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DoD PPBE Reform Literature Review: Analysis of Public Recommendations

EXECUTIVE SUMMARY AND REPORT
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ACKNOWLEDGEMENTS

ACRONYMS AND ABBREVIATIONS

ACDB	Advanced Capabilities and Deterrence Board
ADCP	Advanced Capability and Deterrence Panel
AFWERX	Air Force Work Project
AI	Artificial Intelligence
AIRC	Acquisition Innovation Research Center
APB	Acquisition Program Baseline
ATR	Above Threshold Reprogramming
BA-8	Budget Activity Eight
BLIs	Budget Line Items
BTR	Below Threshold Reprogramming
CAE	Component Acquisition Executive
CAPE	Cost Assessment and Program Evaluation
CCMD	Combatant Command
CCMND	Combatant command
CDAO	Chief Digital and Artificial Intelligence Officer
CEB	Chief of Naval Operations Executive Board
CFT	Cross-Functional Team
COCOMs	Combatant Commands
DA	Decision Authority
DCTC	Defense Civilian Training Corps
DDS	Defense Digital Service
DeFi	Decentralized Finance Allocation
DepSecDef	Deputy Secretary of Defense
DeRA	Decentralized Resource Allocation
DIU	Defense Innovation Unit
DMAG	Defense Management Action Group
DoD	Department of Defense
DPG	Defense Planning Guidance
DSD	Deputy Secretary of Defense
EDI	European Deterrence Initiative

EVM	Earned Value Management
FAR	Federal Acquisition Regulations
FERC	Federal Energy Regulatory Commission
FFRDC	Federally Funded Research and Development Center
FMR	Financial Management Regulation
FYDP	Future Years Defense Program
GAO	Government Accountability Office
GTA	General Transfer Authority
IDIQ	Indefinite-Delivery/Indefinite-Quantity
IMP	Integrated Master Plan
IMS	Integrated Master Schedule
IP	Intellectual Property
IPL	Integrated Priority List
JADC2	Joint All-Domain Command and Control
JAIC	Joint Artificial Intelligence Center
JCIDS	Joint Capabilities Integration and Development System
JROC	Joint Requirements Oversight Council
LPTA	Lowest Price Technically Acceptable
MDAPs	Major Defense Acquisition Programs
MTA	Middle Tier of Acquisition
NCSC	National Counterintelligence and Security Center
NDAA	National Defense Authorization Act
NDIA	National Defense Industrial Association
NDS	National Defense Strategy
NSCAI	National Security Commission on Artificial Intelligence
O&M	Operations and Maintenance
OCO	Overseas Contingency Operations
ODNI	Office of the Director of National Intelligence
OMB	Office of Management and Budget
OR	Operations Research
OSD	Office of the Secretary of Defense
OSD R&E	Office of the Secretary of Defense Research and Engineering

OTA	Other Transaction Authority
OUSD	Office of the Under Secretary of Defense
PAF	Project Air Force
PDI	Pacific Deterrence Initiative
PE	Program Element
PEOs	Program Executive Officers
PM	Program Manager
POM	Program Objective Memorandum
PPBE	Planning, Programming, Budgeting, and Execution
PPBS	Planning, Programming, and Budgeting System
QDA	Qualitative Data Analysis
R&D	Research and Development
RA	Reference Architecture
RDT&E	Research, Development, Test, and Evaluation
ROI	Return on Investment
S&T	Science and Technology
SAEs	Service Acquisition Executive
SDA	Space Development Agency
SECDEF	Secretary of Defense
SERC	Systems Engineering Research Center
SETA	Systems Engineering Technical Assistance
SME	Subject Matter Expert
SNCOs	Senior Non-Commissioned Officers
STEM	Science, Technology, Engineering, and Math
T&E	Testing and Evaluation
USD(R&E)	Under Secretary of Defense for Research and Engineering
VCJCS	Vice Chairman of the Joint Chiefs of Staff
WSARA	Weapon Systems Acquisition Reform Act
XML	Extensible Markup Language

ABSTRACT

This report provides the results of a Department of Defense (DoD) Planning, Programming, Budgeting, and Execution (PPBE) based literature search and review. The search identified a list of 144 sources (not including the 809 Panel recommendations and the National Security Commission on Artificial Intelligence). The research team reviewed the 809 Panel and the National Security Commission on Artificial Intelligence recommendations; however, we had insufficient resources to analyze these, electing to focus our analysis effort on the recommendations found in the other 144 sources. Of the 144 sources, ten (10) of these were identified as being primarily historical in nature, leaving 134 reports, podcasts, and articles of which the majority were published after January of 2021. After a concerted effort to "divide and conquer" to carefully review these sources, we decided to prioritize approximately half based on a quick review of the contents of the remaining articles as most pertinent. The full list of 134 reports and articles is available in Appendix A.

Our effort to extract PPBE improvement recommendations resulted in 262 of which some were simply observations or suggestions. The full list of 262 recommendations found in Appendix B includes a reference number to the source in Appendix A, a summary of the recommendations for brevity if warranted (copying the recommendation from the source was our preferred approach), and an actionability assessment of the recommendation. This assessment was reviewed by team members to determine if "the recommendation is understood and well-defined," noting that in some cases these recommendations may have already been implemented. This is understandable given that a number of these recommendations are dated. Hence, the reader should take this observation into context. This assessment left 222 recommendations for further analysis.

The results of qualitative data analysis suggest that a significant fraction (almost half) of the Pentagon's problems can be "self-corrected." We considered this to be our first finding despite the potential for the data to be biased towards familiarity with the PPBE process as most of the authors appeared to have backgrounds on the DoD side of these processes. Yet, there were several recommendations suggesting actions that can be unilaterally taken by Congress and several more in collaboration with the DoD to enact legislation in support of obtaining a responsive and agile PPBE process.

