GAO

Weapon Systems Annual Assessment

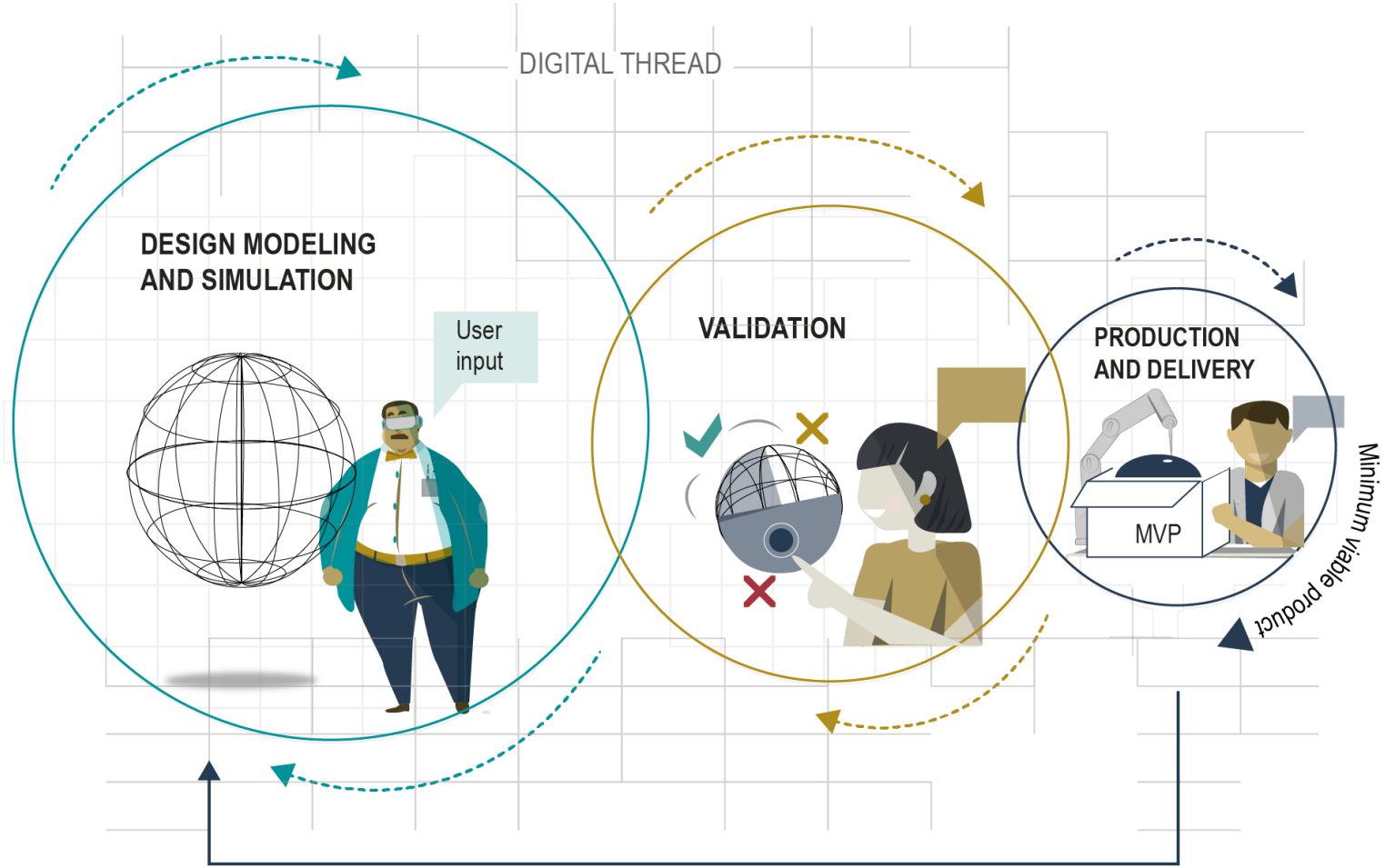
DOD Leaders Should Ensure That Newer Programs Are Structured for Speed and Innovation

