational tempo and lethality, which create significantly higher supply consumption and maintenance requirements, place extreme demands on sustainment organizations. The BCT will move rapidly over extended distances, especially during offensive operations. The BSA will displace frequently and must keep pace with the BCT while simultaneously executing required sustainment support. Further, ATP 4-90 highlights the importance of BSA survivability during LSCO as there is no sanctuary area within the BCT or division area of operations. The enemy can target the BSA and sustainment units throughout the depth of the AO with direct and indirect fires to cause BCTs to culminate. BSBs should assume that they are under observation and plan to displace, disperse, and react to all eight forms of contact during operations. 1st ABCT's 1st ID's successful execution of the Combined Resolve XVI force-on-force portion at JMRC from Dec. 3-15, 2021, highlighted several BSA survivability challenges and lessons learned as the brigade trained to validate its ability to conduct multinational operations in a multi-domain battlespace.

BSA Site Selection Lessons Learned

Overall, the 101st BSB leveraged its validated tactical standard operating procedure (TACSOP) and the military decision-making process (MDMP) to select suitable BSA locations during Combined Resolve XVI with several lessons learned. First, the 101st BSB sought to choose a BSA site that provided prolonged endurance, which is the ability to organize, protect, and sustain the 1st ABCT regardless of the distance from its base and environmental austerity while ensuring operational reach and freedom of action. Operational reach describes the distance and duration across which the 1st ABCT can successfully employ military capabilities. Freedom of action describes the ability to achieve initiative, maintain tempo by

planning, and execute sustainment to support a maximum number of courses of action (COAs) for the supported commander.

The 101st BSB displaced to two sites (BSA 1 and 2) within HTA with selection criteria based on MDMP and the battalion's TACSOP. The sites were each established by priorities of work and capabilities force flow package. The selection criteria are critical to the success of establishing an effective BSA. For example, during MDMP, the BSB prioritized survivability based on the assessment that the BSB could not support the brigade in a critically degraded state. Initially, BSA 1 seemed to be an ideal location and fit within the BSB's primary selection criteria that provided survivability and enabled support. However, adverse weather and terrain degradation became a major problem immediately after establishment, which limited the BSB's ability to support the ABCT and sustain critical supply commodities at the BSA. BSA 1 was well defended against a direct attack, but the site lacked overhead concealment. The BSB mitigated this shortfall by leveraging aerial surveillance and attack assets while distributing critical mobile and static defensive positions along the tree line while using distance to protect command nodes.

The selection process for BSA 2 leveraged the lessons learned at BSA 1 as the selection criteria shifted to responsiveness to build redundancy of supply commodities within 1st ABCT while focusing on supportability and maintaining echelons above brigade supply lines to the BSA. BSA 2 was selected on the premise of drive-through logistics, which allows a constant flow of customers to receive commodities quickly and efficiently. However, the disadvantages of BSA 2 included the ability to secure it without attached assets from across the ABCT, while the mountainous topography limited tactical frequency modulation communications with adjacent units. BSA 2 was set in a valley against a hillside, which provided some protection against indirect fires, but it was highly vulnerable to direct and aerial attacks. Furthermore, it was an easily observed location by any enemy forces on the adjacent high ground. Although the attack risk was significantly higher, the reward of fast and effective sustainment to the supported battalions was paramount during this portion of the rotation in HTA. The weather conditions and impacts on route trafficability continued to be a tough adversary in both locations and should be factored into COA development and weighted heavily as COA selection criteria.

BSA Survivability Lessons Learned

The 101st BSB learned that listening and observation posts, close air support (CAS), and fire support are critical planning considerations early in the MDMP process. According to ATP 4-90, the BSB S-2 plans the reconnaissance and surveillance portion to facilitate the BSA's survivability. This requires coordination and unanimity from the BSB command sergeant major, S-3, and companies to trust that the plan created is the one that will enable BSA survivability while understanding that it is subject to operational adaptations. Further, building more robust external and internal relationships while garnering credibility through intensive training repetition before the deployment into the training area would have alleviated BSA survivability ownership friction points at each site. The BSB learned that defensive positions in the BSA must be complemented with regular roving patrols and tactical unmanned aircraft systems to expand observational reach and deterrence. The BSB excelled at establishing fighting positions and emplacing obstacles, but layered defensive position refinement slowed as time passed with impacts from the weather, terrain, and operational exhaustion.

BSA defense ownership ambiguity within the organization slowed continuous defense refinement coupled with the fog and friction of the operational realities during the rotation. For example, the BSB struggled to consolidate updated sector sketch cards with the BSB S-3 for a holistic defensive analysis while establishing clear ownership of the quick reaction force were lessons learned. Each company had a different standard for security posture while minimal engagement area development occurred, leading to security gaps. Furthermore, the Charlie Medical Company was on the perimeter at both BSA sites, closest to a main supply route and within hand grenade range from the tree line, which was not ideal. The 101st BSB remained challenged to coordinate and synchronize the defense of the BSA at both sites during the exercise. A lack of understanding and the slowed execution of basic Soldier tasks across the battalion prevented the organization from reaching a fully cohesive defensive plan. Finally, the BSA defense lacked pre-planned fires targets given to the BSB from its higher headquarters. Incorporating final protective fires targets and two-three predesignated targets in support of the BSA defense before operational execution would assist the BSB in layering effects for any decisive threat, bypassing the forward line of troops.

BSA Defense

The BSB must continue to incorporate and practice Mission Essential Task (MET) 63-BN-4885, *Conduct Actions Associated with Area Defense*, to better understand the supporting and individual tasks. The BSB must supplement Army Doctrine Publication 3-90, *Offense and Defense*, with ATP 3-21, chapter 3, section V, for engagement area development while ensuring all Soldiers understand how to use their capabilities, such as AN/PAS-13 thermals, night vision devices, and tripods. Executing a base defense squad tactical exercise or live fire to test progression on this MET would pay dividends. Full utilization of a base defense operations cell (BDOC) in union with the TACSOP will provide a defense common operational picture to the BSA.

Establishing Pre-Planned Protective Fires

The BSB did not utilize pre-planned fires in defense planning or execution of the BSA protection during Combined Resolve XVI. BSBs must have planned fires points coordinated on avenues of approach, potential enemy observation points, and final protective fires in the event of a perimeter breach. The BSB learned that training on call for fire and planned fires point planning should be conducted and integrated into BDOC operations. The battalion TACSOP must outline pre-planned fires planning and CAS.

Intelligence Integration and Dissemination

The BSB learned the importance of intelligence integration into the trip ticket process, which would allow the BSB S-2 to have a platform to relay ground-level intelligence to convoy leadership. This intelligence was often not integrated into convoy briefs and disseminated to the lowest level by convoy commanders. The BSB S-2 analyst must be present and brief during all convoy briefs leaving the immediate battlespace. At the same time, the BSB S-3 must enforce a standard of updated intelligence briefs within two hours of planned convoy movement times.

Tactical Convoy Operations

Convoy commanders and sub-ordinates in the BSB often struggled with all the supporting and individual tasks associated with convoy operations during Combines Resolve XVI. The BSB learned the importance of incorporating MET task 63-BN-4033, *Coordinate Distribution Support*, in future training events through the BSB's training glide path. All movement operations must be a training opportunity to allow young leaders to get multi-purpose training. Companies must focus on ten-level tasks such as convoy briefs, rehearsals, and convoy movements to build confidence and proficiency in their abilities.

Maj. Matthew N. Mayor currently serves as the battalion executive officer for the 101st Brigade Support Battalion, 1st Armored Brigade Combat Team, 1st Infantry Division, at Fort Riley, Kansas. He holds two bachelor's degrees in criminology and philosophy from Marquette University in Wisconsin. He also holds a Master of Business Administration from the College of William and Mary in Virginia, a master's degree in Public Policy and Administration from Northwestern University in Illinois, a master's degree in Operational Studies from the Command and General Staff College (CGSC), and a master's degree in Management and Leadership from Webster University in Missouri.

Capt. Charles R. Bransom currently serves as the battalion operations officer for the 101st Brigade Support Battalion, 1st Armored Brigade Combat Team, 1st Infantry Division, at Fort Riley, Kansas. He holds a bachelor's degree in Agricultural Engineering and Industrial Technologies from Sam Houston State University in Texas.

Capt. Karlos Febustraphagen is a U.S. Army Military Intelligence officer currently serving as the battalion S-2 for the 101st Brigade Support Battalion, 1st Armored Brigade Combat Team, 1st Infantry Division, at Fort Riley, Kansas. He has served in the 513th Military Intelligence Brigade (Theater), and 1st Cavalry Division. He holds a Bachelor of Science from the United States Military Academy.

Feature Photo
Soldiers from the 101st Brigade Support Battalion, 1st Armored Brigade Combat Team, 1st Infantry Division, established initial occupation operations of the brigade support area site 2 during Combined Resolve XVI on Dec. 12, 2021, in Hohenfels training area, Germany. (Photo by Capt. Karl Knowlton)

Sustainment
Review and Analysis

8th TSC Strives for Excellence

■ *By Maj. Gen. David Wilson and Chief Warrant Officer 4 Robert Navarro-Morales*

For most of the last 20 years, the U.S. Army has been consistently engaged in conflict in Iraq and Afghanistan. The resulting tempo significantly changed how tactical units executed maintenance and supply operations. Sustained conflict in the Middle East required units to leave equipment at their home station in the left-behind equipment program while using theater-provided equipment upon arrival in the theater. This structure forced units to employ contracted solutions to maintain equipment readiness. The end of wars in Iraq and Afghanistan, coupled with the Department of Defense budget cuts, has led to the elimination of contract maintenance solutions for tactical units. However, the over-reliance on contract maintenance for more than twenty years atrophied fundamental maintenance and supply skills and processes at the tactical level of sustainment. Tactical units must reestablish fundamental maintenance operations to regenerate the garrison and field maintenance skills that directly impact readiness before the next global conflict. To combat this atrophy and get back to the basics regarding maintenance and supply operations fundamentals across the Indo-Pacific area of

responsibility, the 8th Theater Sustainment Command (8th TSC) has implemented the theater sustainment review and analysis (TSR&A).