The Qualitative Data Analysis (QDA) also found several proposed actions to foster trust and transparency through modernized business systems, using, for example, real-time data analytics. As a result, we have included in this report two views of a reference architecture (RA) that once refined and agreed to by the stakeholders or by statute, should help achieve the desired result.

We also observed that the 809 Panel's Portfolio Management and Budgeting recommendation, Buy/Use Commercial Technology, and Flexibility (under Budgeting) were significantly repeated themes. Further, we observed a significant workforce theme including training and retention, among others.

It is worth noting that a concerted effort to cross check the recommendations found in the literature against existing and ongoing DoD initiatives has not been attempted. However, we are aware of initiatives such as the new Defense Civilian Training Corps (DCTC) among others that should be considered as satisfying several of the literature's recommendations.

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PPBE LITERATURE REVIEW

BACKGROUND

There has been a significant number of reports on, and opinion pieces about, the Department of Defense's (DoD's) Planning, Programming, Budgeting, and Execution (PPBE) process with a significant number contributed over the last few years. In the Fiscal Year 2022 (FY22) National Defense Authorization Act (NDAA) section 1004, Congress established an independent "Commission on Planning, Programming, Budgeting, and Execution Reform," with the following purpose:

> [...] is to–
>
> (1) examine the effectiveness of the planning, programming, budgeting, and execution process and adjacent practices of the Department of Defense, particularly with respect to facilitating defense modernization;
>
> (2) consider potential alternatives to such process and practices to maximize the ability of the Department of Defense to respond in a timely manner to current and future threats; and
>
> (3) make legislative and policy recommendations to improve such process and practices in order to field the operational capabilities necessary to outpace near-peer competitors, provide data and analytical insight, and support an integrated budget that is aligned with strategic defense objectives.[1]

Keeping in mind the stated purpose of the Commission, one of our early goals was to review the open literature for reports and opinion pieces containing explicit recommendations on how to improve the PPBE process. Sources that we identified but did not analyze include the 809 Panel's recommendations[2], the National Security Commission on Artificial Intelligence (NSCAI) recommendations[3], and literature whose purpose was to provide more of a general historical description of the reform efforts since first enacted as the Planning, Programming, and Budgeting System (PPBS) by McNamara in the 1960s (see G. Adams and C. Williams). This report provides the list of references we identified in our search, a summary of their recommendations, and our findings from an analysis of these sources.

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[1] Found at https://ppbereform.senate.gov/section1004-fy22-ndaa/

[2] Found at https://discover.dtic.mil/section-809-panel/

[3] Found at https://www.nscai.gov/wp-content/uploads/2021/03/Full-Report-Digital-1.pdf

OUR APPROACH

Below in the Phase 1 section, we describe the approach for first gathering the reports and opinion articles found in the open literature, and then extracting and summarizing the contents. Then in the Phase 2 section, we describe our method for analyzing those recommendations.

PHASE 1: LITERATURE IDENTIFICATION, RECOMMENDATION EXTRACTION, AND SUMMARIZATION

An initial list of potentially applicable PPBE reports, podcasts, and online opinion piece articles was identified from our experience working on various DoD related contracts. This list was expanded after the contract award through extensive Google searches and additional recommendations by Acquisition Innovation Research Center (AIRC) personnel working on this contract. The Google search (using various forms of PPBE, the PPBE phases, and acquisition reform to find reports and articles) focused on finding articles that were recent, within the last ~5 years; however, if Google provided a link to a report or article older than five years that seemed pertinent, it was also included. While we tried to be thorough, it is possible there are articles and reports that were missed. This search approach resulted in a list of 144 sources (not including the 809 Panel recommendations and the National Security Commission on Artificial Intelligence, as previously mentioned). The research team reviewed the 809 Panel and the National Security Commission on Artificial Intelligence recommendations; however we had insufficient resources to analyze these, electing to focus our analysis effort on the recommendations found in the other 144 sources. Of the 144 sources, ten (10) of these were identified as being primarily historical in nature, leaving 134 articles, podcasts, reports, and links to PPBE articles. After a concerted effort to "divide and conquer" to carefully review the 134 sources, we decided to prioritize less than half based on a quick review of the remaining articles as most pertinent. A list of the 134 reports and articles is available in Appendix A.

Even though our goal was to find open-source reports, articles, blogs, opinion pieces, and podcasts that were not older than 5 years, to minimize the possibility that recommendations had already been implemented, we show in Figure 1 the distribution of the source publication years.[4]

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[4] In the 134 sources, there were two for which we could not identify a published year. In these two cases, we simply list the years as either unknown or varied. Varied was used for a case where the source was a list of articles with a PPBE theme.

Figure 1. Distribution of Years for Identified Reports/Articles Published

Of note is the significant jump in published reports and articles in 2021 and 2022, where we only analyzed reports from 2023 prior to July. The significant increase after 2022 may be due to pending NDAA language that became law in December of 2021.[5] Note that we found several articles and podcasts trying to influence the Commission, where these typically included subject matter experts (SMEs) in various aspects of PPBE. In Figure 1, we truncated our analysis to articles prior to July of 2023; hence the total number represents sources from half the year.

Figure 2. Distribution of Months-Years for Recently Published Reports/Articles

[5] Found in Congress, FY22 NDAA Section 1004

Figure 2 displays the distribution of *recent* reports, podcasts, and articles by month. From the distribution, we see a significant increase in published articles starting in January of 2021. We speculate that DoD work to respond to the 809 Panel recommendations, other similar DoD work to address acquisition challenges, or maybe pending NDAA language regarding the establishment of a PPBE commission may be causes for this significant increase. Testing these hypotheses requires establishing the timing of DoD's public efforts, and when the NDAA language became known to these authors.

