

# Weapon Systems Annual Assessment

## Limited Use of Knowledge-based Practices Continues to Undercut DOD's Investments (GAO-19-336SP)

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May 2019



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Sources: (Left to Right) Patriot Advanced Capability-3 Missile Segment Enhancement, U.S. Army; VH-92A Presidential Helicopter Replacement, 2016 Sikorsky Aircraft Corporation, a Lockheed Martin Company; Next Generation Operational Control System, U.S. Air Force; and F-35 Lightning II, 2016 Lockheed Martin.

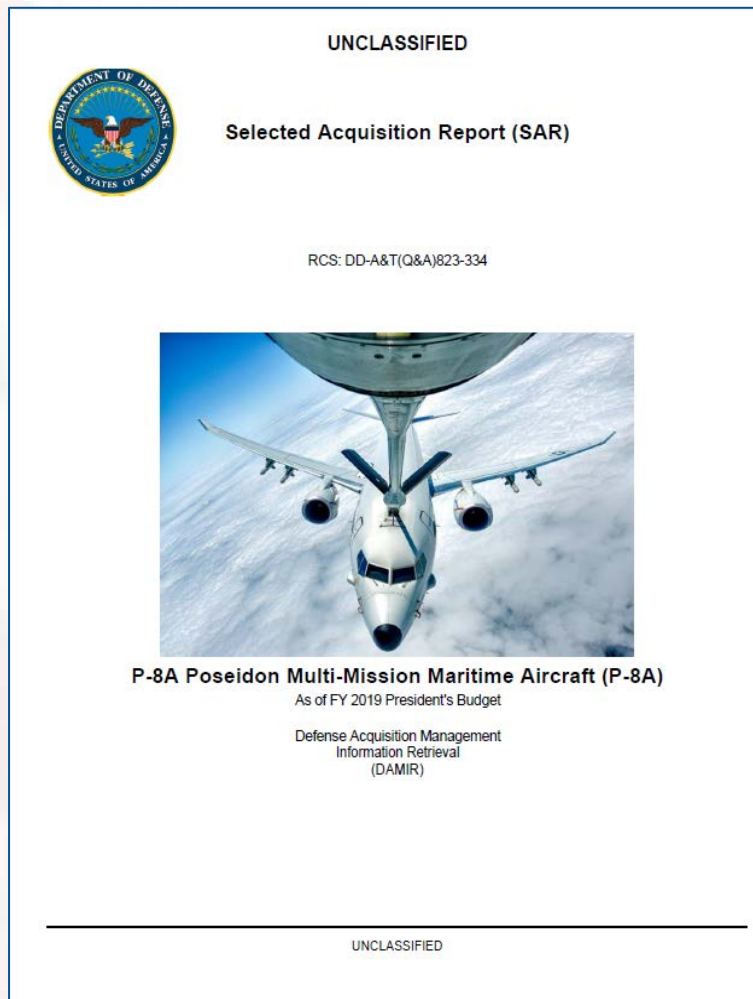
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## Key Observations

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1. DOD's 2018 portfolio of major defense acquisition programs (MDAP) was smaller, yet older and more expensive than last year.
2. DOD programs competed one-third of currently reported major contracts, with nearly half of awards concentrated within five companies.
3. Although knowledge-based acquisition practices can lead to better cost and schedule outcomes, programs continue to not fully implement them.