For more information, contact Erin Carson, carson@gao.gov

Criteria for Assessing Weapon Acquisitions are Evolving

	Traditional Best Practices	New Leading Practices
Goals of the work	Provide independent, forward-looking criteria for evaluating DOD acquisition programs	Refresh methodology for new product types and tools and develop criteria applicable to any acquisition program
Types of products	Hardware-centric	Hardware and software hybrid
Emergent priorities	Capability and cost	Schedule
Predominant models	Linear, incremental development	Iterative, agile development
Key theme of findings	Knowledge attainment	Speed to market

Iterative Cycles Drive Rapid Development of Complex, Innovative Products



Source: GAO analysis of leading company information; GAO (illustration). | GAO-23-106222

2025 DOD Weapon Systems Assessment

Reporting Objectives:

1. What are the characteristics of DOD's portfolio of its costliest weapon programs, how have selected programs performed over time in terms of cost and schedule, and what are the reasons for this performance?
2. To what extent do selected programs follow or plan to follow GAO's leading practices for product development during the acquisition process?
3. To what extent have selected programs implemented modern software development approaches and recommended cybersecurity practices?

Implementation of Leading Product Development Practices as of January 2025

Iteratively Develop a Minimum Viable Product (MVP)
Refine high-level operational needs into an MVP *(the initial set of capabilities that meets end user needs, can be fielded most quickly, and can be successively updated)*
Use Digital Engineering to Connect Stakeholders and End Users to System Data
Develop a full system-level digital twin *(a dynamic virtual representation of a physical product or system)*
Develop a digital thread *(an analytical framework that connects stakeholders and end users with dynamic data across a system's life cycle)*
Validate Integrated Hardware and Software Functionality in the Operating Environment
Test a system-level integrated fully digital prototype in a digital operational environment
Test a system-level integrated physical prototype in an operational environment, with data from the testing connected to a digital twin or digital thread
Prepare for Modularity to Support Production and Updates to the MVP
Incorporate a modular open systems approach (MOSA)

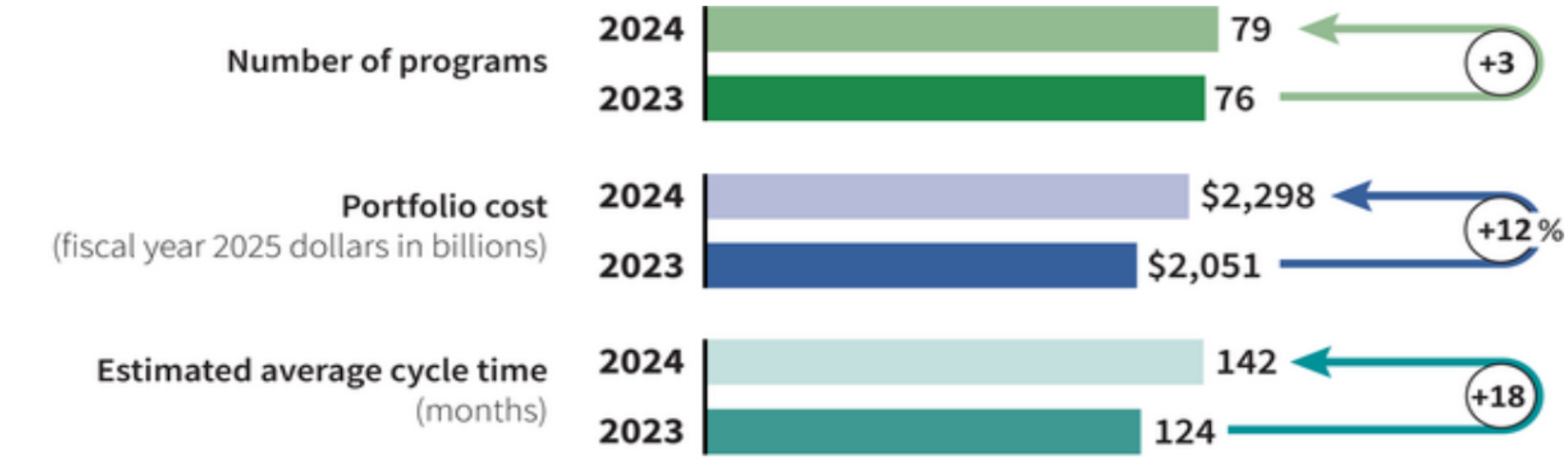
Overview: DOD Plans to Invest Nearly $2.4 Trillion in its Weapon Portfolio

