

Army Modernization in Next-Generation Vehicles Will Change the Battlefield

by MAJ Cory W. Wallace, MAJ George M. Morris, MAJ Scott Stephens and MAJ Shawn D. Pardee

The Army must maintain combat-vehicle overmatch in close combat against current threats while taking necessary actions to ensure overmatch through 2050 and beyond. Therefore the Next-Generation Combat Vehicle (NGCV) cross-functional team (CFT) is the Army's No. 2 modernization priority. Established in 2017 by then-Secretary of the Army Mark Esper and Chief of Staff of the Army GEN Mark Milley, the NGCV CFT drives combat-vehicle modernization priorities to rapidly provide Soldiers with the most advanced combat platforms.

Our peer threats have studied our equipment and tactics. They have developed increasingly capable systems and armaments that include, but are not limited to, advanced kinetic-energy ammunition, improved anti-tank guided missiles, explosively formed penetrators, underbelly-mines rocket-propelled grenades, loitering munitions, unmanned aerial systems and cyber-electromagnetic activities.

To meet these threats, the NGCV CFT prioritizes the Army Science and Technology efforts for ground-combat vehicles and works with its acquisition partner to field the Armored Multipurpose Vehicle (AMPV), mobile protected firepower (MPF), Optionally Manned Fighting Vehicle (OMFV) and Robotic Combat Vehicles (RCV). The CFT is also assessing the need for a main-battle-tank replacement and is working on cutting-edge technologies in automation, artificial intelligence and machine learning. Overall, the CFT synchronizes, coordinates and resources government science and technology projects, analytics, academic and industry developments; Soldier assessments and experiments with prototypes; and acquisition efforts to speed the development of the next generation of combat vehicles for our Soldiers.

As BG Ross Coffman, director of the NGCV CFT, consistently reminds our modernization partners within the Defense Department and industry that "we cannot modernize to parity. We must modernize to overmatch our enemy."

NGCV portfolio

AMPV: Is a one-for-one replacement for the M113 at the unit level of armored brigade combat team (ABCT) and below. AMPV will be able to match the pace of an ABCT, have improved survivability and force protection over the M113, and be able to incorporate future technologies and the Army's future network. These capabilities will allow units to operate more securely and efficiently with the tanks, infantry fighting vehicles and self-propelled artillery pieces of the ABCT.

When fielded, AMPV variants will replace more than 30 percent of the ABCT's aging tracked-vehicle fleet. The mission-command vehicle facilitates enhanced command-and-control for commanders and staff. The mortar carrier provides immediate, responsive fire support to the BCT to conduct fast-paced offensive operations. The medical-evacuation vehicle provides the maneuver units and the brigade-support battalion the ability to transport casualties with en-route care for four litter or six ambulatory casualties. The medical-treatment vehicle provides a workspace for the surgeon or physician's assistant to care for Soldiers. The general-purpose vehicle supports logistics and non-standard medical evacuation at the company level.

The first units within an ABCT will receive AMPVs beginning in Fiscal Year (FY) 2022.



Figure 1. Soldiers from 4th “Dark Horse” Squadron, 9th U.S. Cavalry Regiment, 2nd Armored Brigade Combat Team, 1st Cavalry Division, complete field testing of the AMPV at Fort Hood, TX. (U.S. Army photo)



Figure 2. General-purpose and medical-evacuation-vehicle variants of the AMPV.

MPF: In 2013, 82nd Airborne Division submitted an operational-needs statement identifying an urgent, operational, warfighting need for an MPF capability for conducting Joint forcible entry. To meet this requirement and support infantry BCTs (IBCTs), the Army will field the MPF, a light tank that provides precise, large-caliber, long-range direct fires for IBCTs. The MPF will boast a 105mm main-weapon system, 7.62mm coax, commander weapon station and a roll-on/roll-off, C-17-transportable capability. The MPF will neutralize enemy prepared positions, heavy machineguns and lightly armored vehicles.

The first IBCT to be equipped will be in FY 2026.

Integrating an armored vehicle into the IBCT will require adjustment to the current doctrine, organization, training, materiel, leader development, personnel, facilities and policy (DOTMLPF-P) domains. To understand the DOTMLPF-P implications, XVIII Airborne Corps completed two exercises using U.S. Marine Corps Light Armored Vehicles as MPF surrogates. In FY21, XVIII Airborne Corps will execute a Soldier vehicle assessment and limited user test of MPF prototype vehicles. Both events will have two MPF platoons, each composed of a vendor-specific prototype set of vehicles. These Soldier-focused events will include new-equipment training, gunnery and field exercises to provide further refinements to DOTMLPF-P insights and the Army's decision on which vendor-prototype vehicle the Army will select for production in FY22.