Theater Sustainment Review & Analysis

The 8th TSC TSR&A was established in fiscal 2020 by Maj. Gen. David Wilson, commander of the 8th TSC, to gain greater visibility of materiel management and operational readiness across the Indo-Pacific theater. A review and analysis is not a new concept. This function was a key activity performed by the corps and division material management centers—corps support commands (COSCOM) and division support commands (DISCOM)—originating from the Army of Excellence circa the 1980s. When the Army moved to a modular structure with the brigade combat team becoming the unit of action, the material management centers of COSCOM and DISCOM were changed. Leaning on this history, the 8th TSC Distribution Management Center established the TSR&A and identified a myriad of issues across the theater with materiel management and operational readiness. After close examination, all issues could be traced back to the atrophy of basic materiel and maintenance operations at the tactical level by maintenance and supply managers.

The 8th TSC hosts a quarterly TSR&A to assess the theater's sustainment unit readiness and materiel management. Each unit is measured against Department of the Army (DA) standards using metrics that assess readiness and materiel management performance. The TSR&A leverages the Global Command and Control System-Army data analytics to enable strategic sustainment leaders and organizations to "see themselves." The data analysis of materiel management and readiness trends across the theater enables the sustainment community to track performance and modify behaviors while simultaneously improving readiness across the Indo-Pacific area of operations (AOR). The TSR&A also is used to identify areas where the material enterprise can be leveraged to address trends negatively impacting readiness. Highlighting problem areas and opportunities for improvement during this forum offer insight into how the sustainment enterprise can proceed with future investments, initiatives, and decision-making at the strategic level. Lastly, the TSR&A serves as a platform to educate the sustainment community through a unified community of practice approach. Since the establishment of the TSR&A, there has been a continuous improvement in materiel management and readiness within the Indo-Pacific theater.

Theater Sustainment Review & Analysis Structure

The TSR&A is a deliberate approach to improve materiel management and readiness across the theater. It is executed quarterly to allow time to measure the effects of changes to processes after implementation. The audience for the forum includes senior leaders from strategic enabling commands, along with unit warrant officers who provide expertise in maintenance and supply operations. The data analysis provides a comprehensive view of materiel management and readiness by analyzing maintenance and supply data trends across several key areas, including fleet readiness, equipment divestment, supply support activity performance metrics, and special topics.

Fleet Readiness Review

During the TSR&A, fleet readiness is reviewed to identify the operational readiness of critical fleets. The Enterprise Materiel Status Reporting (EMSR) and Daily Status Report examine ground and aviation fleet readiness using data analytics tools. The data is compiled monthly by regional maintenance managers and enables sustainment leaders to quickly assess operational readiness rates based on fleet trends and equipment availability. The EMSRs are displayed during the TSR&A, providing sustainment leaders fully mission capable (FMC) line items number (LINs) and non-mission capable (NMC) LINs, in a commonly understood color status of green, amber, red, and black. FMC ground and aviation fleets are depicted in green, while NMC fleets are reflected in amber, red, or black. Aviation fleets are considered "broken" when the equipment readiness rate falls below the DA readiness goal of 75%, and ground fleets are considered "broken" when the equipment readiness rate falls below the DA goal of 90%. The TSR&A is designed to highlight LINs that do not meet DA readiness standards and identify the causality of faults among "broken" LINs and reoccurring trends.

During the fleet readiness review, LINs are analyzed, focusing on maintenance drivers, work orders, and common trends. Maintenance drivers fall into two categories: scheduled or unscheduled maintenance. Maintenance managers can analyze work orders and distinguish between those requiring high priority and non-priority repair parts. This data aggregation enables maintenance managers to identify fleet trends and recommended solutions to improve readiness. The TSR&A identified common trends negatively impacting readiness within the Pacific theater—long-lead-time parts, equipment availability constraints, the effects of inclement weather, and coastal duty locations in Alaska, Hawaii, and Guam.

Fleet readiness improvement requires units to dedicate time to execute basic maintenance and materiel functions and aggressive management of maintenance operations. The examination of fleet readiness through the TSR&A identified that long lead-time parts consistently impact ground engineer equipment readiness, which is being addressed at the enterprise level. Additionally, the review identified opportunities to improve readiness rates through proper preventive maintenance checks and services, reporting, and deliberate installation of parts on hand. Since implementation, the 8th TSC has seen an overall decline in failed LINs by 22 from the previous quarters due to the implementation of practices discussed during the TSR&A.

Equipment Divestment

The TSR&A also examines equipment divestiture and re-distribution across the Pacific. The equipment divestiture status in the Pacific is measured against the DA equipment divestiture goal to ensure alignment with the Total Equipment Management Strategy (TEMS) program established by Army Materiel Command (AMC) in fiscal 2020. The TEMS was introduced to accelerate the removal of excess and obsolete equipment as the Army prepares to modernize through the Regionally Aligned Readiness and Modernization Model (ReARMM). During the TSR&A, maintenance managers and sustainment leaders analyze divestiture of excess metrics, property management, and future fielding requirements. The Army currently has more than 700,000 pieces of excess equipment, negatively impacting the ReARMM mission and making equipment divestment a key focus during the TSR&A.

The TEMS tracker is reviewed during the TSR&A. It provides sustainment leaders a snapshot of projected and completed divestments for each unit assigned to the U.S. Army Pacific. Unit divestment activity requires continuous monitoring, and including this topic in the TSR&A has increased divestment activity quarter over quarter across all regional units. The special emphasis placed on achieving 100% divestment of excess and obsolete equipment is critical to successful new equipment fielding. It enables commanders to focus manpower and funding on maintaining 100% of the authorized modified table of equipment to maintain combat readiness. Additionally, the TEMS review provides visibility of excess equipment on a valid proposed sourcing decision. It enables units to increase readiness through equipment redistribution within their commands and the Army.

The TSR&A also examines Modernization and Displacement Repair Site (MDRS) operations within the Indo-Pacific using the Divestiture Fusion Chart. MDRS facilitates the divestment of excess and obsolete equipment across the Army. In fiscal 2021, the Army Material Command established 14 MDRS sites throughout the U.S. to reduce excess equipment at major Army installations. The use of MDRS sites increases readiness by relieving units from the responsibility of preparing and shipping excess and obsolete equipment to Army depots. The review of MDRS activity has generated an increased turn-in of excess equipment across the Indo-Pacific theater since fiscal 2021, especially for "as-is" obsolete items.

Supply Support Activity Performance Metrics and Class IX Material Management

The TSR&A thoroughly examines Supply Support Activity (SSA) performance metrics to ensure maintenance managers and commanders understand the factors

Metrics Business Rules		
Metric	**Data Source**	**Comments**
CWT	GCSS-Army BI	CWT reflect CL IX HI-PRI (01,02,03) request only.
MSP Fill Rates	GCSS-Army BI	MSP Fill Rates reflect CL IX HI-PRI (01,02,03) requests only. Per AMC guidance ISSAs are not measured against MSP Fill Rate goals.
ZPARK Performance ZPARK Snapshot	GCSS-Army BI GCSS-Army (USARPAC G8)	This metric is the ZPARK metric from monthly CWT for all priorities and classes of supply. ZPARK slide reflects data of the "as of date" only for all priorities and classes of supply.
ASL Review	Stock Determination Branch/ AMC Installation Supply Representative.	

Acronyms	
Customer Wait Time (CWT)	Measures how quickly the supply chain fills requests to unit-level customers.
Requisition Wait Time (RWT)	Measures how quickly the supply chain fills non-back ordered requisitions to SSA-level.
ZPARK	A financial approval activity that checks on the availability of funds.
Release Strategy (RS)	A logistics approval step early in the process of ordering parts.
Outbound Delivery (OBD)	The time between an order to the national level from the supply support activity (SSA) and delivery of the order to the SSA.
Post Goods Issue (PGI)	The time between delivery to the SSA and posting of the part to the customer's bin at the SSA (SSA processing time).
Post Goods Receipt (PGR)	The time between posting to the customer's bin at the SSA and the customer's retrieval of the parts from the SSA (Customer picks up from SSA).
Maintenance Significant Parts - Fill Rate (MSP-FR)	Measures the performance of an SSA to satisfy a request identified as maintenance significant. It is expressed as a percentage of the SSA's demand accommodation multiplied by demand satisfaction.
Demand Accommodation	Is the percentage of all valid demands received which match the items on the ASL.
Demand Satisfaction	Is the percentage of all valid demands for ASL items that were filled to a level of at least 90 percent.

Business rules used to evaluate Supply Support Activity metrics. (U.S. Army Graphic)

impacting readiness rates. During the review, the focus is given to Class IX high priority requests that directly impact readiness metrics, customer wait time (CWT), maintenance significant parts fill rates (MSPFR), and authorized stockage list (ASL) performance are critical metrics that measure readiness through maintenance and supply operations. The figure above identifies the business rules used to evaluate SSA metrics. There are five critical SSA metrics: ZPARK, release strategy, outbound delivery (OBD), post goods issue (PGI), and post goods receipt (PGR). These metrics provide resource managers (commonly S-8, G-8), execution managers (commonly support operations, S-4s), SSA managers, and requesters a mechanism to measure their performance against DA standards. Once educated about the various data points at their disposal, commanders are empowered to actively manage and analyze the metrics generated from their respective areas of responsibility.