PHASE 2: LITERATURE ANALYTICAL METHODS

The primary focus of our review was to identify PPBE reform recommendations. The full list of 262 recommendations, and in some cases just observations or suggestions, is found in Appendix B with our subjective assessment on the actionability of each. This assessment was reviewed by another team member to determine whether "the recommendation is understood and well-defined," noting that in a few cases the recommendation may have already been implemented. This is understandable given that a number of these are dated. Note that in Appendix B we summarized several of the recommendations for brevity, however just copying the recommendation from the source was our preferred approach. This assessment leaves 222 recommendations for further analysis.

Nevertheless, we first attempted to use ChatGPT-3.5 and ChatGPT-4 from OpenAI to support our analysis of all these sources.[6] We found ChatGPT-3.5 was "hallucinating" results when pressed on certain topics. After we obtained a single-user ChatGPT-4 account, we found that it had significantly improved in this regard, however it could not do a satisfactory job at analyzing our large PDF files. Further, pasting large amounts of data into the prompt was too much for it to handle. We then tried to get ChatGPT-4 to identify categories for our qualitative data analysis, and an attempt to use these categories was made. However, these categories and sub-category coding themes were abandoned as several of the primary themes were also sub-category themes, resulting in significant confusion.

After ChatGPT-4 plugins became available, we tried to use several of the "PDF chat plugins" with some success. However, all the plugins had limitations when trying to analyze and then code all the recommendations. The most significant issues included getting ChatGPT to "stay on task," further we found that several plugins were unable to analyze our large volume of data. We eventually abandoned our attempt at using ChatGPT to analyze the larger volume of data for this report.

In parallel with the ChatGPT effort to ensure we accomplished the analysis, one of us reviewed the recommendations for most affected entity: *Congress*, the *Pentagon/Office of the Secretary of Defense (OSD)*, some *Other Decision Authority (DA)*, or some combination of these three. Figure 3 shows the result of this assessment.

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[6] ChatGPT is one of the popular Large Language Models (LLMs) that is available from OpenAI. The "OpenAI" name, the OpenAI logo, the "ChatGPT" and "GPT" brands, and other OpenAI trademarks are property of OpenAI. The contents of this research were written with ChatGPT version 4 as described. OpenAI's terms and policies can be found here: https://openai.com/policies, with terms of use found here: https://openai.com/policies/terms-of-use.

Figure 3. Recommendation's Affected Entity

We then attempted to identify the PPBE phase(s) affected by the various actionable recommendations. In several cases, the impacts on the PPBE phases were clear, however there are several recommendations where the impact on each of the phases was less clear, in which case the entire PPBE list was selected. Hence, the selection of phases impacted are somewhat subjective as the actual implementation details may result in less of an impact across the entire PPBE process. Figure 4 shows the results of this analysis.

Figure 4. Graph of Phase Combinations Affected by the Recommendations

Performing Qualitative Data Analysis (QDA)[7] on these recommendations leads to primary and secondary themes in Table 1 and Table 2, respectively. Secondary themes are tied to the primary themes through grouping. The *Others*… primary theme was a "catch all" gathering of areas where the primary theme didn't fit into the identified themes of *Budgeting*, *PPBE Commissioners Should*, *Workforce*, *Data Analytics & Metrics*, and *Transparency* and *Oversight*. It is important to note that in some cases a primary theme shows up in the secondary themes category. This occurs when a recommendation covers both subjects areas, and it becomes a subjective judgement call on which is the primary and which is the secondary theme.

The *PPBE Commissioners Should* theme is from papers, podcasts, and articles where the authors/contributors appear to want the commissioners to address various PPBE pain-point areas and discuss criteria for their desired outcomes. The reader can identify those media by tracing the reference numbers to the articles from the tables in the appendices.

Table 1. Primary Themes of Actionable Recommendations

Primary Themes	Frequency	%
Others...	80	36%
Budgeting	73	33%
PPBE Commissioners Should	28	13%
Workforce	17	8%
Data Analytics & Metrics	12	5%
Transparency and Oversight	12	5%

Appendix C contains a full list of the primary, secondary, and tertiary coding themes. Tertiary themes were the result of

[7] QDA is a method to extract themes from qualitative information to provide quantitative data. For additional information on QDA, see for example: https://en.wikipedia.org/wiki/Qualitative_research

Table 2. Leading Secondary Themes of Actionable Recommendations

Secondary Themes	Frequency	%
Portfolio Management and Budgeting	27	12.2%
Buy/Use Commercial Technology	10	4.5%
Flexibility	10	4.5%
Data Analytics & Metrics	9	4.1%
Training & Engagement	6	2.7%
Transparency and Oversight	5	2.3%
Accept Tension	3	1.4%
Align Work to Primary Mission	3	1.4%
Empower Senior Leadership Team	3	1.4%
Innovation & Funding	3	1.4%
National Service Programs	3	1.4%
PE Consolidation	3	1.4%
Analyze PPBE Processes	2	0.9%
Nontraditional Industrial Base	2	0.9%
Predictive Analytics	2	0.9%
Rapid Acquisition	2	0.9%
Revise Reprogramming Processes	2	0.9%
Use Agile Requirements	2	0.9%
Wishlist Awareness	2	0.9%

attempting to accumulate secondary themes into logical groupings of primary themes, such as *Budgeting*, and are provided for additional reference in the appendix. No attempt has been made to complete the coding of the tertiary themes category.

DISCUSSION

The results of Figure 3 suggest that a significant fraction (almost half) of the Pentagon's problems can be "self-corrected," thus we consider this to be our first finding. There may, however, be some underlying bias based on an inherent clustering of SMEs associated with writing these recommendations having worked in the PPBE process from within the OSD and Pentagon; without an analysis of the backgrounds of the authors and their contributors we cannot rule this out. Yet, there were several recommendations suggesting actions that can be unilaterally taken by Congress or in collaboration with the DoD in support of obtaining a responsive and agile PPBE process.

