

ARMY PROGRAMS

Future Combat System (FCS)

Future Combat Systems (FCS) is a family of advanced, networked air and ground maneuver, maneuver support, and maneuver sustainment systems that will include manned and unmanned platforms. They will replace virtually every combat vehicle in the Army inventory, including main battle tanks, infantry fighting vehicles, howitzers, and mortars. This program is distinct from the Stryker family of medium weight wheeled vehicles intended to be an interim force of six brigades, while the FCS force is to be the Objective Force and to equip the entire Army (less the airborne division). A major component will be the addition of three unmanned ground robotic vehicles (one armed with a missile, one for utility/logistics, and one man-packable) and four unmanned aerial vehicles. A new vertically launched missile for indirect fire support is also part of the FCS program. FCS will be networked via a C4ISR architecture that includes network communications, network operations, sensors, battle command system, and manned/unmanned reconnaissance and surveillance capabilities that enable situational understanding and synchronized operations. The network is known as Warfighter Information Network-Tactical and includes the Joint Tactical Radio System. It will create, send, and receive position location reports and command and control message traffic to enable the FCS vehicles to display a frequently updated common operational picture and to rapidly pass orders, overlays, and messages to and from each vehicle and command post.

FCS is intended to be the core building block of the Army's Objective Force. The Objective Force will consist of FCS battalions organized into Units of Action, which in turn will be organized into Units of Employment. The FCS unit is not intended to be a special purpose force. It is intended to accomplish all Army missions, including close combat, stand-off fires with precision weapons, urban combat, and operations in all terrain and environments.

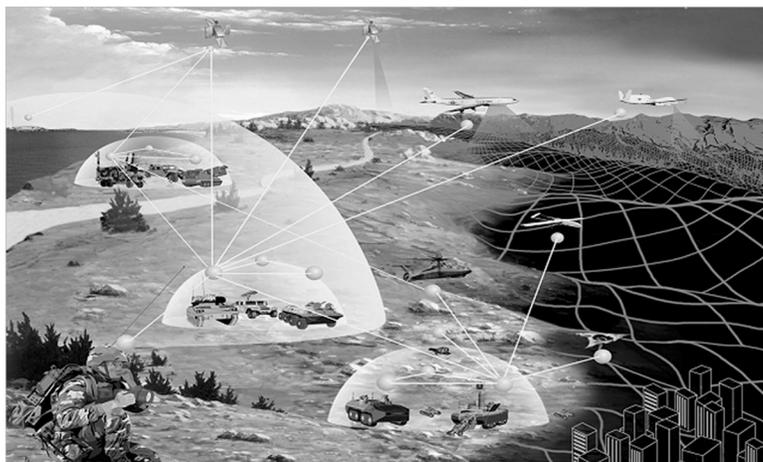
The goal of the program is to significantly improve the deployability of the Army without sacrificing any of the current lethality or survivability and to ensure a deployable, responsive, lethal, agile, versatile, survivable, and sustainable land force. The maximum vehicle weight is intended to be between 16 and 20 tons and all variants are to be C-130 transportable.

The FCS system will require completion of a Live Fire Test and Evaluation (LFT&E) program before the full-rate production decision, now planned for mid-FY11. LFT&E will include both munitions effectiveness for the new direct and indirect fire munitions and susceptibility and vulnerability testing on the new manned and robotic vehicles being developed. Of special interest is the survivability of the crews of the manned vehicles.

Several FCS platforms will be equipped with weapons requiring newly developed munitions, none of which are to be developed and acquired by the FCS program. Instead, each required munition – for example, the Precision Attack Missile for the NetFires platform – will be developed separately by non-FCS program offices, which will be responsible for resourcing and conducting individual lethality Live Fire programs for each munition.

TEST & EVALUATION ACTIVITIES

The Test and Evaluation Master Plan (TEMP) is being prepared for submission to DOT&E in March 2003 to support the Milestone B date of



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May 2003. There will be several Limited User Tests at different echelons of command leading up to an Initial Operational Test and Evaluation during FY10.

TEST & EVALUATION ASSESSMENT

The key areas of technical risk for the program lie in the areas of ground robotic vehicles, survivability, mobility, and situational awareness and interoperability. The requirement for semi-autonomous operation of ground robots is a source of high technological risk. The development of a 155mm howitzer on a wheeled chassis weighing between 16 and 20 tons will also be a technological challenge, especially in meeting the requirement to carry 3-7 days of ammunition. The vehicles of the FCS force are intended to have the same level of survivability as the 70-ton legacy force, but within the weight structure of a 16-20 ton vehicle. Survivability will depend upon quantum leap improvements in both passive and active armor protection. FCS forces will require improved situational awareness and detection avoidance to survive but are then increasingly vulnerable to electronic warfare, mines, and attack from close-in infantry with rocket-propelled grenades. The mobility of the FCS vehicles is intended to be supplied by hybrid vehicle propulsion systems, which require development of power supplies, electronic switching technology, and fuel sources. The entire FCS concept rests upon a network of sensors, platforms, and command nodes linked by reliable, high bandwidth, and high-speed communications. Such capabilities do not yet exist and will entail significant risk in their development.

There is also considerable operational risk in the FCS program due to the changes in the concept of operations. For example, employing an artillery concept of detachable and remotely operated rockets fired from a container entails operational risk in the tactical availability of the munitions when left unattended. The reliance of the FCS force on precisely-delivered fires (especially those from joint platforms), delivered on time and in quantity to the ground force commander, depends heavily on the bandwidth in the communications network that supports it, the accuracy of the sensors that locate the targets, and the availability and timeliness of the joint munitions and platforms to support. Competition for fires will also introduce an element of risk, since in many cases the fire support platforms will not be organic to the FCS-equipped force. The FCS concept entails the creation of new Army units, under different organization than the current Army, which have to be created, manned, and trained in order to capitalize on the technological capabilities of FCS. This will entail significant operational risk as tactics and techniques have to be developed and refined in concert with the technical capabilities development.

It is highly unlikely that the current schedule for FCS development can be maintained to field threshold levels of mission performance due to the high levels of technological and operational risk. The FCS Block I development schedule calls for a series of limited user tests in FY04, yet the government asked industry to prepare proposals in April 2002, and there are currently no vehicles, test beds, prototypes, or even mature operational concepts to test. The FCS concept depends upon multiple vehicles being developed simultaneously (including unmanned robotic vehicles) and calls for a new unit organization, trained under an operational concept as yet unclear. It is extremely high risk to develop a family of highly complex vehicles and the sophisticated command and control network simultaneously under the existing schedule, and to organize, train, test, and equip a mission-capable FCS before 2010.