The initial 8th TSC TSR&A highlighted the need for a "back-to-basics" approach to improve CWT metrics. It enabled materiel managers and commanders to affect change at the operational level. Commanders were educated on how they can directly influence CWT through education, emphasis, and process establishment. Item managers at AMC can impact OBD through direct responsibility for assigned Army-managed repair parts, management of sources of supply, and maintaining adequate on-hand inventory via distribution to storage sites worldwide. Commanders were informed that OBD is affected by multiple suppliers, distributors, and transportation constraints within the supply chain. Although commanders could not directly affect OBD, they were educated on the process. The review results have been positive, as demonstrated by the theater meeting the Class IX high-priority CWT DA goal (15 days) when it decreased from 21 to 13 days during the 30 days between January and February of 2022. Additionally, we saw improvements across all segments of CWT improved in direct response to commanders' emphasis on making daily parts pickup, monthly reconciliations of document control registers, and ZPARK management across their formations into battle rhythm events during the same period.

The Theater SSA common operating picture is another data point examined during the TSR&A. It illustrates MSPFR at SSAs across the theater. ASL fill rates are critical to unit readiness and are monitored to ensure the appropriate Class IX is stocked in tactical SSAs to maintain readiness. The DA goal is currently 60%. However, after examining this performance metric during the TSR&A the 8th TSC identified that the Indo-Pacific theater was 2% below the Army goal in fiscal year 2021. After a continuous review of this metric, several units in the Indo-Pacific theater converted to a common authorized stockage list to improve MSPFR.

The analysis of SSA performance metrics during the TSR&A has improved customer requisition accuracy by implementing supply management procedures including, validating requests through monthly reconciliations, revising internal/external standard operating procedures (SOP), maintaining processing velocity, and maximizing available funds execution to improve readiness. The TSR&A is a driving force to promote actionable outputs, education, and visibility to empower materiel managers and commanders to solve supply issues within their organization.

Special Topics

Special topics are discussed during the TSR&A with commands participating in working groups and the council of colonels leading up to the 2-star general officer steering committee. Special topics include the MDRS policies and procedures, End-of-Year ZPARK execution strategy impacts, low-density equipment readiness rates, and theater authorized stockage list review initiatives. Special topics enable commanders to discuss sustainment issues and concerns impacting unit readiness.

Conclusion

The 8th TSCR&A is a forum that provides a deliberate and proactive approach to assist maintenance and materiel managers and commanders in seeing their unit from a materiel management and readiness perspective. The TSR&A can be used in any theater to examine and improve materiel management and operational readiness. Since its implementation, the forum has reinforced the fundamental principles and processes of maintenance and supply operations that have atrophied over the last two decades. The TSR&A has proven to be instrumental in increasing readiness across the Indo-Pacific AOR writ large by leveraging data analytics to inform decisions at the operational and strategic levels. With Wilson's "get back to the basics" approach, sustainers across the Indo-Pacific theater have changed their mindset by focusing on developing and refining systems, processes, and procedures. As a result, units established processes and procedures through the publication of internal and external SOPs; streamlined reporting timelines for maintenance and supply processes; expedited excess turn-in; decreased CWT and requisition wait time; and enhanced the ZPARK performance, PGI, and PGR, resulting in increased equipment readiness rate across the region. The combined and synchronized effort and command emphasis facilitate regulatory compliance and ensure a readiness posture, enabling units to respond in a crisis and win in conflict.

Maj. Gen. David Wilson is commanding general of the U.S. Army 8th Theater Sustainment Command, Fort Shafter, Hawaii. Previously, he served as Director of Logistics, U.S. Forces Korea/U.N. Command, and Deputy Director of Logistics, Combined Forces Command, in the Republic of Korea. He was the Army's 40th Chief of Ordnance. He is a Distinguished Military Graduate of the Citadel, the Military College of South Carolina, and holds a master's degree in general administration from Central Michigan University and a master's degree in national security and strategic studies from the National Defense University.

Chief Warrant Officer 4 Robert Navarro-Morales is the officer in charge for General Supply Office, Support Operations, 8th Theater Sustainment Command, Fort Shafter, Hawaii. Previously, he served as senior logistics planner, Defense POW/MIA Accounting Agency, Joint Base Pearl Harbor Hickman, Hawaii. Before that, he was the Supply and Services Chief, 19th Expeditionary Sustainment Command. He is a graduate of The American Military University, West Virginia, where he holds a bachelor's degree in business administration.

Feature Photo
U.S. Army Soldiers, assigned to the 8th Special Troops Battalion, 8th Theater Sustainment Command, sign out radios during weekly motorpool maintenance on Fort Shafter, Hi., July 09, 2019. Soldiers conducted a weekly PMCS on their vehicles and logged any deficiencies on a DA Form 5988. (Photo by Spc. Geordan J. Tyquiengco)

Observe Communicate

An Innovative Way to Defend the Support Area

■ *By Maj. Alex Brubaker and 1st Lt. Kevin Rutherford*

Base defense is always highlighted as an issue when the Combat Training Centers (CTCs) release their top 10 sustainment trends each year. Highly trained opposing forces (OPFOR) can consistently disrupt sustainment formations. Simply, we do not receive the training repetitions or have the experience that the average infantry Soldier does. Collective base defense is trained once or twice a year and nowhere near the standard needed during large-scale combat operations (LSCO) or what a CTC will prepare units for. Many combat sustainment support battalions come together piecemeal from active duty, Army Reserve, and National Guard, forming an ad hoc organization that has not trained together before hitting the ground in wartime or at a CTC. How can sustainment headquarters rapidly assess and communicate the situation to marshal collective action over a support area that could be more than half a mile in diameter?

The current modified table of organizational equipment (MTOE) for sustainment battalions does not have enough individual communication devices for mass distribution, such as the multi-band Army/Navy Portable Radio for two-way Communication (AN/PR-152s). While Single Channel Ground and Airborne Radio Systems, such as the RT-1523, can be used as manpacks, they are predominantly used for vehicles. Often, Soldiers are spread out between fighting positions, commodity areas, field maintenance sites, and sleeping tents when an attack on the division support area (DSA) or brigade support area (BSA) occurs. Alerting the formation to defend the perimeter before the threat is inside the wire is challenging. There is no quick mechanism to inform en masse the type of threat: direct fire (DF) or indirect fire (IDF); Chemical, Biological, Radiological, or Nuclear; and others, as well as the immediate actions to take against the threat. Providing situational awareness with speed is pivotal to success in LSCO and CTCs.

This article proposes two solutions to enhance the sustainment battalion's capability to rapidly identify, assess, and communicate threats to the support area. The 13th CSSB "Pioneers" nicknamed them Pioneer Eye, a base defense operations center (BDOC) camera, and Pioneer Voice, a loudspeaker system with pre-programmed alerts.

Pioneer Eye

Many bases had access to Lockheed Martin's Persistent Threat Detection System in Iraq and Afghanistan. This giant helium balloon provided long-range intelligence, surveillance, and reconnaissance capability. Some small outposts or units were enabled with Teledyne FLIR's Cerberus cameras—a trailer-mounted, 360-degree camera. This equipment significantly increased survivability through enhanced threat detection, yet the Army never codified these capabilities on an MTOE. In LSCO, our sustainment battalions are likely to be under-protected or on their own. Maneuver commanders prioritize combat power toward maneuver objectives, leaving sustainers to defend themselves. Bypassed enemy forces ranging from single vehicles to entire companies alongside irregular forces are consistent threats to sustainment formations. Imagine if you could identify an enemy vehicle or squad a mile out. Even one minute of advanced notice can enable a more effective defense.

Why shouldn't the BDOC or Tactical Operations Center (TOC) have a capability that constantly scans the perimeter, locating any movement to alert the staff? Many initial spot reports lack accuracy and timeliness. When a fighting position reports enemy forces skirting the perimeter, a BDOC camera can quickly scan the area to get an accurate account of the threat.

As the 13th CSSB trained base defense before its National Training Center (NTC) 22-03 rotation, we recognized the threat detection gap and remedied it through a commercial off-the-shelf solution–the Pioneer Eye. Pioneer Eye is a Montevue 8MP 4K Pan-Tilt-Zoom camera with 25x zoom, auto-tracking, and 500 feet of starlight infrared (IR) night vision. It was selected based on its affordability and capability. It enables a live view of inside and outside the DSA/BSA. This camera enabled the

13th CSSB's TOC and BDOC to view the entire perimeter. We often viewed the attack's live feed to clear the confusion, request support earlier, and provide eyes on the threat. The 500 feet starlight IR emits no IR signature and extends the detection range at night. The 25x zoom and 4k picture quality enable a clear live picture of what is happening.

The camera automatically tracks and follows humans and vehicles while alerting camera operators. It simultaneously records and takes snapshots of the alert as well. This feeds intelligence reporting by taking pictures of the enemy and attaching them to reports. Anyone within the network can be granted access through a username and password to view or control the camera. Multiple cameras can be tied together to form a video wall for the BDOC or TOC to view or control all cameras from a central location.

Employing Pioneer Eye at NTC

The entry control point reported a dust cloud in the distance with what appeared to be two vehicles. The 25x zoom capability enabled the unit to see that those vehicles were with range control, preventing an unnecessary elevation of force protection conditions (FPCON). If the protection levels were raised without need, our convoys would lose essential preparation time and potentially miss their starting point time while simultaneously reducing our maintenance posture in favor of security. In the fog of battle, threat assessments can sometimes take up to two hours, losing valuable time; a threat detection system can prevent this loss of time.