From the QDA of the recommendations in Tables 1 and 2, we noted that there were several proposed actions to foster trust and transparency through modernized business systems, using, for example, real-time data analytics. On the following page are two figures (5 and 6) depicting the modern, digitally enabled acquisition program's data and models.

Figure 5 is a notional reference architecture of an integrated modeling environment showing the interacting processes, models, and data in a modern digital engineering ecosystem supporting a weapon system's acquisition. Figure 6 reorients this notional reference architecture to show the data flowing to various external stakeholders.

These figures can be used as a starting point to discuss the data needs of the various external stakeholders. It is presumed that the realized (actual) cost and schedule data (earned value management (EVM) with performance against the integrated master plan (IMP) and integrated master schedule (IMS)) are the primary information that external stakeholders (e.g., Congressional staffers) would need. In a modern digital acquisition, we should only have to identify the type, format, periodicity, and integrity assurances of the data that is required for Congress to fulfil its oversight role. Once identified, a proper mixture of policy and statute can support the visibility needed.

integrated modeling environment (IME)

Figure 5. View of a Reference Architecture for an IME in support of Digital Engineering

Figure 6. View of a Reference Architecture for a Digital Acquisition

Referring to the recommendations in Tables 1 and 2, we observe that the 809 Panel's Portfolio Management and Budgeting recommendation, Buy/Use Commercial Technology, and Flexibility (under Budgeting) were significantly repeated themes, as were various workforce themes including training and retention.

No effort has been made to cross-check the recommendations found in the literature against existing DoD efforts to implement them. We are, however, aware of DoD initiatives to implement 809 panel recommendations, and the Defense Civilian Training Corps (DCTC)[8] where AIRC staff are supporting research.

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[8] See https://dctc.mil/ for more information on the DCTC initiative.

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APPENDIX A. REVIEWED LITERATURE

This appendix contains a table consisting of the full list of reviewed literature used for the analysis contained in this report.

Table A-1. Reviewed Literature Articles

ID#	Author(s)	Title (with link to the report/article on the web)	Date Published
RL1	T. Bounds	Defense Acquisition and Acquisition Reform: A Study	5/1/19
RL2	E. Lofgren, W.M. McNamara, and P. Modiglianai	Commission on Defense Innovation Adoption: Interim Report	4/1/23
RL3	E. McCusker	Reforming Defense Budgeting	3/1/23
RL4	PPBE Reform Commission	COMMISSION ON PLANNING, PROGRAMMING, BUDGETING, AND EXECUTION REFORM: Status Update	3/1/23
RL5	J. Martin (Decision Lens)	PPBE Commission Recommendation: Congress should require the DoD to utilize scenario-based prioritization budgeting tools	7/1/22
RL6	J. Etherton, C. Evans, N. Jones, R. Mccaffrey, R. Van Steenburg, and J. Winn	Stepping Back from Acquisition Reform: How Our Resourcing Processes Drive Defense Outcomes	1/1/22
RL7	F. Bartels, J.E. Whitley, W. Greenwalt, and C. Cook	How to Reform DOD's PPBE Process	The Heritage Foundation, panel discussion available on YouTube	3/1/22
RL8	E. Lofgren	The DoD Budget Process: The Next Frontier of Acquisition Reform	7/1/20
RL9	E. Lofgren	Pathways to Defense Budget Reform	4/1/22
RL10	E. Lofgren	PPBE Reform	Acquisition Talk	7/15/05
RL11	T. Devine	Partnership: The Key to PPBE Reform	Unknown
RL12	M. Blacketer	NCMA and ASMC Collaborate to Support PPBE Reform (ncmahq.org)	5/1/22

RL13	M. Conlin, Definitive Logic	Michael Conlin, newly appointed Chairman of the PPBE Reform Task Force, sits down with Rich Brady CEO of ASMC	7/14/05
RL14	J. Edwards	ASMC PPBE Reform Task Force OKs Work Plan at Inaugural Meeting; Michael Conlin Quoted	7/1/22
RL15	E. McCusker	AEI_FDP Working Paper McCusker Reforming Defense Budgeting	3/1/23
RL16	J. McGinn	GovCon Expert Jerry McGinn: Commission on PPBE Presents Opportunity for DoD to Match Commercial Industry's Innovations	1/1/22
RL17	J. McGinn and E. Lofgren	Three steps to help defense innovation break free from its shackles	1/1/22
RL18	Guidehouse	Reforming the Department of Defense Strategy, Planning, Programming, Budgeting and Execution System	5/1/22
RL19	K. Yourish and L. Stanton (Washington Post)	A guide to the federal budget process	1/1/10
RL20	J.P. Wong (RAND)	Bad Idea: Looking for Easy Solutions for PPBE Reform	3/1/23
RL21	G. Adams and C. Williams	Buying National Security: How America Plans and Pays for Its Global Role and Safety at Home	12/1/09
RL22	Army AL&T Magazine	Understanding Acquisition: The Valley of Death	9/1/21
RL23	T. Foster	This Startup Learned the Hard Way What It's Like to Work With the Pentagon: What happens when a wildly ambitious young startup decides to work with the military? It's complicated	6/1/19
RL24	J. Serbu	Pentagon's ponderous budget process is next target for Congressional reform	12/1/21
RL25	J.P. Wong (RAND)	Resourcing Defense Innovation: The role of organizational values	5/1/22
RL26	T. Harrison and S.P. Daniels	Analysis of the FY 2020 Defense Budget and Its Implications for FY 2021 and Beyond	2/1/20
RL27	J.P. Wong (RAND)	Balancing Immediate and Long-Term Defense Investments	4/1/16

