



World-Class Technology, According to Plan

Information-gathering drones swarm the air as unmanned Army vehicles push just ahead of infantry soldiers into a mega-city overflowing with people, vehicles and high-rise buildings. Army cyber warriors fight a silent battle for the city's internet of things while an unmanned warship shoots down an aircraft, which explodes in the air, creating a massive fireball and a barrage of fragments that plummet to the ground. Meanwhile, the first artillery crew to the battle is trading targeting and friendly forces information with Air Force bombers and Navy gunners.

The technologies in this future multi-domain battle scenario may seem far-fetched, but the Army's primary science and technology arm, the U.S. Army Research, Development and Engineering Command (RDECOM), is developing many of them now. As the link between Army readiness today and for the future force, RDECOM is overhauling how it does the business of science and technology (S&T) to posture itself to make a reality of the six modernization priorities listed by Acting Secretary of the Army Ryan McCarthy and Army Chief of Staff Gen. Mark Milley: long-range precision fires, Future Vertical Lift (FVL), the Next-Generation Combat Vehicle (NGCV), air and missile defense, the network and soldier lethality.

"The range of threats the nation faces has prompted the Army chief of staff to mandate a change to the way the Army modernizes its forces," RDECOM Commanding General Maj. Gen. Cedric Wins said. "That means RDECOM will have to change the way we do business to support a new focus. Our Campaign Plan is the roadmap to do that."

The goal of the plan's four lines of effort is to focus the 24,000-strong command more tightly on the capabilities McCarthy and Milley have made their top priorities while maintaining the balance it needs to make the new discoveries and develop the new technologies that will become the capabilities the future force needs to maintain dominance. The lines of effort are: integrated technology development and engineering services; talent management and infrastructure; business process and resource optimization; and strategic communications.

Leveraging the Campaign Plan, RDECOM - a major subordinate command of the U.S. Army Materiel Command

- is optimizing its resources and collaborating across the Army community and with industry, academia and international partners to inform science and technology (S&T) requirements and execute research and technology that will deliver required capabilities for soldiers. RDECOM also works closely with its fellow Army S&T partners, the U.S. Army Space and Missile Defense Command, U.S. Army Medical Research and Materiel Command and the U.S. Army Engineer Research and Development Center to round out its portfolio.

Integrated Development

The integrated technology development and engineering services line of effort is intended to focus the command on identifying and inserting the right research and technology to fill gaps in current and future capabilities, as well as synchronizing RDECOM's major S&T efforts with the chief of staff's six modernization priorities. A number of RDECOM's efforts that currently link directly to the Army's priorities include robotics, artificial intelligence and autonomy. These technologies will enable the NGCV and FVL to perform both manned and unmanned operations, which will be required for the joint force in future air and ground domains. RDECOM also continues to develop technologies that provide assured position, navigation and timing and cyber and electronic warfare, critical components for both long-range precision fires and the network.

Integration across its six research, development and engineering centers (RDECs) and the U.S. Army Research Laboratory (ARL) is an important component of this line of effort.

For example, plans for FVL will leverage multiple areas of expertise within RDECOM, including engineers who can produce technology that allows platforms to perform complex navigation and a communication system that will operate in Anti-Axis Aerial Denial (A2AD) environments. Because of anticipated future threats, FVL platforms will also need active protection systems for maneuver and enhanced weapon systems for lethality. As stand-alone efforts, these systems are impressive, but maintaining the dominance the Army needs requires a fully integrated suite of capabilities that allow the soldier to focus on the mission, not switching back and forth between technologies.



A Stryker vehicle commander interacts in real time with a soldier avatar that is participating remotely from a collective trainer. The U.S. Army Research Laboratory, University of Southern California Institute for Creative Technologies, Combined Arms Center-Training and Program Executive Office for Simulation, Training and Instrumentation are developing the Synthetic Training Environment, which will link augmented reality with live training. (Photo Credit: U.S. Army)

“Integration is one of RDECOM’s charter missions for a reason,” Wins said. “Recent modernization efforts focused on adding new capabilities to existing platforms. That allows soldiers to regain lost capabilities, but not being fully integrated imposes a cognitive load on the soldier. Multi-domain battle will only add to that. We need to take a cue from industry. They’re proving every day that when you integrate technologies - in their case the phone, the tablet, the computer, the TV, the cloud, etc. - you give the end user capabilities beyond what each technology can offer.”

RDECOM plans to conduct technology demonstrations in 2018 that showcase robotics and autonomy, as well as efforts involving precision fires and network Command, Control, Communications and Intelligence. Also planned for FY18 is Cyber Quest, the annual competition conducted by the U.S. Army Cyber Center of Excellence’s Cyberspace Battle Lab, which will demonstrate cyberspace electromagnetic effects technologies being developed by the U.S. Army Communications-Electronics Research, Development and Engineering Center.

Exercises in the Pacific theater that will start this spring and continue through FY19 will allow the new Multi-Domain Battle Task Force (MDTF) pilot program to evaluate specific technologies, including long range precision fires, precision navigation and timing, Intel, electronic warfare and cyberspace and additive manufacturing sustainment and logistics support. The MDTF was established to determine the requirements for a new military formation that will address the warfighting capability required in an A2AD environment.

While the goal of these demonstrations is often an early assessment of how to apply the technology for military

use, RDECOM works closely with the U.S. Army Training and Doctrine Command’s (TRADOC) Army Capabilities Integration Center to inform the requirements. TRADOC uses a “campaign of learning” approach to determine the doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy implications of the capability. As technologies mature and transition into a program of record, the program manager uses the data from the demonstrations to chart a path for fielding the equipment and providing capability to the warfighter.

The right mix of people

The human capital team within the talent management and infrastructure line of effort is responsible for maintaining the right mix within RDECOM’s global workforce of almost 24,000 civilians, military personnel and contractors, including nearly 10,000 scientists and engineers. The human capital team is ramping up its efforts to attract and hire the next generation of technology leaders by visiting colleges and universities and holding conferences to recruit students interested in careers in science or engineering.

“Recruiting is an ongoing effort within RDECOM because scientific breakthroughs create new opportunities to advance the state of the art, which means having scientists and engineers at the forefront of their fields is essential,” Wins said. “RDECOM also teams with academia and industry, but having the right people within the command is key to bringing new capabilities to the force.”

To reach the right mix of people, the human capital team created a centralized process to determine which recruiting events the command should attend, as well as metrics for measuring the return on investment from those events.