The BDOC received initial reports from multiple fighting positions with different numbers of OPFOR vehicles and personnel attacking the perimeter. Another report of an enemy breaching the perimeter came in without location data, so radio communication did not paint an accurate picture of the threat to provide the location(s) to surge quick reaction forces (QRF). Pioneer Eye performed a quick perimeter scan, enabling the BDOC to channel resources toward the enemy and counter the threat. The enemy then

A image captured with the Pioneer Eye system shows 13th Combat Sustainment Support Battalion's maintenance activities Jan. 11 during a training event at the National Training Center in Fort Irwin, California. (Photo by 1st Lt. Kevin Rutherford)

The Pioneer Eye and Voice system is shown attached to a pole while being used Jan. 22 during a rotation of the National Training Center in Fort Irwin, California. (Photo by 1st Lt. Kevin Rutherford)

moved toward the aviation element in a base cluster nearby. The unit used the Pioneer Eye to monitor the aviation element's perimeter and pushed reports to their TOC through a joint battle command platform and frequency modulation communication devices to aid their base defense.

Pioneer Voice

Threat detection is only half the battle. Pioneer Eye provides clarity to command posts, but the challenge of getting all Soldiers to respond quickly to the threat remains. Most veterans are intimately familiar with the sound of the siren indicating indirect fire is incoming. All Soldiers overseas knew to move to bunkers and wait for an all-clear to begin getting accountability. Today, junior Soldiers that have not served in a theater of war do not share these same experiences. The size of a DSA could be up to a mile across when deployed in its entirety. Yelling out instructions or guidance is not feasible. How does a sustainment headquarters quickly communicate instructions given the lack of communications devices by MTOE?

The 13th CSSB remedied this through an Algo 8196 IP PoE+ Horn Speaker with three Algo 1196 speakers. Selected for affordability and compatibility, the system created a 360-degree sound projection public announcement system. Sound files were recorded of various alerts for IDF, DF, and gas. Additionally, the BDOC is hard-wired into the public address (PA) system, enabling users to broadcast additional instructions like FPCON changes, test fire notifications, or other pertinent information.

Using Pioneer Voice

The DSA took IDF early in the morning. It turned out to be a cyanide gas attack. The battalion TOC turned on the "Gas, Gas, Gas"

alarm, followed by the required mission-oriented protective posture level. This allowed everyone on the DSA to react instantly to the threat.

Pioneer Eye picked up OPFOR in the distance. They had not attacked yet, but we needed to raise the FPCON level to Delta quickly. Instead of using a siren alert, we simply utilized our PA system to quickly get Soldiers into an elevated threat level to prepare for contact.

Equipping Units

To use Pioneer Eye and Voice, units need a Windows 10 computer. The S6 shop can then enable the Windows 10 built-in feature Hyper-V to serve as a call manager for the voice over Internet protocol (VOIP) phones. Any dynamic host configuration protocol device (routers/switches) can manage the network's Internet Protocol (IP) space and assign static IPs as required. Units will need to ensure the devices are compatible with one another. The system is scalable with additional equipment—cameras and speakers, VOIPs, switches, etc. The system is operated on an internal network and thus hard to penetrate with a cyber-attack.

A peer security pole designed for individual companies can also be created with less cost by reducing the switch, VOIPs phones, and some speakers from the root security pole. This enables individual companies to have similar capabilities and enhance detection and communications for the collective footprint.

Units who want these capabilities must order them through their government purchase card (GPC) at their local base supply center (BSC). The BSC will acquire the three quotes and return the single-page quote to the GPC holder. Additionally, local BSCs can special order equipment, not on the catalog. A single GPC Request Form with a BSC quote is all that is usually required for the S-4 or G-8.

Conclusion

Sustainment battalion headquarters have no MTOE threat identification capabilities, nor do they have mass communications capabilities. In a LSCO fight, any sustainment headquarters separated from protected nodes that do not make the defended asset list will face increased threats. This is replicated through CTCs, where sustainment headquarters often fight on their own. CTC's top 10 trends always indicate sustainment units need more help with base defense. Any additional ability to increase protection and respond quickly to the enemy will pay dividends to Army units. This is a capability that can improve survivability on the battlefield.

The 13th CSSB developed a solution that enabled better protection. The observer coach/trainers at NTC had not seen such an innovative capability to assist with base protection. Sustainment battalions should purchase these commercial off-the-shelf products for the battalion and companies to facilitate increased survivability. Combined Arms Support Command should identify any protection gap in sustainment headquarters and seek to develop a capability to serve as a program of record and codify a solution for sustainment MTOEs. Pioneer Eye and Pioneer Voice were utilized heavily during our NTC rotation and generated faster threat assessments and information dissemination. They were crucial to executing a collective base defense and winning at NTC and will help save lives in a future conflict.

Maj. Alex Brubaker currently serves as the support operations officer for the 13th Combat Sustainment Support Battalion. He received his commission from the University of Michigan, and Command and General Staff College. He holds a master's degree in supply chain management from Kansas University and a master's degree in operational studies from CGSC.

1st Lt. Kevin Rutherford currently serves as the S-6 for the 13th CSSB. He achieved the rank of sergeant first class before commissioning as a Signal Officer from Cameron University ROTC in May 2020. He holds a master's degree in organizational leadership and completing a master's degree in information technology. He holds industry certifications for CompTIA Security+ and Cyber Security Analyst.

Feature Photo
The Persistent Threat Detection System is maintained by civilian contractors from Lockheed Martin to observe and support International Security Assistance Force elements from high above the battlefield. The PSDS is a tethered aerostat-based system, capable of staying aloft for weeks at a time and providing round-the-clock surveillance of broad areas. The Army began using PTDS in Afghanistan and Iraq in 2004. (Photo by Lockheed Martin)

Organizational Change Management

Co-Creating the Army's Next Generation Enterprise Business System

■ *By Michcell L. Shoultz*

"Seventy percent of corporate transformation efforts are doomed to fail." International change leader and Harvard Business School professor Dr. John Kotter made this dire assertion more than 25 years ago, and it has since proved very prescient. With the Army embarking on one of its largest business system transformations, the Enterprise Business Systems-Convergence (EBS-C) team needed to find a way to defy Kotter's alarming prediction and optimize the Army's business activities to support the warfighter. Enter a concept known as co-creation.

Co-creation is defined by Renée Dineen, a bestselling author, and organizational psychologist, as "the intentional and yet organic process of bringing together different groups and perspectives to jointly produce a mutually valued outcome."

Co-creation means flipping the script in a digital transformation. Do not build buy-in after you design, develop, and test new technology. Instead, co-create change from day one. Rather than peddling change after the fact in deployment, co-creation requires participation from those who understand the processes and needs of the business from the very beginning of the project. In the case of Enterprise Business Systems—Convergence (EBS-C), that means not conducting business as usual and breaking down silos. Let's begin with an introduction to EBS-C.

What is EBS-C?

The current suite of Army Enterprise Business Systems (EBS) was state-of-the-art when they were introduced, but in today's environment, they lack the agility and capacity to seamlessly share information among systems and commands. As the Army increases its efforts to improve tactical and strategic readiness and modernize its business systems, the requirements and approaches supporting EBS must be modernized to improve business execution, data and data analytics value, and cloud computing advances while reducing ownership costs.

On March 26, 2020, the Under Secretary of the Army chartered EBS-C to deliver a modernized war-fighting capability that enables integrated and auditable sustainment operations from the strategic support area to the tactical edge of the battlefield, enabling decision making by Soldiers, the civilian workforce, and leaders at every echelon.

EBS-C is slated to combine at least four of the Army's Enterprise Resource Planning programs and massively improve system agility, capacity, speed, and efficiency. The General Fund Enterprise Business System, Global Combat Support System-Army, Logistics Modernization Program, and Army Enterprise Systems Integration Program hub are the primary systems being considered for convergence.

The new system, with an intention to go live within the next 10 years, would tap into advanced technologies such as artificial intelligence, robotic process automation, and constantly learning algorithms. These are all variables that would enable and support business process transformation. That said, the most important variable for EBS-C are the stakeholders—the hundreds of thousands of Soldiers and civilians that process more than 75 million business transactions annually. Globally, this amounts to more than 190,000 users interacting with platforms that impact every aspect of the Army's business operations, from ordering supplies in theater to supporting maintenance activities in garrison.

Organizational Change Management as the Key to Co-Creation

Given that co-creation is not the natural state of large and complex digital transformations, EBS-C began with the proposition that business as usual would not lead to success. After all, the Army is fundamentally changing its business practices and processes, not to mention its technology. EBS programs of the past delivered many accomplishments and opportunities for improvement.

Leveraging this legacy sweat, EBS-C is executing an approach based on the inclusion of key stakeholders in all aspects of the project and every phase of the lifecycle. To aid in this effort of busting traditional silos, the Army created the EBS multi-functional capabilities team (EBS-MFCT) to bring the functional community together to drive requirements for the future system, rather than organizations separated by function. To foster the inclusion of stakeholders in systematic ways on this difficult journey, the Army added a small but important team to the project—the Organizational Change Management (OCM) team—the central engine for co-creation. The Association of Change Management Professionals defines change management as "the practice of applying a structured approach to the transition of an organization from current state to future state to achieve expected benefits." EBS-C would be the largest business modernization effort in Army history and would transform the core of how the Army does business. This type of transformation does not happen on its own, nor can it be created in a vacuum. The OCM team, with a mission to deliver tools and techniques to drive cultural change and build relationships needed to maximize change adoption, focuses on placing humans at the center of the change to mitigate common causes of failure.