RL28	M. MacGregor, G. Grant, and P. Modigliani (MITRE)	[Five First Steps to a Modern Defense Budgeting System](#)	8/1/22
RL29	M. MacGregor, P. Modigliani, and G. Grant (MITRE)	[Pillars of the Modern Defense Budgeting System](#)	2/1/22
RL30	E. Lofgren	[PPBE reform event: an imperative for winning the great power competition](#)	3/1/21
RL31	J. Serbu	[Fixing DoD's broken budgeting system a big reform topic for 2023](#)	11/1/22
RL32	J. Gledhill	[If Congress Wanted to, It Could: Improve Acquisition Now](#)	4/1/23
RL33	Breaking Defense Links	[Planning Programming Budgeting & Execution (PPBE)](#)	Various
RL34	S.S. Muchow	[Defense Acquisition: Ready for Reform?](#)	3/1/13
RL35	W. McHenry and M. Brown	[The 1960s had Their Day: Changing DoD's Acquisition Processes and Structures](#)	12/5/22
RL36	E. McCusker	[Another Continuing Resolution? The Enemy Is Us](#)	12/1/22
RL37	J. Edwards	[ASMC PPBE Reform Task Force OKs Work Plan at Inaugural Meeting; Michael Conlin Quoted](#)	7/1/22
RL38	E. Chase	[BREAKING THE CYCLE OF INCREMENTAL ACQUISITION REFORM](#)	3/1/23
RL39	E. McCusker	[Defense Funding—Highlights from FY 2023 to Inform FY 2024](#)	1/1/23
RL40	Decision Lens	[Six Guiding Principles of a Next-Generation Defense Budget System](#)	5/1/23
RL41	M. Langston	[Effective DoD Acquisition Needs Less Noise! ...Part 1](#)	1/1/19
RL42	M. Langston	[Effective DoD Acquisition Needs Less Noise! ... Part 2](#)	3/1/19

RL43	J. S. Gansler and W. Lucyshyn	Eight Actions to Improve Defense Acquisition	12/12/13
RL44	E. McCusker and D. Patt	Faster Weapon Buys: Try Evolutionary Innovation	7/1/21
RL45	GAO	DOD Is Taking Steps to Address Challenges Faced by Certain Companies	7/1/17
RL46	GAO	Additional Actions Needed to Implement Proposed Improvements to Congressional Reporting	2/28/22
RL47	W. C. Greenwalt and D. Patt	Competing in Time: Ensuring Capability Advantage and Mission Success Through Adaptable Resource Allocation	2/1/21
RL48	A. Eversden	Lawmakers name familiar faces in defense to budgeting reform commission	2/1/22
RL49	R. Lewis et al.	Acquisition Reform Regimes on Their Own Terms: Context, Mechanisms, Effects, and Space Program Impact	2/1/19
RL50	E. McCusker and E. Coletta	Matching Defense Budget to Strategy	2/9/23
RL51	M. Langston	My Mistake — Congress has Already Enabled DoD "Speed to Capability"	8/12/17
RL52	M. Langston	Navy Acquisition Can Easily Be Fixed	5/21/18
RL53	T. Hitchens	New NDIA Spin-Off Focuses On Building Next-Gen Tech Base For DoD	7/26/21
RL54	Ronald Reagan Foundation	National Security Innovation Base Report Card	3/1/23
RL55	E. Lofgren	PPBE reform event: an imperative for winning the great power competition (link to 2 Part Webinar on Increasing Speed and Flexibility in DoD Budgeting)	3/23/21
RL56	M. D. Watkins and M. H. Bazerman	Predictable Surprises: The Disasters You Should Have Seen Coming	4/1/03

RL57	P. Anton, et al.	Strategies for Acquisition Agility: Approaches for Speeding Delivery of Defense Capabilities	8/27/20
RL58	P. Anton	AIRC Research Report: Thoughts on Agility Through Appropriations: "IF BA-8 Is Successful, What Next?"	10/1/22
RL59	J. P. Wong	Resourcing Defense Innovation: The role of organizational values	5/2/22
RL60	S. Pettyjohn	Russia's War on Ukraine, China's Rise Expose US Military Failings	2/21/23
RL61	E. McCusker and G. Ferrari	The Defense Policy Turducken	12/9/22
RL62	E. McCusker	The Enemy is Us, Again?	1/19/23
RL63	D. S. Zakheim	The Holy Grail of Defense Reform: The elusive quest to fix the Pentagon's broken acquisition system	7/11/16
RL64	M. Langston	Time to Fix DoD Acquisition and Ensure Cybersecurity!	11/23/16
RL65	T. Hitchens	To Aid Digital Transformation, Army Eyes 'One Cloud' And Faster Acquisition	10/13/21
RL66	Breaking Defense	What DoD needs to make JADC2 a reality is Live, Virtual, and Constructive	3/8/23
RL67	Federation of American Scientists	Next-Generation Defense Budgeting Project	4/21/23
RL68	K. Hicks	Deputy Secretary of Defense Kathleen Hicks Keynote Address at the Ash Carter Exchange on Innovation and National Security (As Delivered)	5/1/23
RL69	J. Whitley	Three Reforms to Improve Defense Resource Management	6/1/22
RL70	E. McCusker and D. Patt	Modernizing the Military May Require Modernized Oversight	4/27/22
RL71	R. Gevalt	FEAR NOT THE DEMISE OF VENTURE CAPITAL FUNDING FOR DEFENSE	5/3/22