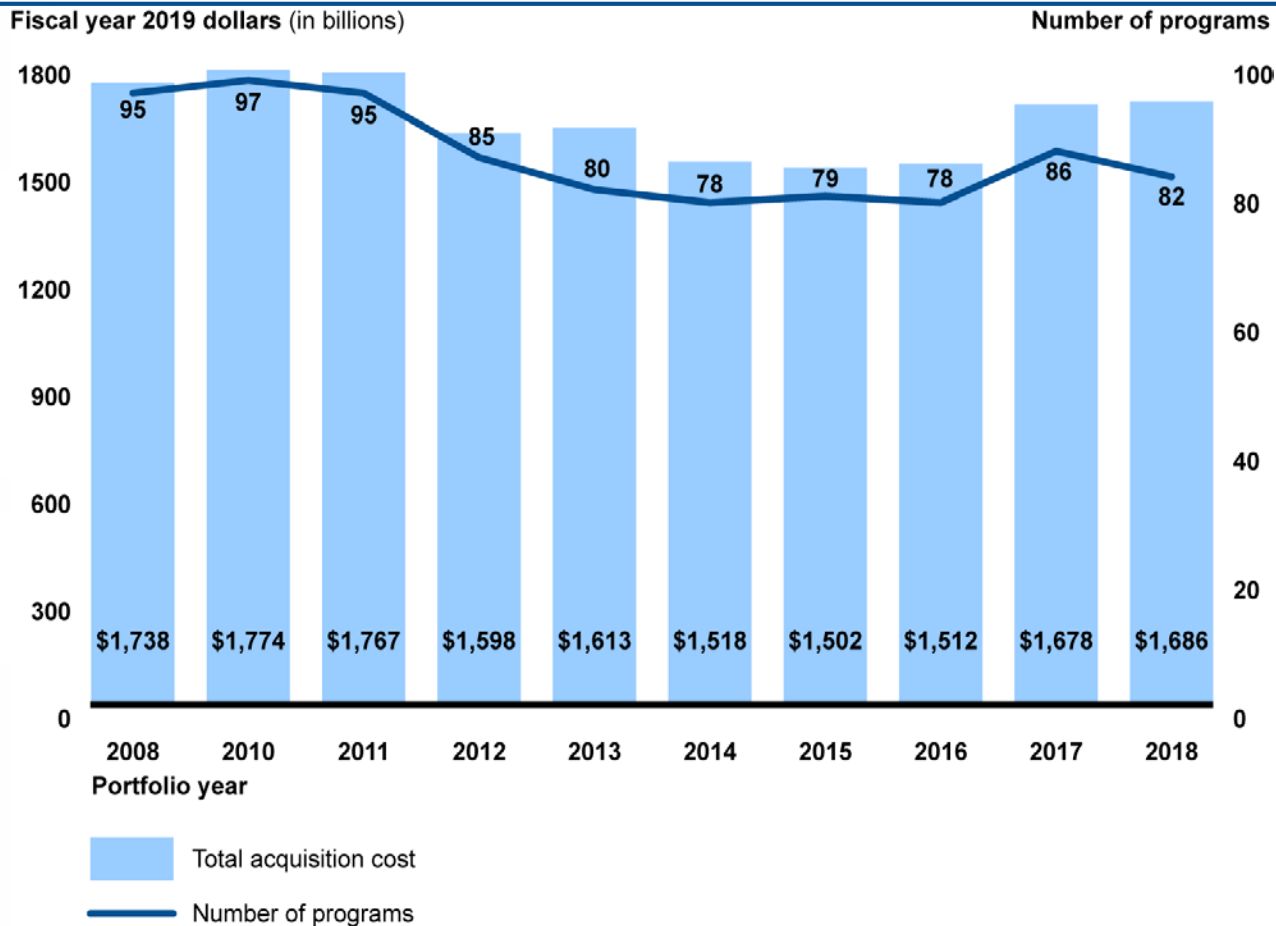
# Scope and Methodology



- Using DOD's annual Selected Acquisition Reports (SAR), we analyzed cost and schedule performance and major contract awards for the 82 MDAPs that comprised the 2018 portfolio.
- In addition to SARs, we also relied on Federal Procurement Data System—Next Generation (FPDS-NG) data to complete our contracting analysis.
- We used 51 current and future MDAPs' responses to an acquisition management questionnaire to analyze implementation of knowledge-based acquisition practices.