Methods and Tools

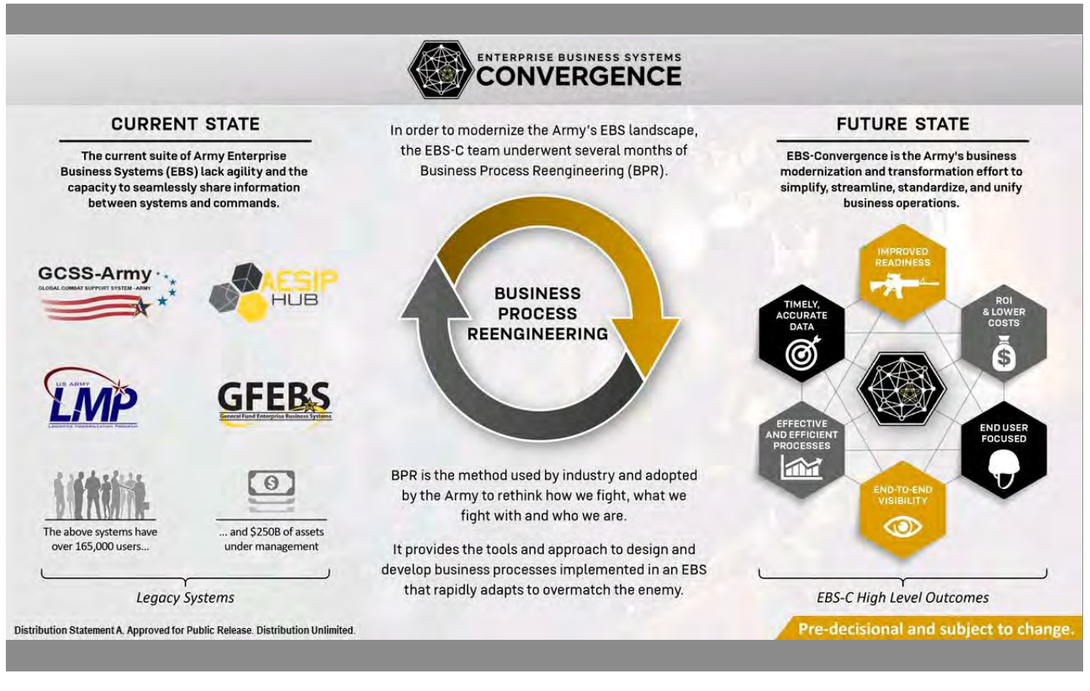
To frame these efforts, the team developed its own change approach, inspired by best practices and research in the fields of change management, organizational development, applied behavioral sciences, and neuroscience. Several change methodologies and process theories influenced the development of the OCM team's approach, including heavy inspiration from John Kotter, whose 'Eight Steps to Change' has become part of Army doctrine, culminating in an approach that is definitively "People First."

Kotter's eight-steps outline the journey organizations should consider when implementing large-scale change. These steps include:

1. Create a sense of urgency
2. Build a guiding coalition
3. Form a strategic vision and initiatives
4. Enlist a volunteer army
5. Enable action by removing barriers
6. Generate short-term wins
7. Sustain acceleration
8. Institute change

The OCM team is either leading or supporting every facet of Kotter's methodology in its approach and applying it in an iterative manner for each phase of the project lifecycle. One example is the creation of a change coalition. Set to launch this fall, the EBS-MFCT change coalition will be a set of three different stakeholder groups to serve various purposes. Whether it is a coordination of senior leadership or change advocates who understand and value the project, the change coalition will be one, if not the most, important effort led by the OCM team.

One of the processes the OCM teams will utilize to help with such behavior change and its effort



EBS-C business process reengineering. (U.S Army Graphic)

to co-create is human centered design (HCD). Global Design Firm IDEO defines HCD as "a process that starts with the people you're designing with and ends with new solutions that are purpose-built to suit their needs. It is about cultivating deep empathy with the people you are designing with; generating ideas; building prototypes; sharing what you have made together; and eventually, putting your innovative solutions into the world."

Co-Creation in Action

The OCM team is mindful that when leveraging the various change methodologies, tools, theories, and approaches that enable the transition from current to future state, the end goal is to help people adapt their behavior, one person at a time. Those impacted by the change need to understand the value and the why of the change in order to respond, but more importantly, be instrumental in the change process.

Stanford Professor Benham Tabrizi says it best in his Harvard Business Review article titled, *Digital Transformation* is Not About Technology, where he highlights key lessons that have helped organizations successfully traverse digital transformations. Two of these lessons are to "leverage insiders" and "design customer experience from the outside in," both central to co-creating change. Although the project is early in its lifecycle the OCM team has already applied these principles in collaborations across the project—by developing guiding principles (as listed below), infusing organizational change into business process reengineering (BPR), and establishing foundational feedback loops with stakeholders—to enable co-creation from the beginning.

- Challenge the Status Quo. Break the boundaries of what is possible and challenge the way things have "always been done."
- Value People First. Create value in partnership with the EBS community to benefit the warfighter and workforce.
- Embrace Change. Adopt a growth mindset in all actions that enables the team to improvise, adapt, and overcome.
- Practice Radical Honesty. Embrace productive conflict to drive productive disruption. Foster a safe environment to share and challenge ideas. Communicate with authenticity, respect, and truthfulness.
- Create One Team, One Fight, One Product. Seek out partnerships, erase the line between "us and them," and use lessons learned from those who have come before to achieve a common mission.

Business Process Reengineering

BPR is an excellent conduit for co-creation. As illustrated in EBS-C business reengineering graphic, BPR efforts take a holistic view of current and future states, and considers the people, process, information, policy, and technology impacts to fix problems and achieve goals. During these efforts, the project team, in coordination with the OCM team, works with and for the warfighter and those that support them. Specifically, during the BPR effort, project leaders look to analyze current and design the future workflows and business processes, being mindful that the analysis and processes impact stakeholders. The progressive action taken as part of the EBS-C BPR effort is that the processes are designed with the stakeholder in mind and with stakeholder contribution. In other words, end-users are not coming to understand the future state when it impacts them but are helping design what the future state looks like. The first round of BPR, conducted in 2021, included more than 400 stakeholders who contributed their expertise over seven months and produced 514 change impacts that will contribute toward the successful implementation of EBS-C. Preparations for a new round of BPR are already on the way.

Feedback Loops

The EBS-C transformation could potentially impact the entire Army, affecting how units maintain property and equipment, order parts and supplies, move themselves, and, quite possibly, touch every business segment. This is especially important for how the Army's industrial base plants, depots, arsenals, and sites could use it to sustain the force and ensure strategic readiness. EBS-C would change how the Army trains Soldiers in schools and units. Because of the broad, and relatively sudden impact, there are potential changes to how the Army prepares civilian workers around the globe. Civilians enable Army readiness by supporting Soldiers and working on staffs in every command and theater. Only by getting feedback and buy-in from this vast array of stakeholders will the Army realize the full capabilities of this unprecedented, end-to-end business system.

For example, TRADOC's Combined Arms Support Command (CASCOM) at Fort Lee, Virginia, is already considering stakeholders' user experience (UX) and training. CASCOM is part of the EBS-C team and is focused on UX. Russ Coughenour, a CASCOM enterprise training analyst, said, "We're not just developing training requirements with the end-user 'in mind,' we're developing requirements with the end-user today." Russ' involvement and his command's co-creation efforts at this early stage is a testament to the importance of considering end-users for a yet-to-be-identified system. In partnership with the OCM team, CASCOM, Army Material Command, and many other commands are approaching EBS-C as a Total Army requirement.

Additional ways the OCM team establishes feedback loops is via its leadership of the EBS-C monthly forum and Microsoft (MS) Teams channel. The forum is a virtual meeting with action officers throughout the community to share high-level program efforts and an opportunity for stakeholders to ask questions. The MS Teams "EBS Convergence Portal" was recently established to share EBS-C 101 information, news, and a sub-channel with links and recordings of the monthly forum. This portal is open to all A365 users.

The OCM team is not alone in its feedback loop efforts. It collaborates with the EBS-C strategic communications group composed of the EBS-C strategic communications team and public affairs office representatives from all major stakeholder commands. Together, they craft messaging to share project information and, even more importantly, opportunities to listen to stakeholders via periodic polls.

What's Next

Digital transformations, co-creation, human centered design, change management, business process reengineering—they are all approaches, methodologies, and tools to help guide and transform organizations. Central to all of these is that people are the primary variable for achieving transformation. Moreover, when end-users are asked to co-create from the start of the change journey, success is even more possible.

EBS-C deployment might seem a long way off, but one variable remains constant—transformation success is greatly increased when stakeholders impacted by the change, also design the transformation—via co-creation, from day one.

Who to contact/what to follow?

To learn more and keep abreast of EBS-C efforts, follow the EBS-C LinkedIn page as well as the EBS Convergence Portal via A365. For the latter, you'll find general information, news as well as a link to join the monthly forum, hosted every third Wednesday at 3 p.m. Eastern Daylight Time. To join the team, use code "85smlxy."

Michcell Shoultz leads the organizational change management team for Enterprise Business Systems-Convergence. Shoultz graduated from the Naval Postgraduate School with a Master of Science in Systems Engineering Management. She is a Certified Business Process Management Professional, trained in Lean Six Sigma and Capability Maturity Model Integration. Shoultz has worked in industry and Joint organizations and is a former U.S. Army intelligence analyst.

Strategic Sustainment

Mobility Warrant Officers a Vital Asset in Strategic Transportation Planning

By Lt. Col. Tyler D. Olsen and Chief Warrant Officer 2 Sidiq Aluqdah

At strategic seaports across the globe, the Military Surface Deployment and Distribution Command's (SDDC) transportation battalions (TBn) plan, execute, and integrate surface deployment and distribution capabilities, execute installation support, and conduct port operations to project and sustain the armed forces in support of global warfighting requirements. In the summer of 2020, 842nd TBn received their first mobility warrant officer (MWO) to help facilitate strategic transportation. This article provides insight into the essential role of the TBn MWO in assisting the command and deploying customers better understand the strategic transportation process and requirements.