Type of program	Number of programs reviewed	Total planned investment	Air Force	Army	Navy	Space Force	Joint DOD
Major defense acquisition programs (MDAP)	79	$2,298.2[a]	15	17	37	9	1
Middle tier of acquisition programs (MTA)	20	$44.5[b]	3	8	2	7	0
Future major weapon acquisitions	7	$25.2[c]	0	2	5	0	0
Total	106	$2,367.9	18	27	44	16	1

Source: GAO analysis of Department of Defense data. | GAO-25-107569

[a]Planned investment amounts for MDAPs do not include three programs that have yet to provide official cost estimates since transitioning from the MTA pathway—B-52 Commercial Engine Replacement Program, Deep Space Advanced Radar Capability, and Protected Tactical SATCOM.
[b]Planned investment amounts for MTA programs reflect the current costs reported by those programs, many of which are planning follow-on efforts that are not included in these costs.
[c]Planned investment amounts for future major weapon acquisitions reflect current costs reported by those programs, which may not include the costs of later development and procurement efforts.

MDAP Portfolio Increased in Cost and Schedule

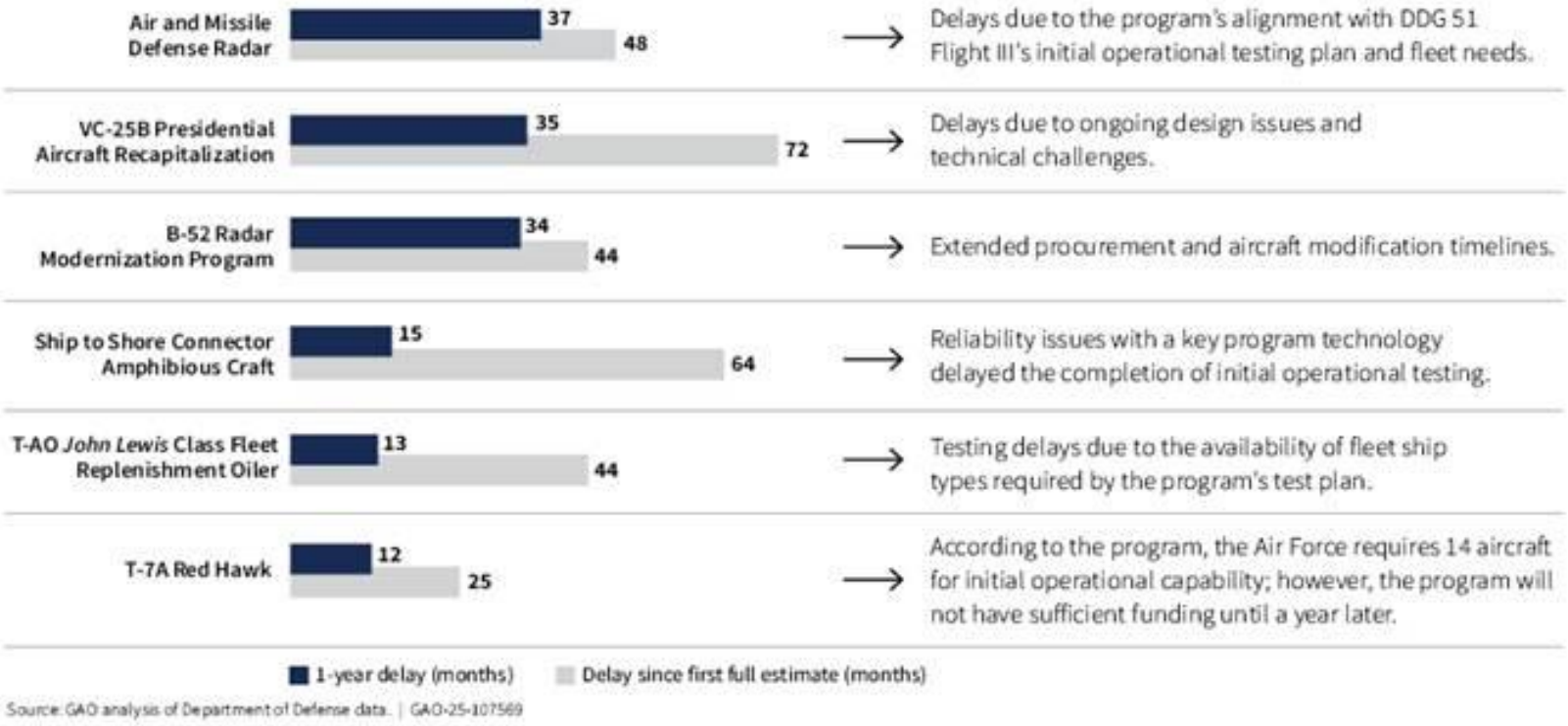


Source: GAO analysis of Department of Defense data. | GAO-25-107569

MDAPs Continue to Delay Initial Operational Capability

- We assessed a subset of 39 MDAPs between the start of development and the early stages of production.

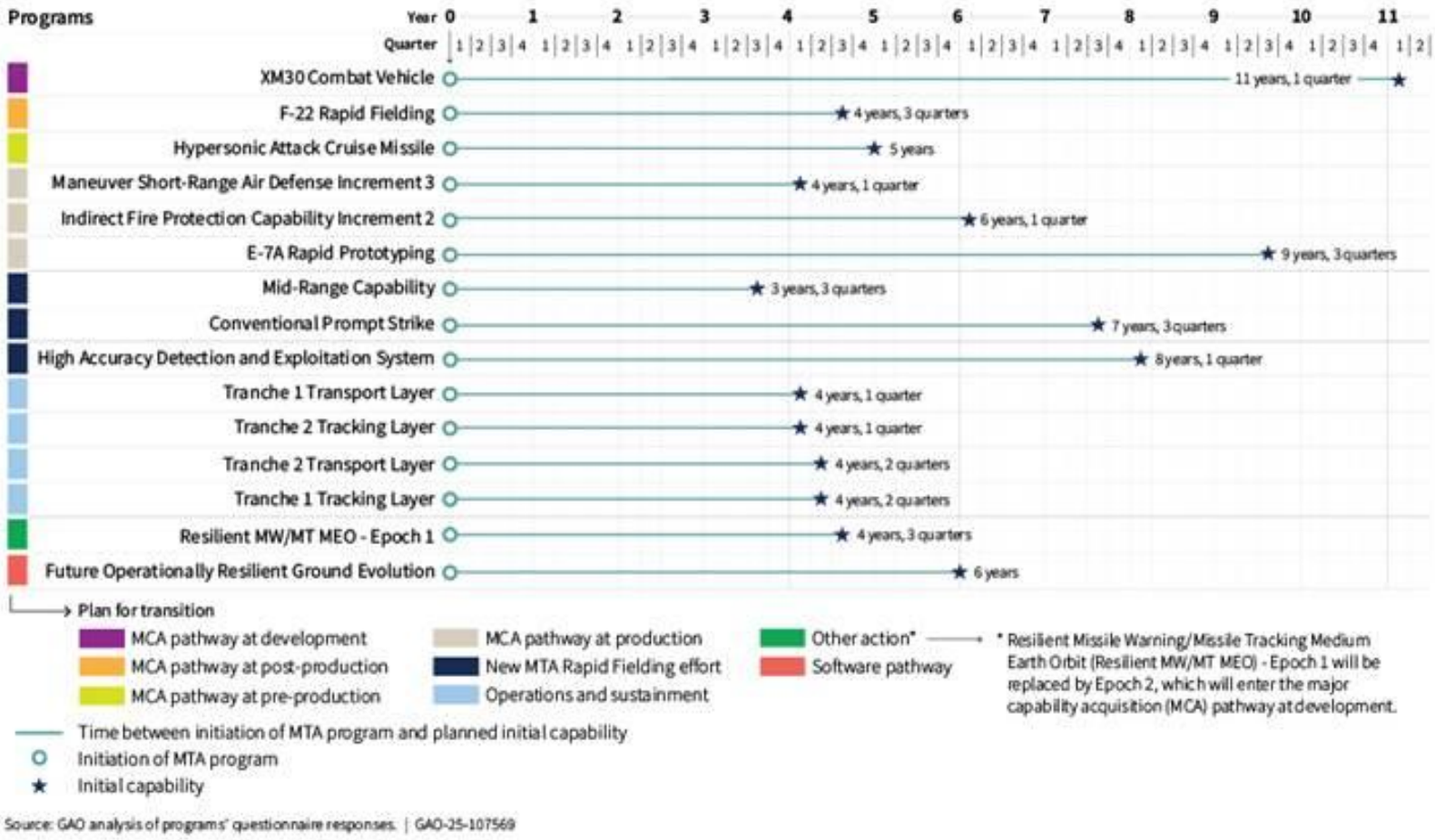
Figure 10: Delays of Approximately 12 Months or More to Planned Initial Operational Capability Over the Past Year (months)