# Cost and Schedule Performance

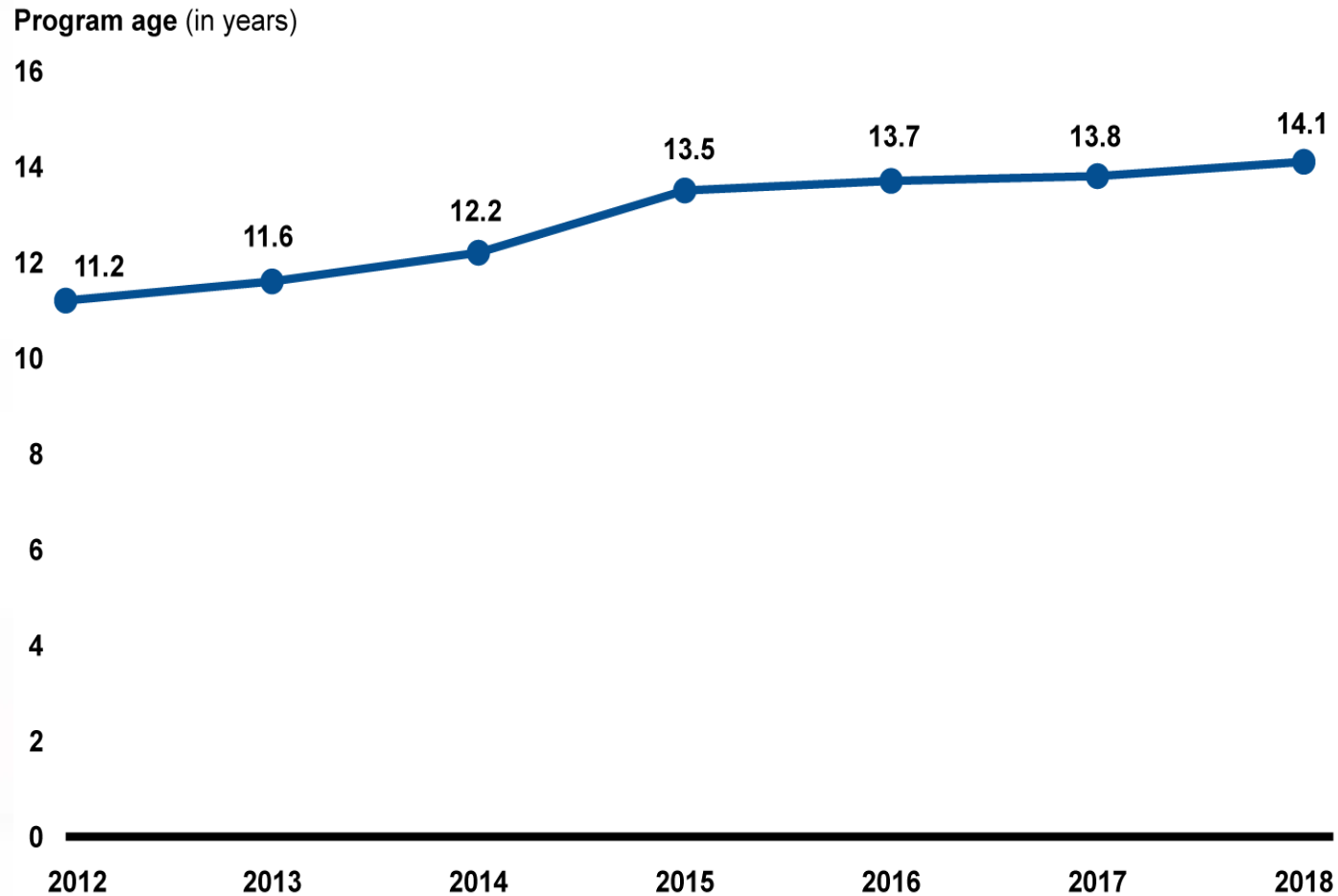
# Historical DOD Portfolio Comparison



Source: GAO analysis of Department of Defense data. | GAO-19-336SP

Note: DOD did not issue Selected Acquisition Reports (SAR) in 2009, which prevents us from obtaining the cost baseline information necessary to include 2009 in this analysis.

# Annual Change in Average Program Age in DOD's Portfolio of Major Defense Acquisition Programs, 2012-2018



Source: GAO analysis of Department of Defense data. | GAO-19-336SP



## Cost and Schedule Changes to DOD's 2018 Portfolio of 82 MDAPs over the Past Year (fiscal year 2019 dollars in billions)

	Estimated portfolio cost in 2017	Estimated portfolio cost in 2018	Estimated portfolio change since 2017	Percentage change since 2017
Total estimated research and development cost	300.50	304.47	3.97	1.3 percent
Total estimated procurement cost	1,344.25	1,365.29	21.04	1.5 percent
Total estimated acquisition cost	1,659.03	1,685.65	26.62	1.6 percent
Average cycle time in months to deliver initial capabilities	120.1	121.9	1.8	1.5 percent

Source: GAO analysis of Department of Defense data. | GAO-18-360SP

Note: In order to make the two portfolios comparable, we added the first full estimates of the two entering programs to last year's portfolio and removed funding and schedule information of the six programs that exited the portfolio since last year.



## Cost and Schedule Changes to DOD's 2018 Portfolio of 82 MDAPs since First Full Estimate (fiscal year 2019 dollars in billions)

	Dollar change	Percentage change
Total research and development cost	103.49	51.5
Total procurement cost	461.42	51.0
Total other (military construction and operations and maintenance) acquisition cost	4.50	39.6
Total acquisition cost	569.41	51.0
Average delay in delivering initial capabilities (months)	27.4	34.9

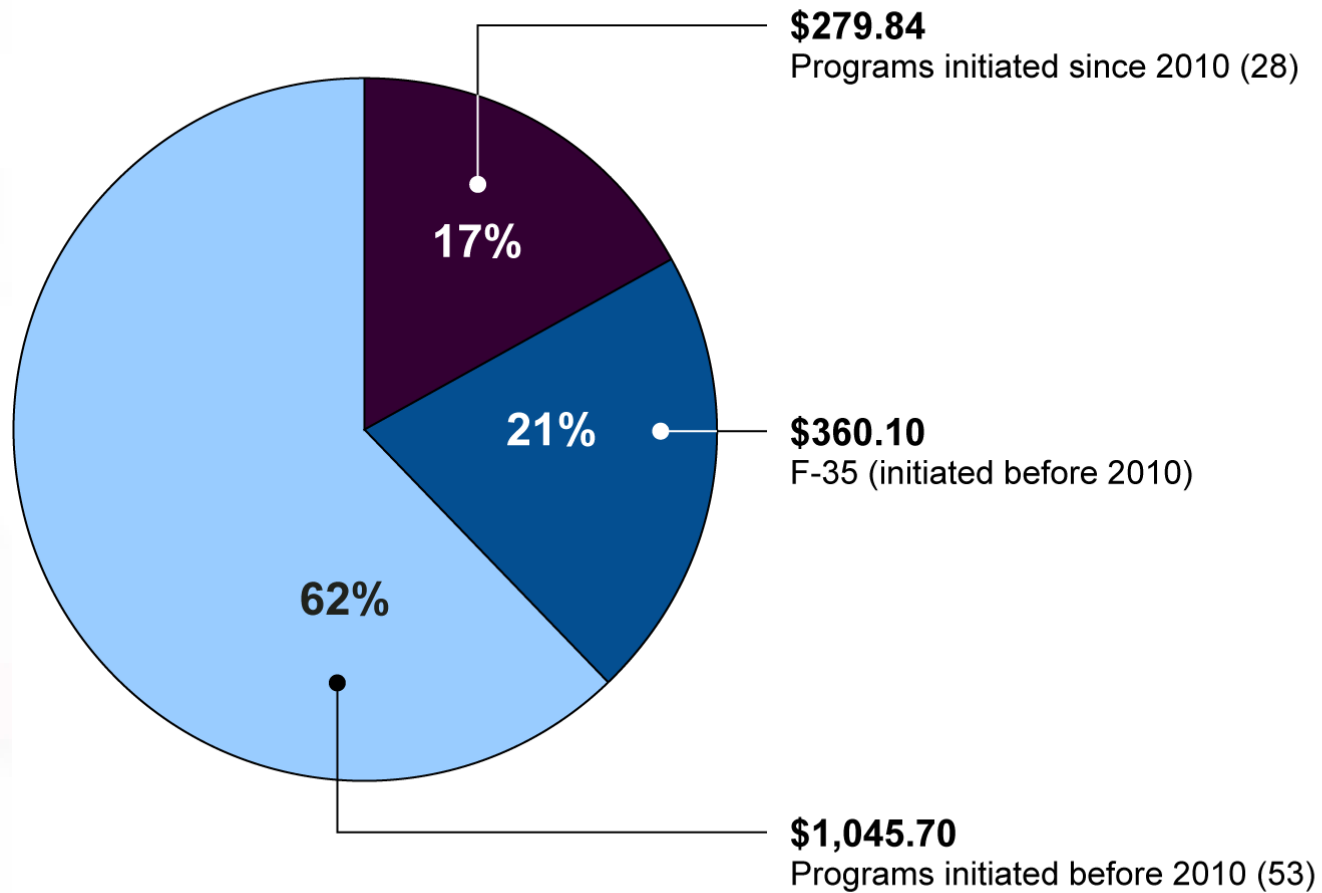
Source: GAO analysis of Department of Defense data. | GAO-18-360SP