OMFV: As part of an ABCT, OMFV will replace the Bradley Fighting Vehicle (BFV) to provide the capabilities required to defeat a future peer competitor's force. The Army is seeking a transformational increase in warfighting capability, not simply another incremental improvement over the current BFV. Like the Bradley, the OMFV will fight as part of a combined-arms team but will support cross-domain maneuver and readily defeat pacing threats while maneuvering Soldiers to their tactical objectives. The OMFV will be loaded with advanced sensors and mission-command capabilities for the vehicle crew and dismounted Soldiers.

To generate a more transformational approach, the Army is asking traditional and non-traditional industry partners to participate in a series of digital design reviews and selections before the Army settles on up to three vendors to develop prototype vehicles for Soldier evaluation and testing. This revolutionary approach will allow greater innovation and competition in developing a fighting vehicle.

The Army plans to equip its first units with OMFV in FY28.



Figure 3. OMFV, right, illustrated in use on the battlefield.

RCV: Has two fundamental purposes: deliver decisive lethality on future battlefields and offload the risk associated with extremely dangerous missions from Soldiers to unmanned platforms. RCVs will expand the geometry of the battlefield, rapidly develop a common operating picture and enable commanders to employ external assets before first contact with Soldiers. Instead of a Soldier, RCVs will also enable commanders to place robots in the most dangerous locations of the future battlefield to take on complex breaches, long-duration operations and subterranean space in dense urban environments.

The RCV suite includes three variants: light, medium and heavy. The RCV (L) supports a robust sensor array to enable reconnaissance-focused missions, while the RCV (M) provides a medium-caliber weapon system and anti-tank guided missiles to augment a unit's organic direct-firepower capability. These variants can support modular mission payloads such as electronic warfare, counter-unmanned aerial systems and smoke obscuration. The RCV

(H) vehicle fights as a decisive-lethality wingman that maneuvers in tandem with its manned-vehicle counterparts or as part of a robotic platoon to destroy all threat targets with its onboard weapon systems.



Figure 4. RCV (L), left, and RCV (H), right.

All RCVs variants must keep pace with their organic units during both movement and maneuver, thus requiring robust semi-autonomous capability and aggressive mobility characteristics. All three variants have the potential of integrating into multiple, if not all, types of BCTs within the Army's force structure.

To develop RCVs, the NGCV CFT and Combat Capabilities Development Center's Ground-Vehicle Systems Center (GVSC) have conducted multiple live and virtual experiments with Soldiers. GVSC is leading a virtual experimentation effort focused on deriving feedback on proposed capabilities and operating concepts at the company and platoon levels. The CFT is working with the Maneuver Battle Lab at Fort Benning, GA, to conduct more experiments with Soldiers to understand the RCV's DOTMLPF-P impact at the battalion level and above. These experiments collect Soldier feedback and influence vehicle requirements, thus creating a platform "designed by the Soldier for the Soldier."

The NGCV CFT's three-phased RCV experiment will lead to an Army-level decisions in FY22 and FY23 to field RCVs to the operational force, starting around FY28.



Figure 5. Experiments are collecting Soldier feedback and influencing vehicle requirements.

Conclusion

The NGCV CFT is developing both modern, replacement combat vehicles and transformation capabilities for the close fight to support multidomain operations against our peer threats. The CFT is committed to Soldier-centered design for developing system and component technologies. The officers and noncommissioned officers of the CFT were selected from – and at the completion of their tour will return to – the operational force, so they understand the challenges platoons and brigades face every day.

The CFT is making a difference and speeding delivery of these ground combat vehicles to the operational force. If you would like to contribute your ideas, contact us at the following address: usarmy.detroit.ccdc-gvsc.mbx.ngcv-cft@mail.mil.

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Acronym Quick-Scan

ABCT – armored brigade combat team

AMPV – Armored Multipurpose Vehicle

BCT – brigade combat team

BFV – Bradley Fighting Vehicle

CFT – cross-functional team

CLC – Cavalry Leader's Course

DOTMLPF-P – doctrine, organization, training, materiel, leader development, personnel, facilities and policy

FY – fiscal year

GVSC – Ground-Vehicle Systems Center

HHBN – Headquarters and Headquarters Battalion

IBCT – infantry brigade combat team

MCCC – Maneuver Captain's Career Course

MPF – mobile protected firepower

MSM – Meritorious Service Medal

NGCV – Next-Generation Combat Vehicle

OLC – oak-leaf cluster

OMFV – Optionally Manned Fighting Vehicle

RCV – Robotic Combat Vehicle



Figure 6. 1st Cavalry Division Soldiers participate in an NGCV experiment.



Figure 7. A Soldier puts an RCV through its paces during an experiment.