RL72	J. Whitley	Digital transformation is a key to maintaining US overmatch against China, Russia	5/18/22
RL73	T. Temin	Data visibility, granularity, accuracy are keys to better PPBE	4/25/22
RL74	T. Temin	How The Army Will Balance Contingency and Long-Term Needs	4/19/22
RL75	F. Bartels	Persistent Knowledge Gaps in the Chinese Defense Budget	4/14/22
RL76	Definitive Logic	An open letter to the PPBE Reform Commission	4/4/22
RL77	M. Vallone	Budget Reform Can't Succeed Without Congress	4/6/22
RL78	The Heritage Foundation, F. Bartels	Improving Defense Resourcing: Recommendations for the Commission on Planning, Programming, Budgeting, and Execution Reform	3/24/22
RL79	T. Temin	Navy executive: DoD budget process must keep up with real needs	3/22/22
RL80	P. Modigliani (MITRE)	The Program Side of the Valley of Death	3/17/22
RL81	C. Grassley	Grassley Pushes For Financial Management Oversight At Department Of Defense	3/15/22
RL82	M. Pomerleau	Cyber Command Prepares to Gain Significant Budget Control	3/14/22
RL83	M. MacGregor, P. Modigliani, and G. Grant (MITRE)	Pentagon needs a six-pillar foundation	3/7/22
RL84	T. Temin	Defense Innovation Bumps Up Against a Cold War Budget System	2/22/22
RL85	J. McGinn and E. Lofgren	Acquisition Next: A Playbook to Break Industrial Age Shackles	2/8/22
RL86	T. Spoehr and F. Bartles	REFORMING THE DEFENSE DEPARTMENT'S PLANNING, PROGRAMMING, BUDGETING, AND EXECUTION PROCESS	1/13/22
RL87	R. Marks	Desperately needed: 21st Century DOD budget process	1/10/22

RL88	B. Vincent	[2022 Defense Authorization Bill (Once Again) Looks to Reform How DOD Buys Tech](#)	12/29/21
RL89	W. Greenwalt	[New Defense Budget Commission Could Be Last Hope for Fixing DoD Spending](#)	12/13/21
RL90	P. Modigliani (MITRE)	[Bad Idea: Managing Defense Requirements, Budgets, And Acquisitions Via Programs](#)	12/10/21
RL91	L. C. Williams	[Why DoD Is So Bad at Buying Software](#)	11/8/21
RL92	R. Hale	[Financing the Fight: History and Assessment of DoD Budget Execution Processes](#)	11/2/21
RL93	F. Bartels, The Heritage Foundation	[Cumbersome Defense Reprogramming Process Hampers National Defense and Should be Streamlined](#)	10/31/21
RL94	R. Fedasiuk, J. Melot & B. Murphy, Center for Security and Emerging Technology	[Harnessed Lightning: How the Chinese Military is Adopting Artificial Intelligence](#)	10/1/21
RL95	J. Whitley and G. Pejic	[Senate Commission to Fix Defense Budgeting Is Right on The Mark](#)	9/24/21
RL96	J. Matuschak	[Presentation Is Key: Why the Pentagon's Budget Data Needs a Makeover](#)	9/23/21
RL97	S. Soloway and J. Knudson	[Is It Time for OTAs to Go Mainstream?](#)	9/1/21
RL98	Government Matters	[Defense Budgeting System Hinders Rapid Acquisition of Commercial Technology, Says Procurement Researcher](#)	8/4/21
RL99	N. Strout	[The Space Force Wants to Manage Acquisitions by Portfolio](#)	8/4/21
RL100	S. Soloway, J. Knudson, and V. Wroble	[Other Transactions Authorities: After 60 Years, Hitting Their Stride or Hitting the Wall](#)	8/4/21
RL101	J. Gill	[Lawmaker Proposes Restructuring Funding Through Mission-Based Pilot](#)	7/28/21

RL102	M. Lewis and A. Shaffer	The Modernization Quandary	7/26/21
RL103	GAO	COVID-19 Contracting: Actions Needed to Enhance Transparency and Oversight of Selected Awards	7/26/21
RL104	L. C. Williams	Senate NDAA Pushes for More Domestic Production, Increased Cyber Authorities	7/23/21
RL105	L. C. Williams	Can JADC2 Fly Without Budget Reform	7/21/21
RL106	J. Gill	Former Modernization Official Says DoD 'Optimized for Fairness,' Not Speed	7/21/21
RL107	HASC	Full Committee Hearing: "Non-Governmental Views on The Fiscal Year 2022 Department of Defense Budget"	7/20/21
RL108	National Security Commission on AI	How Congress Must Reform Its Budget Process to Compete Against China In AI	6/25/21
RL109	F. Bartels, The Heritage Foundation	Changing Current "Use It or Lose It" Policy Would Result in More Effective Use of Defense Dollars	6/23/21
RL110	S. Freedberg, Jr.	Hicks Seeks To Unify Service Experiments With New 'Raider' Fund	6/21/21
RL111	J. Serbu	Pentagon Wants to Use Its Biggest It Program to Test 'Colorless' Software Appropriation	5/31/21
RL112	H. Carlisle	It's Time for A Fresh Look at Resourcing Defense, National Defense	5/21/21
RL113	D. Ward, M. MacGregor, and P. Modigliani	Five by Five: Five Disciplines and Five Strategic Initiatives for the Pentagon in the Digital Age	5/12/21
RL114	D. Zakheim	Reform The Pentagon's Budget Process, Or Lose Our Military and Tech Advantages	4/2/21
RL115	E. Lofgren and M. MacGregor	A Bridge Fund Can't Solve the Pentagon's Emerging Tech Problem	3/15/21