Note: In order to make the two portfolios comparable, we added the first full estimates of the two entering programs to last year's portfolio and removed funding and schedule information of the six programs that exited the portfolio since last year.



# Distribution of Total Acquisition Costs among Various Groups of Programs

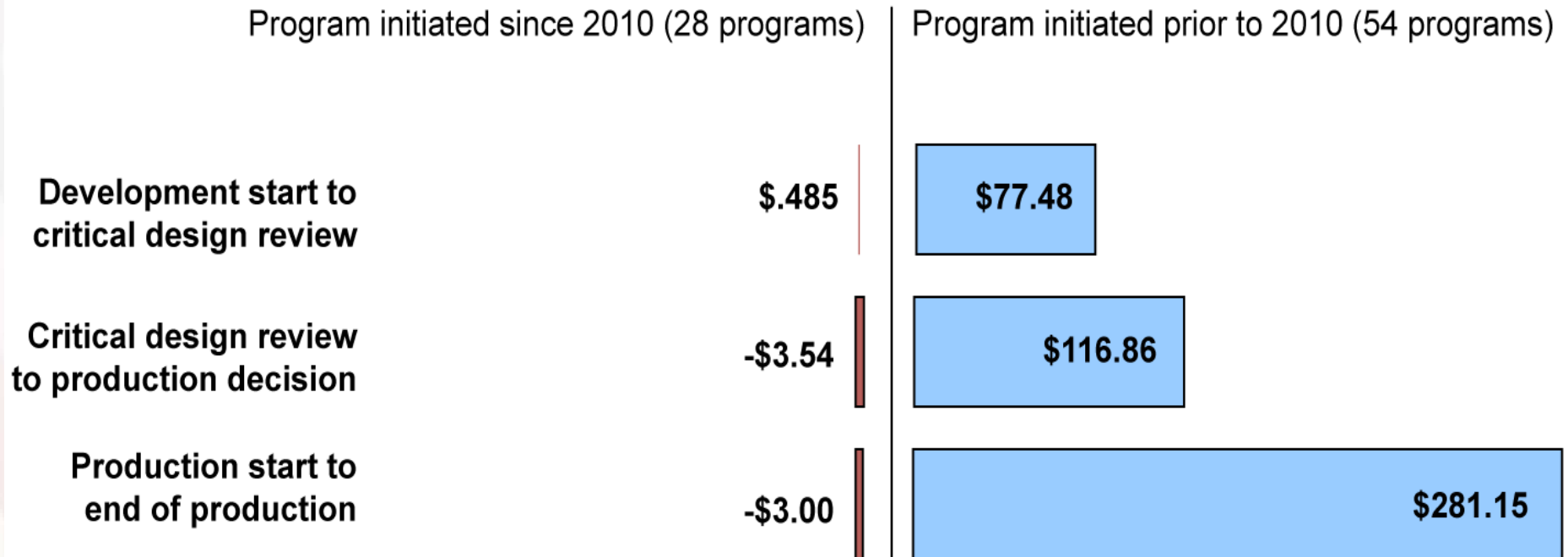
Fiscal year 2019 dollars (in billions)



Source: GAO Analysis of Department of Defense data. | GAO-19-336SP

# Programs' Total Acquisition Cost Changes since First Full Estimate by Acquisition Phase

Fiscal year 2019 dollars (in billions)