Source: GAO analysis of Department of Defense data. | GAO-25-107569

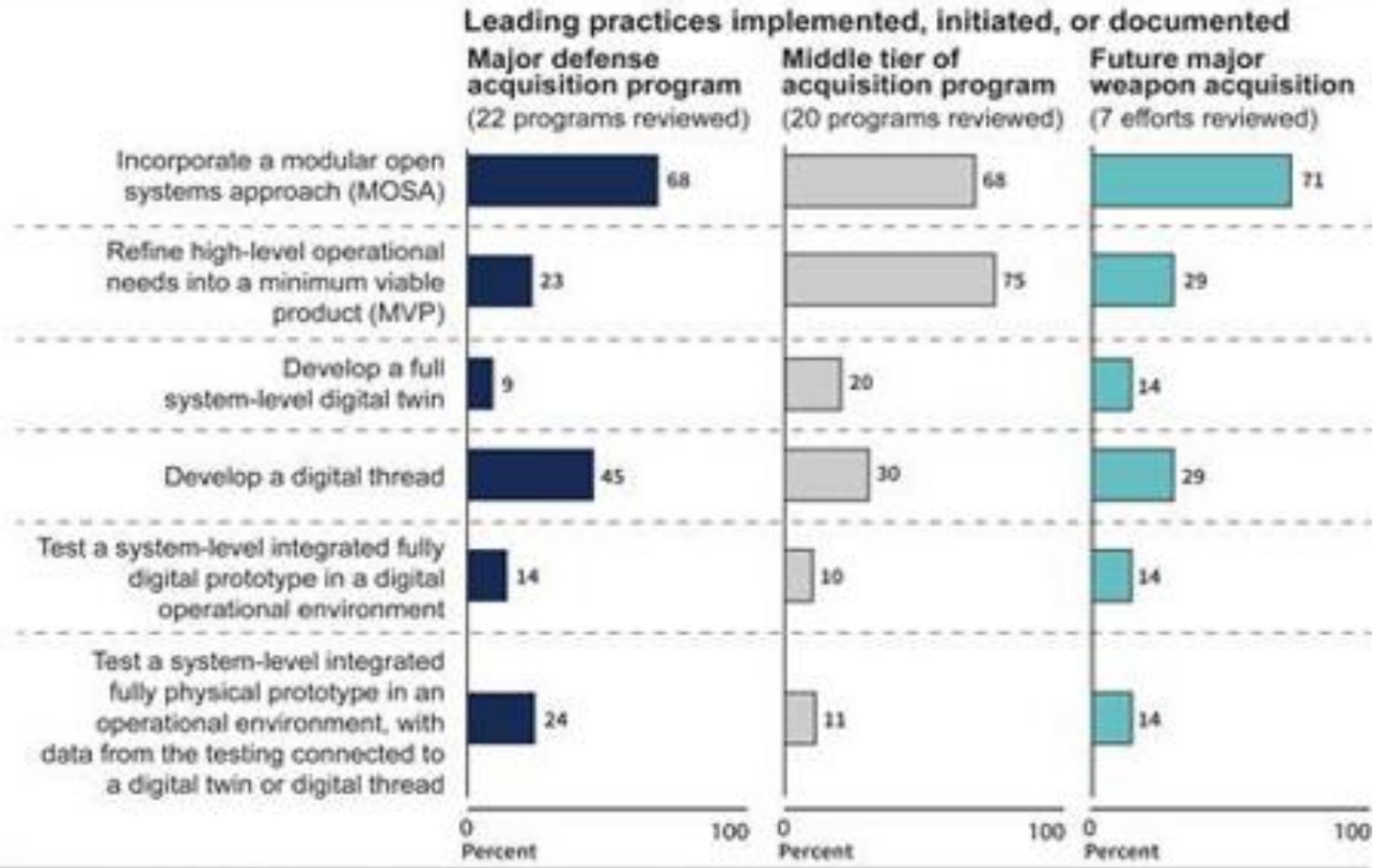
MTA programs report wide range of time frames for delivering fieldable capabilities