Within the 842nd TBn, the MWO is assigned to the battalion's current operations team. In practice, however, the MWO was useful for both current and future operations. The MWO's unique experience and subject matter expertise in strategic transportation best served the battalion by providing enterprise "end to end" distribution deployment synchronization. Deployment synchronization entails a high degree of unit movement data analysis toward addressing potential system errors and engagements throughout the Joint Deployment and Distribution Enterprise (JDDE). The MWO's efforts sync the JDDE port operations and commercial strategic partner capabilities, including fort to port cargo timelines.

The MWO's deep unit movement data analysis prevented many problems and aided key stakeholder engagements, synchronizing fort to port cargo movement timelines. The TBn MWO's embedded expertise operationalizes the time phased force deployment data (TPFDD), conveying a shared understanding between the tactical warfighter and SDDC strategic enablers. Too often, TPFDD maintenance occurs alongside active movement planning. The MWO has a harmonizing effect on resynchronizing changes in the planning cycle. Staying abreast of changes, coupled with longer lead times of strategic sealift operations, can come with uncertainty, but throughput requirements are met with a specialized skillset that the MWO possesses. This understanding assists with planning out the sealift requirements in a manner that is more conducive to the combatant commander's intent for the flow of critical combat equipment and associated cargo. The MWO has experienced-based foresight to get ahead of the challenges at the tactical level, which is used to balance essential capabilities of throughput within the strategic seaports.

For those outside the TBn, the MWO functions as a force multiplier, mentoring fellow MWOs on creating accurate movement data to improve unit deployment planning. The battalion has increased its ability to influence pre-deployment activities at the deploying unit's point of origin, positively impacting throughput efficiencies at the strategic seaports operated by the 842nd. The experience and professional networks that MWOs bring to the TBn will continue to impact the enterprise as the Army trains and prepares for large-scale combat operations.

While the deploying unit has an inherent responsibility to adopt best practices from their lessons learned, the MWO can directly assist units with knowledge of SDDC deployment requirements, Army-wide deployment systems, and strategic movement timeline benchmarks. While not all-inclusive, deploying units will have less difficulty in the deployment planning and execution process by emphasizing the following:

- Establish a resilient command deployment discipline program with a bench to maintain a unit's readiness when personnel turnover occurs.
- Coordinate planning with SDDC representatives at the seaport no later than D-180, when timelines permit.
- Certify unit movement data accuracy within an organizational equipment list (OEL) submission against Computerized Movement Planning and Status System. Accuracy with OEL data drives the unit deployment list (UDL) validation. Late UDL validation delays obtaining proper fort to port conveyances and the actual deployment vessels. This endangers meeting the port call order and deployment timelines.
- Enter and assign or associate all secondary loads in Transportation Coordinator's Automated Information for Movements System 2.
- Declare the hazardous (DD 2890s) cargo alongside submission of the export traffic release request and funds verification and use authorization.
- Provide the solicitation for domestic rate routing request (DD 1085) through SDDC HQ commercial rail or line-haul no later than Available Load Date minus 60 days.
- Understand friction points at seaports of embarkation (SPOE)/seaports of debarkation (SPOD). For example, weather (wind and rain) destroys paper-based military shipping labels (MSL), often requiring units to reprint once the equipment arrives at port. Unit level purchase and use of Mylar MSLs to protect the scanned data in all weather conditions improve equipment processing efficiencies.
- Submit all sensitive items (DD 1907) and safety of life at seas memos no later than a week before cargo arrives at the SPOE/SPOD.
- Identify the right leadership and port support activity workforce to assist with cargo accountability, correct documentation, and maintenance issues.

Chief Warrant Officer 2 Kevin Coleman (center), the 3rd Division Sustainment Brigade mobility officer, discusses port operations with Soldiers from the 414th Signal Company, 258th Movement Control Team, and unit movement officers assigned to the Division Sustainment Troops Battalion, 3rd DSB, May 8 during a port to fort operation at the Joint Base Charleston Naval Weapons Station in Charleston, South Carolina. (Photo by Staff Sgt. Joel Salgado)

SDDC TBns will continue to play a critical role in the throughput of military cargo for the foreseeable future. As the technical transportation experts for the Army, MWOs play a crucial role in unit deployments across the globe. SDDC MWOs must serve as trusted advisors, charged with the responsibility to understand the deployment processes through a progressive strategic lens. As technical leaders, they are subject matter experts and assist in synchronizing cargo deployment across countries and oceans. This key billet requires a great deal of engagement within the joint deployment and distribution enterprise to successfully deliver critical equipment to the required location by the combatant commander's delivery date.

Lt. Col. Tyler D. Olsen currently serves as the commander for the 842nd Transportation Battalion, Military Surface Deployment and Distribution Command, located in Beaumont, Texas. He holds a master's degree in business management from Central Michigan University, Michigan.

Chief Warrant Officer 2 Sidiq Aluqdah is the mobility officer for the 842nd Transportation Battalion, Military Surface Deployment and Distribution Command, located in Beaumont, Texas. He holds a master's degree in project management from Grantham University, Kansas.

Feature Photo
Chief Warrant Officer 2 Jordan Milo, a mobility warrant officer from the 841st Transportation Battalion, Charleston, South Carolina, and the DEFENDER-Europe 21 Port of Portsmouth operations officer in charge oversees Joint Logistics Over-The-Shore container lift operations April 3, 2021, at the Port of Portsmouth, Virginia. (Photo by Johnathon Orrell)

TALENT MANAGEMENT

Career Mapping and Succession Planning Tool

By Maj. Jung (Jon) S. Lee

Starting in August 2021, the Army Talent Management Task Force (ATMTF) partnered with the Combined Arms Support Command and Army Logistics University to develop a pilot build for the Career Mapping and Succession Planning Tool (CM/SP-T). The logistics branch is ideal for piloting this tool as it is both an operational and specialty branch with broad skill sets within three converging branches along with a high density of diverse backgrounds.

CM/SP-T Objectives

The CM/SP-T provides employees and leaders with a digital tool that puts the power of talent data in their hands. Through the tool, Soldiers will see how their talents align to positions, can visualize potential career paths, identify talent gaps, and pursue interventions to close them. Leaders also will be able to harness the power of aggregated talent data to make informed decisions about training, leader development, and succession planning.

Leveraging innovative assessments and utilizing artificial intelligence and machine learning, the CM/SP-T is designed to integrate with Integrated Personnel and Pay System-Army (IPPS-A) to inform and support data-rich talent management applications that span the entire human resource lifecycle.

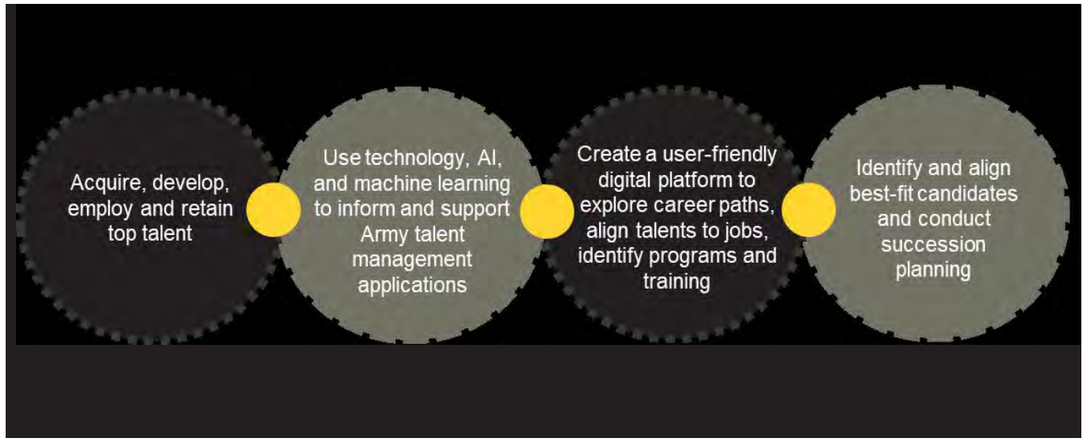
The CM/SP-T applies the Army Talent Attribute Framework (ATAF) to identify talent demands at the position level, visualize best-fit talent alignment, and serve as a developmental tool to increase retention and readiness while defining new talent data requirements for IPPS-A. Our immediate objective for the logistics branch pilot build is to operationalize the ATAF as a proof of concept using an interactive career mapping capability based on a competency alignment algorithm that will leverage knowledge, skills, behaviors, and preferences (KSB-Ps) data.

CM/SP-T Building Blocks–KSB-Ps

KSB-Ps are unique to the individual Soldier and serve as inputs when aligning talent to positions across an Army career. KSB-P data will allow the CM/SP-T to illustrate potential matches or talent fit across positions, allow the individual to create one or more unique career paths (i.e., individual development plan), identify talent gaps and interventions, and enable developmental conversations with their leadership, mentors, or coaches. A comprehensive framework and robust talent data are required to document knowledge, skills, and behaviors (KSB) demands across positions. The ATAF is the common currency that will enable the development of algorithms for talent-based analytic tools.