Source: GAO analysis of Department of Defense data. | GAO-19-336SP

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# Competition in Contracting



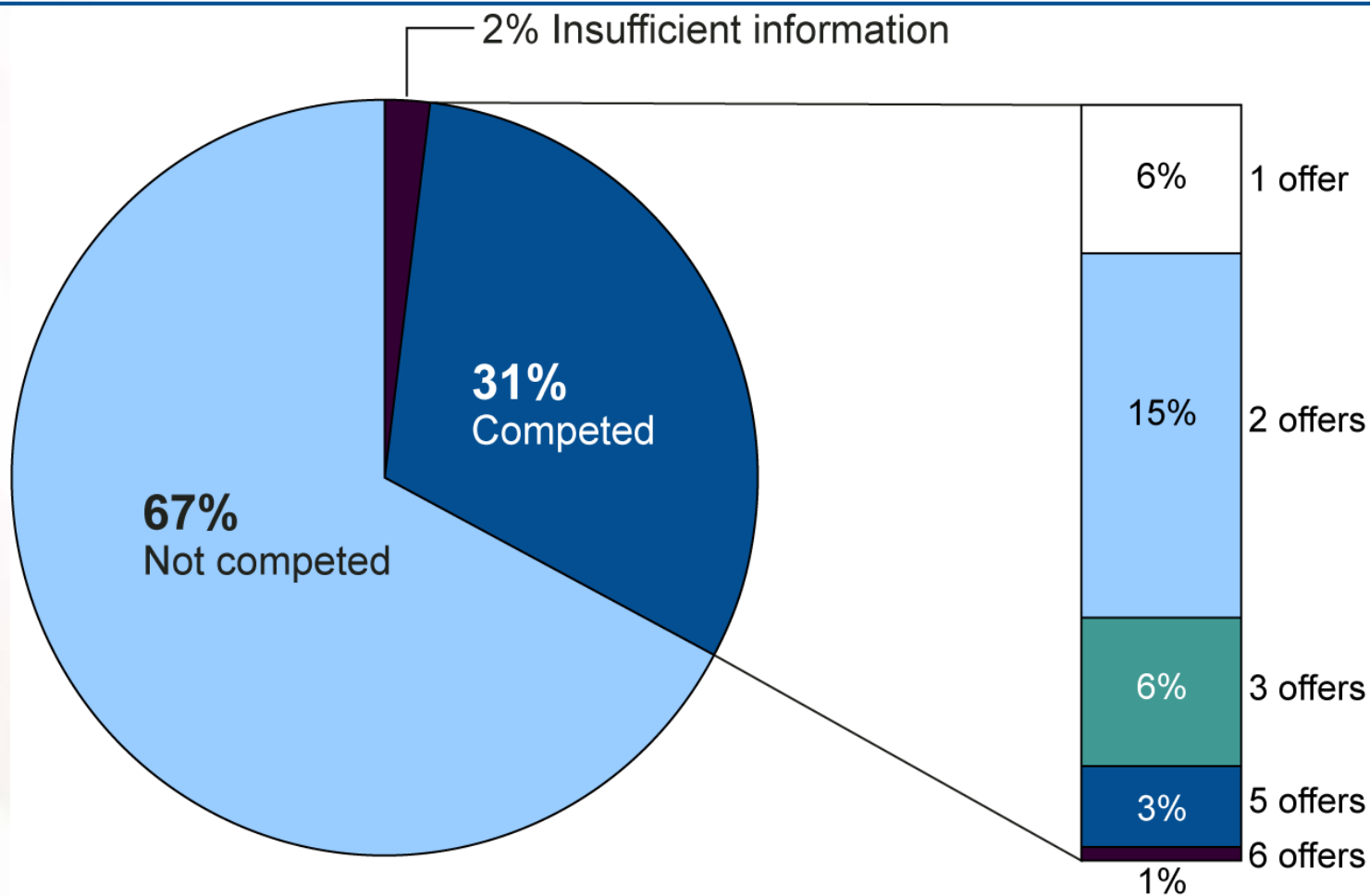
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## Analysis of DOD's Performance in Generating Competition in Contracting within Its 2018 MDAP Portfolio

