Enabling Logistics in Contested Environments

Resilient, Distributed, and Predictive

■ *By LTG Robert M. Collins*

The Army operates in complex operational environments and faces unprecedented challenges that create adversity for sustainment capabilities. Evolving threats, contested logistics, and the tyranny of distance require innovative approaches to ensure we remain ready, resilient, and adaptable. This demands not only the seamless execution of logistics, but also the ability to anticipate and preempt sustainment challenges through advanced predictive logistic enablers. By leveraging data and analytics, predictive logistics enables the Army to anticipate sustainment needs and address them proactively, supported by a robust, data-enabled supply chain.

Central to this transformation are three key initiatives: supply chain risk management (SCRM), item unique identification (IUID), and the Regional Sustainment Framework (RSF). These initiatives address critical sustainment needs across the life cycle and enable predictive logistics by creating a data-driven ecosystem. These efforts ensure resources are available when and where they are needed. These frameworks provide a foundation and are actively being developed and integrated into the Army's day-to-day operations. The framework is continuously refined and adapted to remain relevant based on evolutions in threat, technology, and operational realities.

The Army collaborates across a spectrum of professionals within the acquisition, sustainment, intelligence, and defense industrial base communities to align sustainment strategies with operational realities. The Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology; Program Executive

Offices; and program managers collaborate with logisticians and other key stakeholders to implement policies and strategies that ensure capabilities are effectively delivered to the warfighter and address their unique challenges in the field.

Predictive logistics forms the backbone of this effort by using advanced analytics, machine learning, and artificial intelligence. These technologies enable the Army to forecast maintenance needs, anticipate supply chain disruptions, and allocate resources proactively. This shift from reactive to proactive sustainment is critical for maintaining operational tempo in contested environments where traditional logistics models may falter.

For example, during a high-tempo operation in the U.S. Indo-Pacific Command (USINDOPACOM) theater, predictive models were used to analyze operational data from deployed systems. These models identified components at high risk of failure, enabling sustainers to prioritize their maintenance and replacement. By addressing these issues preemptively, commanders avoided costly delays and ensured the availability of mission-critical equipment.

SCRM

SCRM supports these efforts by playing an early and preemptive role in addressing vulnerabilities inherent in the current, vast, and interconnected supply chain. SCRM spans the entire life cycle of Army systems, from initial production through packaging, handling, storage, transportation, and operational use. Global supply chains offer efficiencies that also expose the Army to risks, such as reliance on adversarial sources, counterfeit components, and disruptions. The Army's comprehensive SCRM approach emphasizes early risk identification, diversification of supply sources, and collaboration with allies and industry partners. SCRM promises to mitigate risks and enhance supply chain resilience by incorporating proactive measures at every stage in the life cycle.

For instance, data-informed logistics enables the SCRM framework and aids in the identification and mitigation of bottlenecks and vulnerabilities. During high-tempo operations, predictive tools alert sustainers to potential shortages of critical components, enabling timely corrective actions. The war in Ukraine has underscored the importance of having strong, reliable supply chains. The Army's approach to SCRM has already shaped key investment choices, like the $69 million allocated in fiscal year 2024 to boost domestic production of boron carbide. This effort helps guarantee a steady supply of advanced body armor, cutting down dependence on foreign sources and reducing the risk of supply disruptions caused by adversaries. Similarly, SCRM analysis informed expanded domestic production of 5000-series aluminum ingots, directly benefiting programs such as the M10 Booker and the Armored Multi-Purpose Vehicle.

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IUID

IUID complements the increasingly secure supply chain by ensuring precise tracking of individual assets throughout the life cycle. As a globally unique identifier, IUID provides visibility into the location, condition, and usage of equipment. While the tags themselves may not measure condition directly, the data systems with which they integrate can aggregate maintenance records and usage patterns to inform sustainment decisions. For example, in the USINDOPACOM region, IUID data revealed recurring issues with specific vehicle components. Identifying these patterns allowed sustainers to prioritize repairs and prevent failures, ensuring mission-critical equipment remained operational.

Beyond its role in predictive logistics, IUID enhances transparency to support the Army's accountability and readiness so that assets are accurately recorded as ready for prioritization and distribution. Additionally, IUID integrates with systems like the Global Force Management Data Initiative, improving resource allocation and decision making across the sustainment enterprise.

RSF

The RSF builds on the foundations laid by SCRM and IUID and represents a strategic shift in sustainment operations. Recognizing that traditional, centralized logistics models are vulnerable to disruption, the RSF decentralizes sustainment and brings maintenance, repair, and overhaul (MRO) capabilities closer to the warfighter. This framework leverages partnerships with allies, regional facilities, and industrial bases to create a distributed network of sustainment capabilities. These include region-specific solutions, such as watercraft sustainment, that reduce reliance on retrograde operations and minimize repair times.

RSF supports forward-deployed sustainment by positioning resources closer to operational theaters. The RSF leverages advanced data analytics and enhances readiness by ensuring resources are available when and where they are needed.

For example, pilot programs are validating the RSF's capabilities in contested environments such as USINDOPACOM. These pilots demonstrate how decentralized MRO capabilities, combined with predictive logistics, minimize downtime and enhance operational tempo. This integration also informs policy development and implementation, ensuring the success of the RSF.

Together, SCRM, IUID, and RSF strengthen a more cohesive strategy for addressing the sustainment challenges of modern conflict. These initiatives are part of a broader vision to create a data-enabled, resilient supply chain that anticipates and responds to the needs of the warfighter. By embedding advanced technology, data-driven insights, strong partnerships, and collaborative approaches into its sustainment strategy, the Army ensures its ability to maintain operational effectiveness, preserve strategic advantage, and meet the demands of contested logistics in modern warfare.

LTG Robert M. Collins currently serves as the Principal Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics and Technology) and as the Director of the Army Acquisition Corps. He commissioned as an Armor officer through the Shippensburg University ROTC program in 1992. He previously served as Army's Product Manager for Warfighter Information Network-Tactical; Army's Project Manager for Distributed Common Ground System-Army; assistant to the Program Executive Officer for Intelligence, Electronic Warfare and Sensors (PEO IEW&S) and later as the PEO IEW&S; Program Executive Officer for Command, Control, Communications-Tactical; and Deputy for Acquisition and Systems Management. He has a Master of Arts degree in computer resources and information management, a Master of Science degree in human relations, and a Master of Science degree in national resource strategy. He is a graduate of the Eisenhower School of Strategic Studies, Combined Arms Services Staff School, Command and General Staff College, the Armor Officer Basic Course, Signal Advanced Course, and Systems Automation Course.