The CM/SP-T competency alignment algorithm will show a dynamic comparison of the KSBs possessed by an individual at a point in time against the minimum KSB talent requirements needed to execute a potential job assignment(s) effectively. The CM/SP-T, at its foundation, is a mechanism to capture measurable and quantifiable KSB-P data that will:

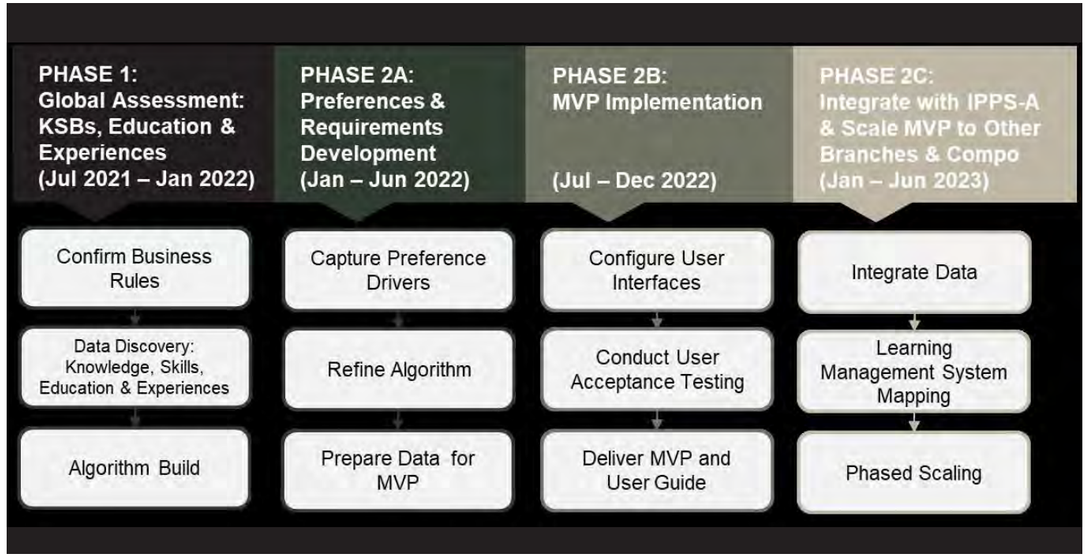
- Allow Soldiers to visualize KSB fits and pathways to further career advancement.
- Allow branches, leaders, and career managers to see talent gaps in real-time and leverage talent data to develop officers, build teams, and support individual talent alignments.
- Enhance the algorithms' ability to illustrate talent alignment over time for individuals and organizations.



Career mapping and succession planning objectives. (U.S. Army Graphic)

CM/SP-T Status

The team closed out Phase 1 (July to December 2021), the project's study phase, which included the deliverable skills matrix – underlining the preliminary KSB proficiency and criticality requirements for each of the 25



Career mapping and succession planning tool phases. (U.S. Army Graphic)

identified logistics branch positions across ranks of lieutenant through colonel. During Phase 2a (Jan. to June 2022), the team worked on the pilot development of a minimum viable product (MVP), which included the following workstreams and incorporated focus group efforts with Logistics Captains Career Course (LOG-C3) participants and subject matter expert (SME) inputs. It included:

- Competency Alignment Algorithm: work with Logistics Management Proponency Office SMEs on algorithm logic aligning KSB requirements to positions, requiring the KSB Self-Report Survey for LOG-C3 students and KSB Supervisor Survey for LOG-C3 senior leaders.
- Preferencing Identification: work with LOG-C3 students and SMEs to identify drivers that influence Soldier's decisions at different career junctions during their tenure, resulting in a Preference Survey (LOG-C3 participants) to facilitate focus group discussions for refinement.
- Succession Planning Discovery: building out use case wireframes for SME inputs to develop a leadership dashboard to support succession planning.
- CM/SP-T MVP Release 1 (Jun 2022): test with a pilot group (LOG-C3 participants).
- Phase 2b (July to Dec. 2022): migrate the instance to set up in the ArmyGovCloud for further testing and refining for MVP releases 2 and 3 with a tentative target group in mind—Command and General Staff College participants to be determined.
- Phase 2c (Jan. to June 2023) data: integration with IPPS-A and scaling MVP to other branches and components.

For more information, visit *https://talent.army.mil* or contact Talent Management at *usarmy.army-talent-management@army.mil*.

Maj. Jung (Jon) S. Lee currently serves as a data scientist assigned to the Army Talent Management Task Force and the project lead for the Career Mapping and Succession Planning Tool. He holds a Master of Science in Operations Research from the Florida Institute of Technology and a Bachelor of Science in Mathematics and Statistics from Rutgers University.

Featured Photo
Soldiers from the 536th Support Maintenance Company, 524th Combat Sustainment Support Battalion, 25th Sustainment Brigade, stand in formation during a June 7, 2018, redeployment ceremony held for the unit at the battalion headquarters. (Photo by Sgt. 1st Class Heather A. Denby)

Strategic Mobility

GCSS-A Implementation Offers Efficient Issue of Equipment

By Lt. Col. Ed Woo

Strategic levers for commanders to win our nation's wars are imperative, and one such lever is Army prepositioned stocks (APS). Field Manual 4-0, *Sustainment Operations*, states that prepositioned unit sets are equipment configured into unit sets (to include authorized stockage list), shop stock, and unit basic load, that are positioned ashore and afloat to reduce deployment response time and support the Army's force projection strategy.

During the APS-4 transition from Army War Reserve Deployment System (AWRDS) to the enterprise resource planning system Global Combat Support System-Army (GCSS-A), its capabilities enhanced the speed of APS-4 issue. For years, Army Field Support Battalion Northeast Asia (AFSBn-NEA) issued APS-4 to support missions, including live-fire exercises, equipment draws, life support, and humanitarian relief. With careful planning and implementing control measures, GCSS-A optimized expeditious issue of APS-4 equipment. AFSBn-NEA conducted GCSS-A transition in three phases: planning and preparation, pre-fielding, and fielding.

Phase I: Planning and Preparation

Training. AFSBn-NEA prioritized training requirements and ensured all stakeholders developed a GCSS-A training and certification system (GTRAC) training plan and standardization of data input into AWRDS before transition. During this period, all stakeholders worked collaboratively to schedule venues and automation equipment for training facility requirements and completed web-based GTRAC training.

Department of Defense Activity Address Code (DODAAC) Re-codification. Readiness efforts included organizing and managing unit sets, operational project stock (OPROJ), and sustainment stocks in APS-4 in a modernized automation system. Before data migration, the AFSBn-NEA readiness team ensured the re-codification of DODAACs that would synchronize with the GCSS-A database and its systems. By conducting site surveys and synchronizing with battalion and brigade key points of contact, DODAAC verification and re-codification were complete.

Data Transfer. To assist with the accuracy of data transfer in both supply and maintenance transactions,

AFSBn-NEA provided files for data input, authorized stock list, lateral property transfers, shop stock, and work orders. During this period, AFSBn-NEA prepared a data cleansing process of equipment across Camp Carroll, Camp Humphreys, Busan Storage Center in South Korea, and Sagami General Depot and Yokohama North Dock in Japan. AFSBn-NEA conducted data cleansing of OPROJ mismatches and duplicate serial numbers.

Conditions Checks. Six months before the target data migration date, AFSBn-NEA conducted condition checks with several elements including 403rd Army Field Support Brigade (AFSB), Army Sustainment Command (ASC), the Product Manager GCSS-A (PEO Enterprise Information Systems and Army Data Analytics Platforms), and Combined Arms Support Command (CASCOM). The GCSS-A fielding team assisted in coordinating a detailed schedule as AFSBn-NEA completed training requirements during pre-fielding.

Supply Support Activities. During preparatory activities, AFSBn-NEA also transitioned into its management activities supply support activities (SSA), routing identifier codes (RIC) associated with the SSAs were established, and AFSBn-NEA conducted assessments after SSA implementation.

Phase II: Pre-Fielding

CASCOM Oversight. Two months before data migration, CASCOM and the product manager team conducted the scorecard 60 days before execution. It helped ensure data reconciliation and cleansing before post go live activities at sites in Korea and Japan. The 403rd AFSB, ASC, product manager team, and CASCOM were intricately involved in the data cleansing process while equipment was transferred and became fully operational.

Care of Supplies in Storage (COSIS) Program. The COSIS program includes the maintenance and supply activities involved by executing exercise and cyclic maintenance procedures to ensure APS-4 stocks are serviceable at 10/20 standards. During the GCSS-A transition and the adjustment period, the COSIS program remained in sequence with the production schedule according to Technical Manual 38-470, Storage And Maintenance Of Army Prepositioned Stock Materiel. To adjust to the new system of record, the maintenance and supply divisions adapted GCSS-A metrics in its internal monthly readiness reporting.

Supply Division personnel from Army Field Support Battalion-Northeast Asia, load a crate of parts into a 20-foot International Organization for Standardization container for storage March 3 at Camp Carroll, South Korea. (Photo by Galen Putnam)

OPROJ, DODAACs, and Unit Identification Code (UIC) re-stratification. GCSS-A afforded opportunities to build UICs and DODAACs to execute APS-4 accountability procedures according to Army regulations for all unit sets, OPROJ, and sustainment stocks.

Excess Equipment. The log data and storage branches processed materiel release orders to each site to process excess equipment Supply personnel continued to process excess during GCSS-A conversion. Funds verification and use authorizations were processed, enabling excess items to be identified, shipped, and re-distributed to meet the Army's needs.

Phase III: Fielding

During this period, several individuals provided support during walkthroughs and site surveys, including subject matter experts from ASC and the 19th Expeditionary Sustainment Command. The augmentation teams provided oversight, and enhanced GCSS-A migration and their involvement ensured validation of the data transfer and requirements.

Daily Working Groups. The daily synchronization forums during pre-fielding and fielding proved beneficial to data migration. This was the critical forum to ensure the de-confliction of numerous technical transactions with the collaborative team coordinating to create solutions.

Data Management. The data migration team helped ensure proper reporting and accountability procedures that impacted the Army materiel status system, maintenance master data file, and maintenance management information system.