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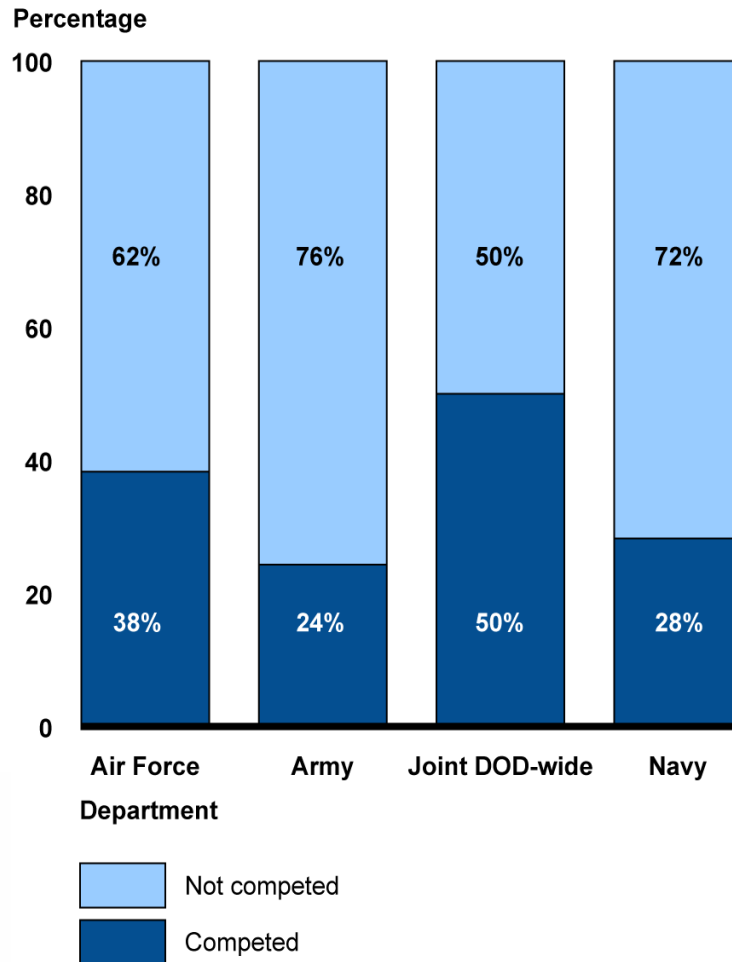
- We compiled a list of all 183 active, major contracts and orders identified in individual programs' 2017 SARs and compared them to information in the FPDS-NG database.
- Of the 183 contracts and orders included in our review:
  - the department awarded 180 for development and procurement efforts,
  - the Navy awarded 85 contracts that totaled \$147.1 billion,
  - the Air Force awarded 51 contracts that totaled \$132.6 billion,
  - the Army awarded 37 contracts that totaled \$50.5 billion, and
  - Joint, DOD-wide offices awarded 10 contracts that totaled \$33.8 billion.

# Competition in 183 Currently Reported Major Contracts and Number of Offers Received



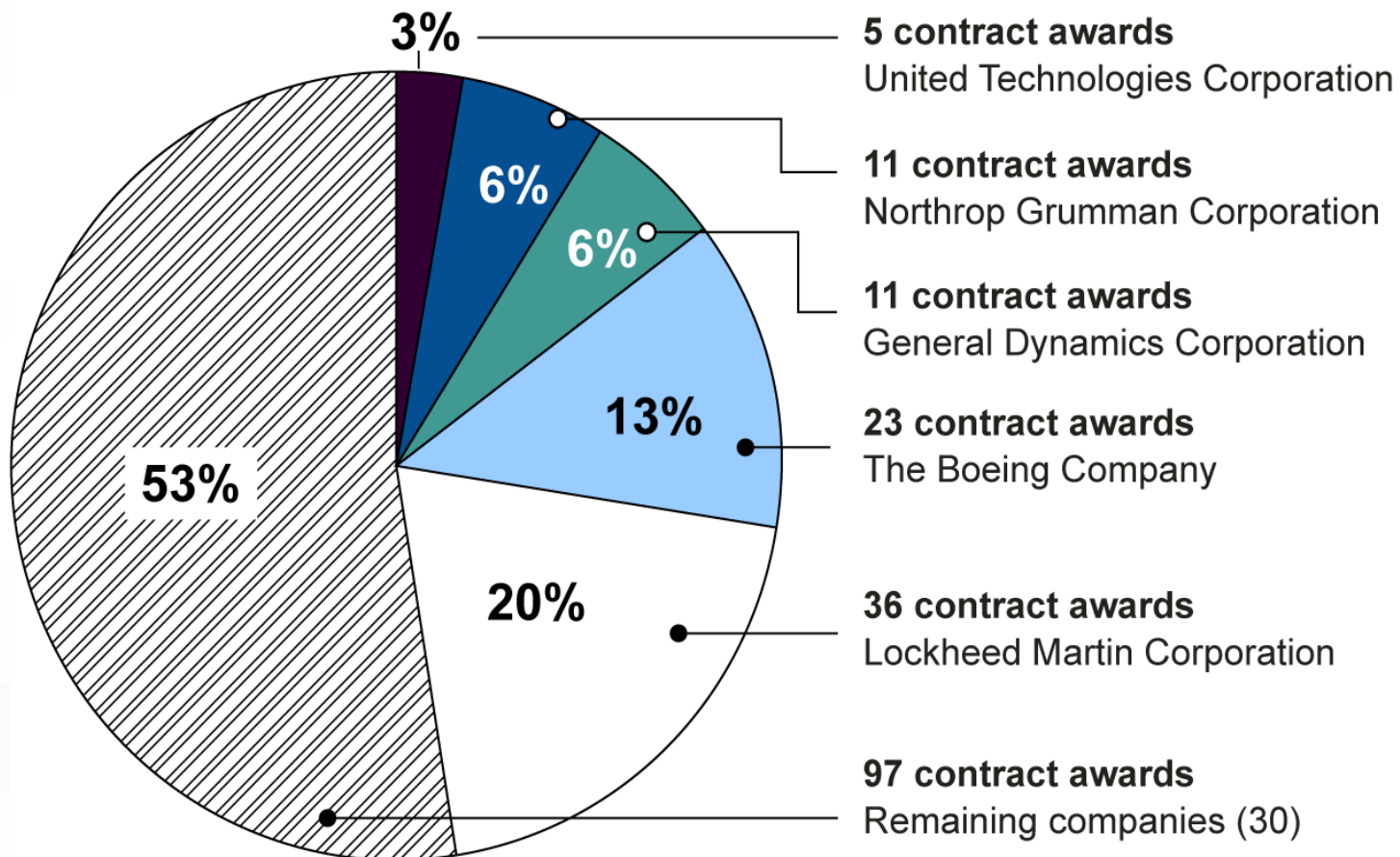
Source: GAO analysis of Federal Procurement Data System—Next Generation data. | GAO-19-336SP

