MODERNIZING THE TACTICAL NETWORK: CAPABILITY SETS

To achieve all−domain dominance, keep pace with industry advancements and deliver a modernized tactical network, the Army is fielding Capability Sets (CS) in two year increments starting in FY2021. Each CS builds off of the previous and is infused with commercial solutions informed by Soldier−led experimentation. The CS construct leverages Army and Defense science and technology, coupled with industry and academia's research and development advancements and commercial off−the−shelf solutions. Building to standard with advanced waveforms, mission command applications, cyber security, data management, satellite communications and artificial intelligence are core to the success of this phased approach.

The Army embraces the developmental operations (DevOps) model of experimentation, demonstration, and direct feedback from operational units to inform the fielding of each successive CS. These experiments focus beyond today's current network baseline, on enhanced capability to enable the Army to make informed network design decisions and capability tradeoffs. This approach introduces changes to the tactical network design through continuous assessments of integrated capabilities along four major lines of effort (unified network, common operating environment, joint/coalition interoperability, command post mobility and survivability), speeds the development and approval of requirements, focuses on open architecture and standards to enable industry innovation and puts in place modernization activities aligned to funded programs.

To deliver the network of 2028, the Army outlined four capability sets in Fiscal Years 2021, 2023, 2025, and 2027 to insert technologies that provide warfighters improved capabilities and dominance in a contested and congested environment against a peer or near−peer adversary. Tech insertions will continue beyond 2027 following this same iterative approach.

"THIS IS AN ITERATIVE BUILD TO THE END STATE. WE NEVER TRULY REACH THE END STATE; THE END STATE IS CONSTANT INNOVATION."

- GEN Murray, Commanding General, Army Futures Command

CAPABILITY SET 21
EXPEDITIONARY & INTUITIVE

CS21,fielding to four Infantry Brigade Combat Teams in FY21 and an additional 5 priority units in FY22, improves expeditionary capability and makes the network simple and more intuitive. Communications systems are smaller, lighter and faster. Soldiers find that applications and network devices are easier to learn and use and commanders of infantry formations are provided more connectivity options to ensure they can communicate in any environment.

CS 21 DELIVERS:

• Integrated Tactical Network (ITN) fielded to select Infantry BCTs

• Initial fielding of the common operating environment through command post computing environment and across handheld and mounted environments

• Enhanced SATCOM capability for Expeditionary Signal Battalion–Enhanced units

• Software update for resilient satellite communication over existing terminals

• Initial on site cloud (edge) agile computing environment that provides distributed mission command

• Foundation for command posted mobility and survivability improvements

• Improved tactical network transport to prepare for IVAS integration (supports Soldier Lethality and Synthetic Training Environment CFTs)

CAPABILITY SET 23

CAPACITY, RESILIENCY & CONVERGENCE

CS 23 builds upon advances in expeditionary capabilities and intuitiveness to increase capacity, resiliency and convergence of the network. CS23 will increase bandwidth to support sensor data, graphics and video and will establish additional communication routes through satellites to provide multiple transport paths, improving resiliency. Fielding of the Integrated Tactical Network (ITN) to mounted formations will extend the distance and range of units thereby increasing mobility for maneuver. Units at the edge will have more agile computing environments because of access to a tactical cloud. Mesh networking and hardening of radios and other systems decreases vulnerabilities and susceptibility to jamming. Converged mission command applications, integrated intelligence data and an enhanced common operating picture ensure usable information supports warfighter decision−making, underpinned by timely and accurate data. This capability set helps to provide a more robust transport layer to support the requirements of the Army's other modernization priorities.

CS23 INCLUDES:

- Initial commercial low−earth and mid−earth orbit (LEO/MEO) at−the−halt providing high capability communications
- Continued ITN fielding to Infantry and Stryker BCTs; field tailored ITN for mounted BCTs that optimizes capabilities to meet operational distance and pace, improved aerial tier, and expanded network operations between tactical and enterprise
- Introduction of C4ISR/Electronic Warfare Modular Open Suite of Standards (CMOSS) a modular open systems architecture (MOSA) that will converge select Army warfighting capabilities
- Introduction of hardened radio capabilities including mesh network into all formations and improvements in anti−jamming for waveforms (including SINCGARS)
- Convergence of mission command applications (Fires, Intel, Sustainment) to set conditions for Joint− All Domain Operations
- Thickening the transport layer to provide additional artificial intelligence and beyond line of sight for manned/unmanned vehicles, fires, missiles and small aircraft (supports Next Generation Combat Vehicles, Long Range Precision Fires, Air Missile Defense, and Future Vertical Lift CFTs)

In FY20, the Army began prototyping and experimenting with technologies and capabilities that will be considered in the Capability Set 23 network design. These prototyping efforts will inform preliminary designs and, where viable, will be inserted into events and exercises for larger scale experimentation for further assessment.

CAPABILITY SET 25
AUTOMATED & PROTECTED

Through experimentation and DevOps, the Army will continue to leverage and insert commercial solutions into its network with a focus on automation and protection. Deployed units will have more robust cloud capability, network management and decision making tools will become more automated, and network security will be exponentially amplified due to new waveforms. Advanced cellular technology such as 5G, commonplace in the commercial sector, will become accessible to formations resulting in faster connectivity. Data networking capability between ground forces and aviation will provide advanced air–ground communications.

CAPABILITY SET 25 PROVIDES:

- Continued ITN fielding
- Introduction of radio and satellite communication waveforms to increase electronic warfare resiliency, rand, scale and bandwidth
- Potential integration of 5G (or equivalent) commercial network capacity
- Initial commercial LEO/MEO on–the–move providing high capacity communications
- Integration/interoperability of air–ground communications capability
- High tempo data driven decision tools to increase cyber threat visibility
- Hardened command post improvements and reduction of footprint
- Initial integration of network with future mid–size transport assets (supports Future Vertical Lift CFT)

CAPABILITY SET 27
MULTI–DOMAIN DOMINANCE

The Army's insertion of commercial technologies in two year phases will be fully institutionalized. Wireless connectivity will be more secure (hardened) and the Army's network will have significant cyber improvements and protection. Automation capabilities inserted in earlier capability sets will now have artificial intelligence baked in and will be machine learning enabled. Command post and unit footprint will be less visible. Full and seamless integration of all applications and systems across different units improve interoperability, information sharing, and accelerated decision making.

CAPABILITY SET 27 ADVANCES:

- Non–traditional waveforms that are spectrum efficient, have higher bandwidth, anti–jamming and low probability of detection
- Integrated artificial intelligence and machine learning capabilities and tools to enhance decision making
- Hardened 5G or equivalent
- Dispersed mission command computing in command posts in disadvantaged environments
- Converge all warfighting function applications into COE

Our Army is implementing these modernization efforts through capability sets to drive towards a less–complex tactical network in 2028 that utilizes the full benefits of existing technology and ensures Soldiers of today and future generations continue to be the most lethal fighting force in the world.