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Army Future Vertical Lift (FVL) Program

The major combat rotorcraft platforms in U.S. inventory—the Chinook, Black Hawk, Apache, and Kiowa Warrior—are based on designs from the 1960s and 1970s. While several are still in production or remanufacture, the Army is leading DOD’s effort to move to a new generation of rotorcraft technology.

The Future Vertical Lift (FVL) program is a research and development effort dedicated to discovering, investigating, and refining the technologies that is to provide the next generation of vertical lift aircraft for the United States armed forces. According to the Army, the goal of the program is to develop technologies that improve “maneuverability, range, speed, payload, survivability, reliability, and reduced logistical footprint” compared with current rotorcraft.

The Army lists FVL as one of its top six modernization priorities. The Marine Corps and Navy also plan to use FVL-derived technology in their next-generation rotorcraft. Although the FVL effort is intended to benefit all services, and elements of the work are joint, the Army is the lead service, and most funding for the program is included in the Army’s R&D budget.

FVL is in a fairly early stage, and aircraft likely to result from this program’s work are not expected to be operational until the early 2030s. However, in April 2018, then-Army Secretary Mark Esper directed the FVL team to determine whether promising technologies could be incorporated into a new aircraft within 10 years.

History

FVL officially began in 2009, and the strategic plan for the project was issued in October 2011. The pace of work has varied over time due to shifting Army budget priorities. For example, the FY2018 Army budget submission projected that the FVL technology development phase would begin in the second quarter of FY2019, but the FY2020 budget documents now put that goal in the third quarter of FY2021.

The Army is also resolving an internal debate as to its priorities. While the FVL development focus had been on the medium-lift Black Hawk helicopter replacement, Army officials have more recently noted a larger capability gap in the attack/reconnaissance fleet, and are considering whether to shift focus to that smaller platform. The FY2020 budget submission did not resolve that debate; the lengthened timelines for the program may indicate an interest in leaving options open.

FVL is currently looking at five basic categories (or “capability sets”) of aircraft varying in size, but the initial

foci are a medium transport platform capable of succeeding the Army UH-60 Black Hawk and Marine H-1 “Huey” utility helicopters—the Future Long-Range Assault Aircraft (FLRAA)—and a scout platform roughly in the role of the current Apache, now called the Future Attack and Reconnaissance Aircraft (FARA). Heavy-lift variants may follow.

FLRAA

Bell and Sikorsky (with Boeing) have produced demonstrators for FLRAA. The two companies are taking different technology approaches to their efforts. The Bell V-280 is a tiltrotor aircraft like the V-22 Osprey, with engines and rotors at the end of its wings that swivel. The Sikorsky/Boeing SB-1 is a compound helicopter, using twin coaxial rotors to provide lift and a pusher propeller to enhance speed.

Figure 1. FLRAA Schedule

Events	Start	
	Quarter	Year
Analysis of Alternatives	3	2017
Weapons System Specification Development	2	2019
Milestone A Documentation and Contracts Requirements Package	2	2019
Projected Milestone A	4	2021
Request for Proposal Release	1	2022
Proposal Preparation	1	2022
Source Selection Evaluation Board	2	2022
Technology Maturation and Risk Reduction Contract Award	2	2023

Source: FY2020 budget submission for Research, Development, Test & Evaluation, Army.

The next major FLRAA milestones are a projected Milestone A decision in FY2021 to proceed with development and a follow-on request for proposals for risk reduction (the main step from technology demonstrators to competitive aircraft) in FY2022.

Figure 2. Bell V-280 Valor



Source: Bell.

Figure 3.Sikorsky-Boeing SB-1 Defiant



Source: Sikorsky.

FARA

Five competitors have been selected to develop technologies for FARA. Those awards went to

- AVX/L-3;
- Bell;
- Boeing;
- Karem Aircraft/Raytheon/Northrop Grumman; and
- Sikorsky.

The Army makes clear that these aircraft are technology demonstrators, not finished prototypes. Rather than being developed against a particular set of performance criteria, they are intended to increase the understanding of different approaches to FVL that will inform future program decisions. The next major decision is a 2020 downselect to two vendors for the final design, build, and test phase, which is expected to provide the required data for a final FARA selection in FY2024.

Sikorsky is already flying a prototype FARA, the S-97 Raider. Bell has revealed its FARA concept, the 360 Invictus.

Figure 4.Sikorsky S-97 Raider



Source: Sikorsky.

Figure 5.Bell 360 Invictus Concept



Source: Bell.

An actual request for proposals for FVL design concepts is now expected in the fourth quarter of FY2021, with initial contracts awarded in FY2023. That delay from the previous schedule may be due to the unavailability of the SB-1. The Army had originally anticipated both prototypes flying by the end of calendar 2017.

Figure 6.FARA Schedule

Events	Start	
	Quarter	Year
Competitive Prototype Design	3	2019
Competitive Prototype Build	3	2020
Competitive Prototype Test	1	2023
Material Development Decision	2	2022
Milestone B Document Development	2	2022
Contract Requirement Package Development	2	2022
Request for Proposal Release	1	2024
Proposal Submission/Evaluation	1	2024
Milestone B	4	2024

Source: FY2020 budget submission for Research, Development, Test & Evaluation, Army.

Funding

FVL funding is carried in the Research and Development, Army budget in PE 0603801A, Aviation Advanced Development. That budget was funded at \$86.2 million in FY2019; the FY2020 request is for \$31.9 million, going to \$652.9 million by FY2024. Separately, the FY2020 request for FARA (under the same PE) is \$427.3 million.

Since its inception, FVL has relied on investment by industry to advance its technologies. Although the companies have not released exact figures, they have consistently pushed for the Army to increase its commitment to the R&D phase and to define a deployment schedule and plan that could inform corporate investment decisions.

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