Figure 15: Planned Time Between Initiation and Initial Capability for Selected Middle Tier of Acquisition (MTA) Programs



Source: GAO analysis of programs' questionnaire responses. | GAO-25-107569

Most programs are not leveraging leading practices to maximize outcomes



Source: GAO analysis of programs' questionnaire responses. | GAO-25-107569

Newer programs are missing opportunities to deliver capability with speed

Figure 26: Future Major Weapon Acquisitions Are Not Using Multiple Leading Practices Together

	Programs	Leading practices: Minimum Viable Product	Full System-Level Digital Twin	Digital Thread	Test Digital Prototype[a]	Test Physical Prototype[b]	MOSA Incorporated
Naval vessels	Guided Missile Destroyer ((DDG(X))	○	○	◐	○	○	○
	Medium Landing Ship (LSM)	○	○	○	○	○	◔
	Large Unmanned Surface Vessel (LUSV)	○	○	◐	○	○	●
	Extra-Large Unmanned Undersea Vehicle (XLUUV)	○	○	○	○	○	○
Naval munition	Mark 54 MOD 2 Advanced lightweight torpedo (Mk-54 MOD 2)	◐	○	○	◔	○	●
Army munition	Long-Range Hypersonic (LRHW)	●	○	○	○	○	●
Army radar	Lower-Tier Air and Missile Defense Sensor (LTAMDS)	○	◐	○	○	◐	●

● Practice implemented
◐ Practice initiated
◔ Practice documented but not initiated
○ Practice neither documented nor initiated

MOSA = Modular Open Systems Approach

Source: GAO analysis of programs' questionnaire responses. | GAO-25-107569

[a]Test a system-level integrated fully digital prototype in a digital operational environment.
[b]Test a system-level integrated physical prototype in an operational environment, with data from the testing connected to a digital twin or digital thread.

Medium Landing Ship (LSM)

Source: U.S. Navy. | GAO-25-107569

Long Range Hypersonic Weapon Program (LRHW)

Source: U.S. Army. | GAO-25-107569

Recommendations for Executive Action

GAO made a total of four recommendations for DOD leadership to take steps to ensure that future major weapon acquisition programs include leading practices for product development during the earliest stages of the programs. DOD concurred with the recommendations.