Proof of Principle

Restructuring of property accountability into GCSS-A provided a timely opportunity to test N-hour sequence procedures and contingency missions. This exercise allowed leaders to fuse the new systems into operations. Upon completion, managers demonstrated the effort and executed GCSS-A supply transactions, evaluating system procedures and updating battle drills to incorporate GCSS-A. Codification of new standard operating procedures and velocity of employment of equipment proved that GCSS-A reduced draw time for warfighting units, accelerating the issue of APS-4 equipment to the warfighter, as evidenced in subsequent real-world missions.

Until August of 2021, AFSBn-NEA issued APS-4 equipment from AWRDS and manual procedures while the receiving tactical units conducted GCSS-A property accountability; as units turned APS-4 equipment back in, AFSBn-NEA inducted the equipment back into AWRDS. In September 2021, with GCSS-A migration and AWRDS deactivation, GCSS-A streamlined procedures, contributing to the speed of issue with GCSS-A to GCSS-A transactions and expediting the issue process for the warfighter.

During this transition period, AWRDS was deactivated, and AFSBn-NEA executed operational requirements in support of multiple partners and agencies in support of readiness exercises, including support to the Korea Rotational Force and live-fire validation exercises. By modernizing the logistics automation platform to GCSS-A, APS-4 draw procedures became more efficient, minimizing the time taken at the point of issue for supported units to be issued their equipment.

Benefits of the Transition

One of the goals of the APS-4 program in AFSBn-NEA is to enable rapid employment of equipment in support of the warfighter. Transitioning APS-4 equipment across Northeast Asia to a new automation system proved to be a timely process. Still, it was able to be accomplished with the help of vested partners at the tactical, operational, and strategic levels. With GCSS-A implementation, units can be issued APS-4 equipment more efficiently in generating combat power.

Lt. Col. Edward K. Woo is currently attending the U.S. Army War College in Carlisle Barracks, PA. He previously commanded the Army Field Support Battalion-Northeast Asia. He holds a Bachelor of Science in Finance and Accounting from New York University, a master's in administration from the University of Oklahoma, and a master's in military arts and science from the U.S. Army Command and General Staff College.

Featured Photo
Army Field Support Battalion-Northeast Asia Korean National employees, members of the 210th Field Artillery Brigade, and host nation contract drivers load Multiple Launch Rocket Systems for onward movement Jan. 20 at Camp Carroll, South Korea. The newly implemented Global Combat Support System, Army, enables units to better track, account for, and maintain equipment throughout the full spectrum of operations. (Photo by Hyon-su Chong)

Autonomous Vehicles

New Technology Revolutionizes Army's Principles of Sustainment

By Maj. Brian Mathews

In the April-June 2021 edition of *Army Sustainment*, Maj. Gen. Rodney Fogg noted, "Distributed sustainment operations require the ability to be responsive and to execute in a disaggregated manner with the capability to disconnect and operate independently." His observation suggests future battlefields will be crisscrossed with drone-led resupply convoys delivering combat-sustaining ammunition, rations, and repair parts. The objectives of these interdependent missions, derived from algorithmic determinations of a commander's intent, will be synchronized and integrated across air, land, sea, and non-physical domains. Distributed sustainment operations—enabled through an integrated network of autonomous vehicles (AV)—will fundamentally change how the Army conducts tactical sustainment. Therefore, the principles of sustainment must adapt to account for this autonomous revolution.

The Army trains to fight and win large-scale combat operations (LSCO). This environment is intense, lethal, and brutal. It includes complexity, chaos, fear, violence, fatigue, and uncertainty. LSCO will challenge leaders to adapt quickly to create and maintain an advantage. Logisticians are responsible for planning and executing the tactical sustainment of combat forces in this environment. At every echelon of command, a logistician is working on calculating and synchronizing the delivery of ammunition, fuel, water, and food with the overall operational plan to sustain combat. Resupply operations have traditionally required large, cumbersome convoys traveling on congested main supply routes to deliver their cargo. AVs provide the opportunity to revamp this delivery paradigm. History demonstrates that the first mover holds an inherent advantage as new technology is created and adapted to combat. Conversely, the side that grasps the last war's tactics is at a disadvantage. AVs will revolutionize the conduct of logistics.

Logisticians use the principles of sustainment to help guide rapid tactical decisions in this volatile, uncertain, and chaotic environment. These principles are anticipation, continuity, responsiveness, integration, simplicity, improvisation, survivability, and economy. Most of these principles will continue to apply in future conflicts as they have done so for centuries. The Red Ball Express in the European Theater of WWII exemplifies why simplicity and continuity are essential to keeping the offensive momentum moving forward. The Red Ball's travel routes, departure times, and cargo prioritized the movement of men and material forward, creating continuity in the resupply of forces upon which commanders and planners could depend. The Red Ball Express created predictability amid the chaos. A logistician's ability to respond to new demands, integrate support across the operations at all echelons, and improvise to overcome obstacles will remain hallmarks of a successful sustainer.

The timeless nature of these principles is their greatest strength. However, autonomous warfare will change the nature of war, and autonomous combat support platforms change the overall calculus of sustainment and two principles: survivability and economy.

Survivability, in particular, will be less relevant. Along the supply lines of Iraq and Afghanistan, the enemy focused on preventing large, lumbering, slow-moving convoys traveling on established supply routes from reaching their destinations through improvised explosives devices (IEDs), a rudimentary form of automated combat. A Congressional Research Service study found that from 2006 to 2021, approximately 46% of service member deaths in Afghanistan resulted from IEDs. Semi-autonomous and autonomous vehicles offer the opportunity to significantly reduce the number of troops required to conduct a convoy. The Army is developing leader-follower technology, which allows a manned lead vehicle to travel along a route and have some semi-autonomous vehicles following along in the sequence. A hypothetical 20-vehicle convoy with a driver and assistant driver per vehicle equates to a massive reduction in required manpower from 40 Soldiers to two. Eventually, this leader-follower concept would be adapted so all vehicles are remotely driven, similar to remotely piloted drones, or are entirely autonomous, which will eliminate the risk of small squads of Soldiers crossing the battlefield on their own. Without Soldiers in the vehicles, commanders will be relieved from one of their most consequential decisions of ordering Soldiers into harm's way.

The threat of offensive AVs is the strongest impetus that will drive the incorporation of AVs into tactical sustainment. In LSCO against a peer threat, the U.S. will no longer be guaranteed air superiority. Recent 21st-century conflicts, like the Nagorno-Karabakh, demonstrate how loitering drones can be applied with devastating results to static and unprotected targets. A downfall of large resupply convoys is their predictable movement along standard routes. Common defensive tactics like changing the route or time of travel will not be effective against one or two loitering drones positioned at bridges or crossroads. This threat will halt the resupply of the main effort and delay an advance. To address this challenge, the field of logistics must migrate away from the principle of economy and leverage the scale offered by an autonomous fleet. Field Manual 4-0, *Sustainment Operations*, defines economy as "providing sustainment resources in an efficient manner that enables the commander to employ all assets to the greatest effect possible." This principle will be replaced due to the widespread use of autonomous

A convoy of semi-autonomous palletized load system vehicles roll past attendees during a vehicle dedication ceremony April 10, 2019, at Fort Bliss, Texas, for 16 fallen Soldiers from the motor operator transport military occupational specialty. (Photo by Jerome Aliotta)

The threat of offensive AVs is the strongest impetus that will drive the incorporation of AVs into tactical sustainment.

vehicles. The days of large, double-digit vehicle convoys will be over, and a new principle will accompany this necessary transition: flooding the zone.

Flooding the zone requires leaders to think outside of historical precedents. Under this construct, AVs covering the last tactical mile will include a mix of multiple modes of transport to reduce the risk of route predictability and choke points. Micro convoys of one to three vehicles will transport large parts and fuel, while autonomous mules trekking over the countryside will carry secure saddlebags of food and ammunition. These movements will be complemented by air fleets of quad-copters carrying urgent repair parts. This network of automated logistics will be orchestrated to arrive within a precise window at the logistics release point.

While the U.S. is slowly exploring AVs, some adversaries are already using drones to achieve strategic results. Examples of this are China's enduring presence on small remote outposts in the Himalayas and islands in the South China Sea. In these instances, resupply is conducted via drone on a routine or emergency basis and supports a strategic objective: maintaining an enduring presence in a sensitive location.

The principles of sustainment have served logisticians well throughout their history. However, they must adapt to the introduction of AVs to remain relevant in the next conflict. There are prudent steps the Army could take today that will set the conditions for incorporating AVs in the future–the first of which is educating the force on developing these new capabilities. Incorporating Army Futures Command emerging technology briefs into professional military education courses is one simple step to educating the force on any new developments, not simply AVs. A second step is incorporating the offensive and defensive impacts AVs will have on future conflicts into current military plans. By proactively incorporating AV guidance and implications into fundamental planning documents like the National Military Strategy, the Army and the joint force can better posture themselves for the future. The next great revolution of warfare is autonomous vehicles, and the side that embraces this technology first will have the upper hand.

Maj. Brian Mathews is a Joint Chiefs of Staff intern serving on the Army Staff in the Deputy Chief of Staff for Installations, G-9. He holds dual Bachelor of Science degrees in Economics and Supply Chain Management from the Pennsylvania State University and a Master of Policy Management from Georgetown University.

Feature Photo
An unmanned forklift moves cargo Aug. 28, 2019, around North Forward Operating Base, Camp Grayling, Michigan. (Photo by Jerome Aliotta)

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DEPARTMENT OF THE ARMY
ARMY SUSTAINMENT
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2401 QUARTERS ROAD
FORT LEE VIRGINIA 23801-1705

Official Business

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