RL116	Senate Armed Services Committee (SASC) hearing	Emerging Technologies and Their Impact on National Security	2/23/21
RL117	B. Clark and D. Pratt	The Pentagon Needs Budget Agility to Compete with China	2/12/21
RL118	S. Blank, R. Shah, and J. Felter	Pentagon Advisory Boards Need to Offer 10x Ideas, not 10% Ones	1/30/21
RL119	E. McCusker	Former Pentagon Comptroller: Observation and Opportunities for America's Defense Budget	1/11/21
RL120	R. Hale	Bad Idea: The "Use-It-Or-Lose-It" Law for DoD Spending	12/15/20
RL121	R. McCormick	Department of Defense Other Transaction Authority Trends: A New R&D Funding Paradigm?	12/8/20
RL122	Future of Defense Task Force	Future of Defense Task Force Report 2020	9/23/20
RL123	Future of Defense Task Force	Future of Defense Task Force: Report on Implementation	3/15/22
RL124	M. Flournoy and G. Chefitz	Sharpening The U.S. Military's Edge: Critical Steps for The Next Administration	7/13/20
RL125	Defense Innovation Board (DIB)	DIB "Software is Never Done" Study Report	5/3/19
RL126	M. Shevin-Coetzee	The Labyrinth Within: Reforming the Pentagon's Budgeting Process	2/3/16
RL127	GAO	Weapon System Acquisitions: Opportunities Exist to Improve the Department of Defense's Portfolio Management	9/27/15
RL128	D. Pearson	The Fast Follower, Coming Up Behind Development Leaders	6/1/15
RL129	GAO	DOD Should Streamline Its Decision-Making Process for Weapon Systems to Reduce Inefficiencies	2/1/15

RL130	GAO	[Best Practices: An Integrated Portfolio Management Approach to Weapon System Investments Could Improve DoD's Acquisition Outcomes]	3/30/07
RL131	E. Lofgren, J. McGinn, and L. Everhart	[Execution Flexibility and Bridging the Valley of Death AN ACQUSITION NEXT REPORT]	10/1/22
RL132	G. F. Decker and L. C. Wagner, Jr.	[Army Strong: Equipped, Trained and Ready. Final Report of the 2010 Army Acquisition Review]	1/1/11
RL133	GAO	[Research and Development: DOD Benefited from Financial Flexibilities but Could Do More to Maximize Their Use]	6/1/23
RL134	S. Blume and M. Parrish	[Make Good Choices, DoD: Optimizing Core Decisionmaking Processes for Great-Power Competition]	11/20/19

APPENDIX B. LIST OF IDENTIFIED RECOMMENDATIONS AND ACTIONABILITY

This appendix contains the list of extracted recommendations from the reviewed literature. Where the recommendation identified was lengthy, we summarized for length. The reader should refer to the original article for accuracy using the links provided in Appendix A. We reviewed the list to determine if these recommendations appear actionable.

Table B-1. Summarized Recommendations with Actionable Determination

#	Ref ID	Ref #	Recommendation made:	Actionable?
1	RL1	1.1	References 809 Panel's recommendation: **Increased use of commercial products:** "Central to the improvement of the procurement arm of Department Acquisition reform is a realignment towards commercial products and related procurement activities. Because many departmentally necessary products already exist in the commercial space, the Panel recommends dividing all procurements into three types: readily available, available with modifications, and completely unique. This general shift towards purchase of already-existing solutions and technologies prevents the "reinventing the wheel" mentality that sometimes pervades Acquisition, and which drives significant and unnecessary cost growth."	**Yes**
2	RL1	1.2	References RAND (2018) Arena et al. "Assessing Bid Protests…" for delays causes & 809 Panel's proposal: **Limits on Protest:** "Bid protests are an ever-present element of most major Acquisition decisions, especially when the government down selects at the Analysis of Alternatives phase. In the time period from FY 2008 to FY 2016, contractors made over 11,000 bid protests, delaying program development and costing the government the time and expense needed to adjudicate. Section 809 proposals would limit the filing of bid protests to the Department itself, rather than the Government Accountability Office or Court of Federal Claims. Finally, the Department would be more empowered to rely upon market research in adjudicating claims, rather than making internal judgments without a guiding framework."	**No**
3	RL1	1.3	References 809 Panel's recommendation: **Portfolio Management**: "Finally, the Panel recommended a "Portfolio Management" approach to Defense Acquisition. Rather than breaking up authority into discrete program categories, the Panel recommended empowering PEOs to oversee a collection of related capabilities, grouped into portfolios. The realignment would also allow PEOs to operate with command authority over their programs and PMs. It is believed that this approach would streamline related process activities and locate power with those parties directly responsible for Acquisition systems in development."	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
4	RL2	2.1	**Introduce a new capability portfolio model**: The DoD and Congress empower and resource five Program Executive Officers (PEOs) to operate via a new capability portfolio model in 2024.	Yes
5	RL2	2.2	**Consolidate program elements**: Acquisition executives propose consolidated program elements to congressional staff and negotiate what can be included in the Fiscal Year (FY) 2024 Appropriations Act joint explanatory statement.	Yes
6	RL2	2.3	**Reset reprogramming authorities**: Congressional appropriations committees reset reprogramming authorities to historical norms in their FY 2024 joint explanatory statements.	Yes
7	RL2	2.4	**Modernize the DoD to align with the twenty-first century industrial base**: Congress directs DoD to elevate the Defense Innovation Unit (DIU) to a direct report to DepSecDef and resource it effectively to align and harness the nontraditional defense industrial base for the twenty-first century no later than six months after the enactment of this act.	Yes
8	RL2	2.5	**Strengthen alignment of capital markets to defense outcomes**: Strengthen existing capital market programs and create new pathways for mission-critical technologies.	Yes
9	RL2	2.6	**Incentivize tech companies to do business with the DoD**: Congress, OSD, and SAEs increase incentives and reduce barriers for leading technology companies to do business with the DoD by September 2024.	Yes
10	RL2	2.7	**Modernize budget documents**: USD comptroller proposes streamlined budget justification and chief digital and artificial intelligence officer (CDAO) modernizes supporting details in congressionally accessible information system for the President's FY 2026 budget request.	Yes
11	RL2	2.8	**Establish bridge fund for successfully demonstrated technologies**: Tying Experimentation to Acquisition Outcomes: Scaling and Accelerating Successful Demonstrations	Yes
12	RL2	2.9	**Scale the Space Development Agency Model**: USD(A&S) and acquisition executives propose realigning existing organizations to adopt the Space Development Agency (SDA) model, and Congress grants additional enabling authorities to those organizations in FY25 NDAA.	Yes