Questions

NAVY | ARMY | AIR FORCE | SPACE FORCE

Future Long Range Assault Aircraft (FLRAA), LGM-35A Sentinel, and GPS III Follow-On (GPS IIIF)

Source: Bell Textron, Inc.; U.S. Air Force; and Lockheed Martin Corporation, respectively. | GAO-25-107569

Backup: Individual Program Assessments

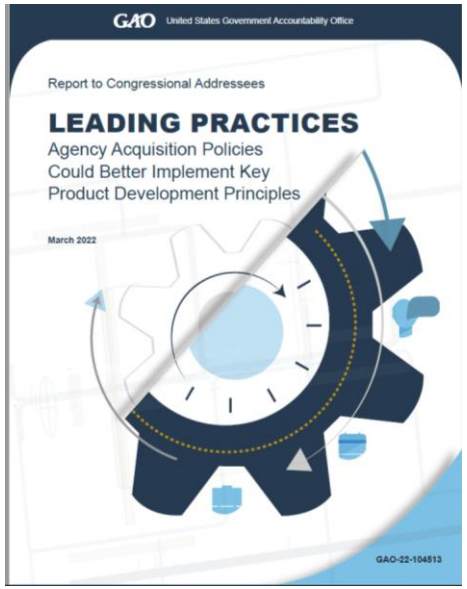
- A Illustration or photo of system
- B Program description
- C Timeline identifying key dates for the program including, the start of development, major decision reviews, production decision and planned operational capability. Where applicable, "major capability transition" indicates when the program transitioned to the major capability acquisition pathway
- D **Program Performance** Cost, quantity, and schedule data as of the program's first full estimate (baseline), estimate as of last year (GAO's 2024 assessment) and current estimate. We depict only the program's main elements of acquisition cost – research and development and procurement. However, total program costs may also include military construction and acquisition operation and maintenance. Schedule data is presented as a cycle time comparison of planned number of months from program start to initial capability
- E **Software Development** Software approach employed, software cost and percentage of total acquisition cost accounted for by software development, and percentage of progress to meet current requirements
- F **Implementation of Leading Product Development Practices** Depiction of selected leading product development practices and the program's progress in attaining that knowledge
- G **Program Essentials** Programmatic information including prime contractor (or other identified contractors) and contract type
- H Assessment of program performance, implementation of leading product development practices, as well as software, cybersecurity, and other program issues
- I **Program Office Comments** General comments provided by the cognizant military service or program office

GAO produced 65 one and two-page assessments of 69 weapon programs.

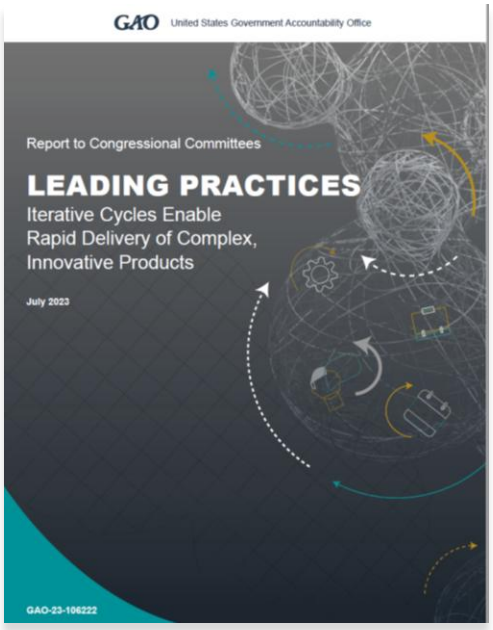
- We assessed program performance, including cost and schedule performance, leading product development practices, software and cybersecurity efforts, among other issues.
- Figure provides a representative sample of a program assessment

Backup: Leading Practices for Product Development

GAO-22-104513



GAO-23-106222



GAO-25-107130

Public Affairs

Sarah Kaczmarek, Managing Director, Media@gao.gov

Congressional Relations

Dave Powner, Managing Director, CongRel@gao.gov

Connect with GAO

Connect with GAO on Facebook, X, LinkedIn, Instagram, and YouTube. Subscribe to our Email Updates. Listen to our Podcasts.

Visit GAO on the web at https://www.gao.gov.

Copyright