# Competition Rates for 183 Currently Reported Major Contract Awards within DOD's 2018 MDAP Portfolio



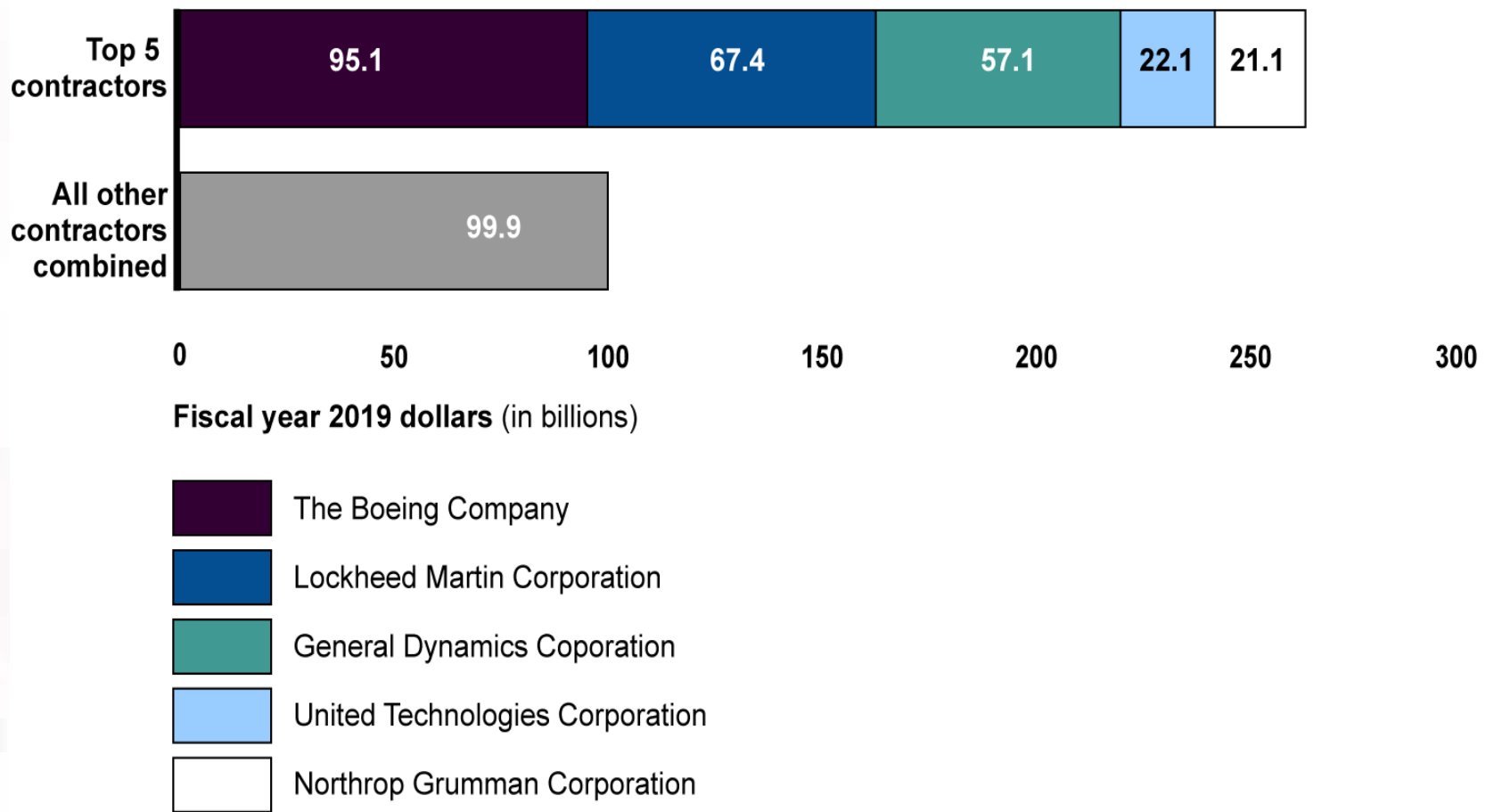
Source: GAO analysis of Federal Procurement Data System—Next Generation data. | GAO-19-336SP

# Distribution of Contract Awards among Prime Contractors for 183 Currently Reported Major Contracts within DOD's 2018 MDAP Portfolio



Source: GAO analysis of Federal Procurement Data System—Next Generation data. | GAO-19-336SP

# Distribution of Dollars among Prime Contractors for 183 Currently Reported Major Contracts within DOD's 2018 MDAP Portfolio



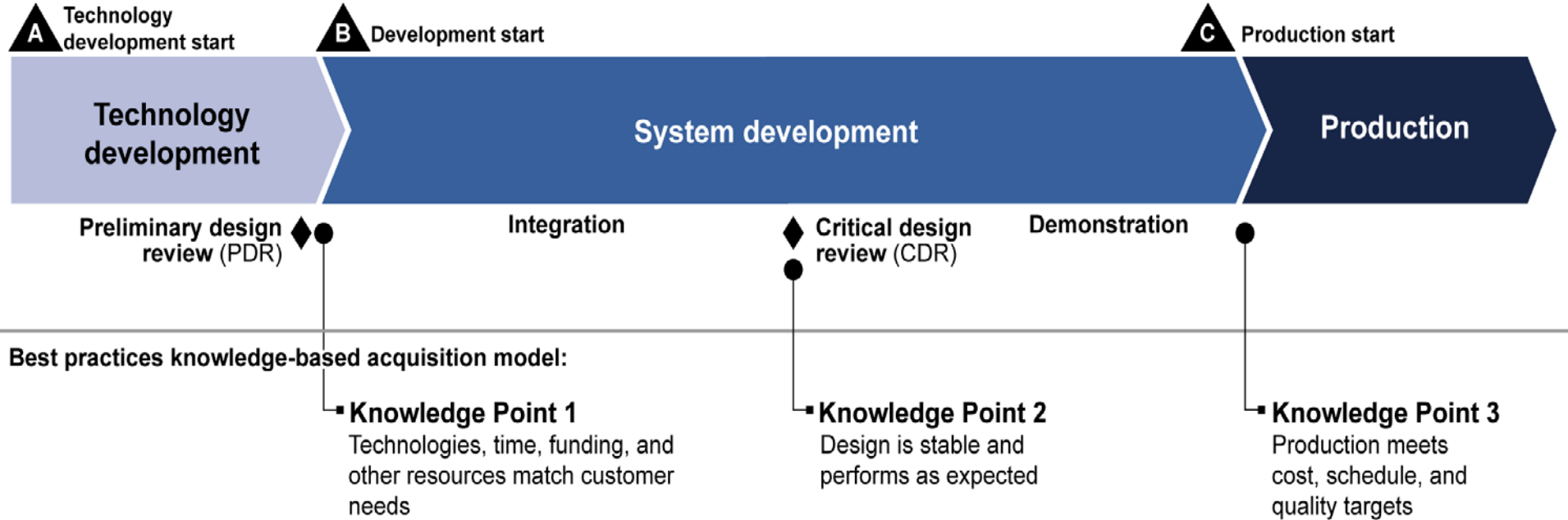
Source: GAO analysis of Federal Procurement Data System—Next Generation data. | GAO-19-336SP



# Knowledge-based Acquisition Practices

# Defense Acquisition Cycle and GAO-Identified Knowledge Points

Milestones:



Source: GAO analysis of DOD-provided data, DOD Instruction 5000.02, and best practices. | GAO-19-336SP

# DOD MDAPs Continue to Not Fully Implement Key Knowledge-based Acquisition Practices

Practices associated with the three key knowledge points (KP)	Programs that completed the KP before this assessment period	Programs that completed the KP during this assessment period
<b>KP 1 practices</b>	<b>38 programs</b>	<b>Four programs</b>
Demonstrate all critical technologies are very close to final form, fit, and function within a relevant environment	●	●
Demonstrate all critical technologies are in form, fit, and function within a realistic environment	○	○
Completed preliminary design review before system development start	●	○
<b>KP 2 practices</b>	<b>33 programs</b>	<b>Two programs</b>
Release at least 90 percent of design drawings to manufacturing	○	●
Test a system-level integrated prototype	○	○
<b>KP 3 practices</b>	<b>15 programs</b>	<b>Three programs</b>
Demonstrate critical manufacturing processes are in statistical control	○	○
Demonstrate critical processes on a pilot production line	●	●
Test a production-representative prototype in its intended environment	○	●

Programs completing each best practice: ● 75 - 100 percent; ◐ 50 - 74 percent; ○ 0 - 49 percent

Source: GAO analysis of Department of Defense data. | GAO-19-336SP

## Certain Knowledge-Based Acquisition Practices Correspond with Better Cost and Schedule Outcomes

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- We analyzed 17 programs that have completed system development, held a critical design review, and started production (i.e., completed knowledge points 1 through 3).
- We observed, on average, MDAPs that completed one or more of three specific practices had significantly lower cost and schedule growth than those that did not.
- These three practices were:
  1. demonstration that all critical technologies were very close to final form, fit, and function, within a relevant environment, before starting development;
  2. completion of a preliminary design review prior to starting development; and
  3. released at least 90 percent of their design drawings to manufacturing by critical design review.

# Questions?

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