#	Ref ID	Ref #	Recommendation made:	Actionable?
13	RL2	2.10	**Modernize the DoD's requirements system**: VCJCS and services establish a team to collaboratively modernize JCIDS and service requirements processes by September 2024.	Yes
14	RL3	3.1	The author argues that "Defense Non-Core Competencies" distract resources and attention from programs and do not produce capability, and these need to be moved out of the DoD. Her point (made in the paper), "For example, spending for most pay expenses including health care and compensation and benefits could be treated as entitlement funding and moved to a separate budget."	Yes
15	RL3	3.2	The author also argues that in addition to removing those non-mission core funding, federal domestic spending to support the nation's security should be prioritized.	Yes
16	RL3	3.3	Further, since the budget is not structured to adapt and be responsive to strategic priorities or answer key management and oversight questions, it should be modified and updated to do so.	Yes
17	RL5	5.1	Require budget scenario tools to understand and prioritize potential spending impacts resulting from changing world events and unexpected innovation.	Yes
18	RL6	6.1	The acquisition reform conversation's limited scope prevents analysts, decision-makers, and reformers from gaining a full picture of all factors contributing to disappointing defense acquisition outcomes. Hence, the recommendation could be adapted from this to create a longer-term forum for an expanded scope that provides analysts, decision-makers, and reformers to obtain a fuller picture of the factors contributing to defense acquisition outcomes (positive and negative).	Yes
19	RL6	6.2	The budgeting and appropriations processes impose constraints and restraints on the acquisition system in ways that produce powerful incentives and disincentives for defense resourcing stakeholders. Hence, there is a need for stakeholders and other analysts to **step back and evaluate the programming, budgeting, and execution components of the PPBE processes and how they impact acquisition, with a particular focus on the positive and negative behaviors and externalities that resourcing processes produce.**	Yes

#	Ref ID	Ref #	Recommendation made:	Actionable?
20	RL6	6.3	Congress translates the public's will into budget authority for defense policies and programs, and in response, other institutional actors within the planning, programing, budget, and execution system adapt their behavior to successfully navigate current and future rounds of budgeting and appropriations to ensure successful programming and execution.	N/A
21	RL6	6.4	The reality of [6.3] yields significant consequences — some highly effective and some counterproductive — for managing cost growth, schedule slippage, and program performance. Examples of these consequences include the flexibility constraints that congressional time requirements (a "use it or lose it" requirement for funding) impose on the executive branch, as well as full funding requirements that incentivize agencies to over-purchase capabilities up-front. (This reality is discussed by the Atlantic Research Council panel in RL7's recommendations as well.)	N/A
22	RL6	6.5	Different stakeholders have missions and requirements that define their priorities in ways that may compete with other stakeholder requirements.	N/A
23	RL6	6.6	DoD's 5–7-year programming process does not provide the flexibility to fund new programs or support the funding of emerging/new technologies without significant topline increases or reducing or eliminating the budgets of the longer-term programs. Resource trades (and I'll take this as both money, people, materials, etc.) simply are not happening.	No
24	RL6	6.7	Because acquisition reform depends on effective resourcing processes, policies, and decisions, the NDIA believes that understanding these processes [here let's assume the overall process] is a key first step in shaping decisions to prioritize the right capabilities for national security.	Yes
25	RL6	6.8	The final bullet in the executive summary states: "In the hopes of producing more desirable outcomes such as cost-savings and innovation, NDIA will release a follow-on paper in 2022 which will evaluate achievable policy recommendations that can help re-align incentives and disincentives." However, at the end of the introduction it states: "To ensure that we achieve our goal to provide clarity on the process, **we have refrained from making recommendations**. Instead, in the pages below, we hope to explain, document, and explore the incentives and disincentives for defense acquisition stakeholders that the current resourcing system creates in defense programming and execution noting significant consequences for managing the cost, schedule, and performance of acquisition programs. We invite others to build on this descriptive analysis with further analysis and recommendations of their own."	N/A

#	Ref ID	Ref #	Recommendation made:	Actionable?
26	**RL6**	6.9	Looking in the report, for example we find the observation that there are four significant characteristics of developing a FYDP that make it difficult to "agilely resource emerging capabilities: (1) time horizon differences, (2) total lifecycle costs, (3) trades versus new funding, and (4) trust."	**N/A**
27	**RL7**	7.1	The one thing the PPBE Reform Commission needs to fix for a passing grade is the planning process and in particular the lack of a strategic analytic framework to inform the planning process. Especially when you have a significant change in direction, for example in moving from counterterrorism to again competing with near-peer competitors such as China and Russia.	**Yes**
28	**RL7**	7.2	The one thing the PPBE Reform Commission needs to fix for a passing grade is the need for speed and agility to compete against a near peer competitor. From that, the key thing we must look at in designing a new process is how it will work in that competitive field. Hence, process modeling.	**Yes**
29	**RL7**	7.3	Current processes are optimized for a competitor who has linear-centralized thinking and management structure, and we need to somehow adopt that for the Chinese. Chinese are doing civil-military integration and so its critical for us to integrate new non-traditional companies who are able to innovate on behalf of the Dept.	**Yes**
30	**RL7**	7.4	The greatest opportunity is with the execution side and accounting and reporting, as we're finding that data analytics and AI provides a ton of information that carries through the system. All the way from the beginning part with the program elements that CAPE uses and their decades of information on weapon systems. The key point is the feedback mechanism back into the beginning of the process from the execution phase. "It starts to break down in the transfer programming phase where they run into resource constraints, then the budgeting phase where you get the detail at the smallest level." "Its all about trade-offs. There's never enough money. So how do you make the least bad-decision of the day. Its all about managing risks, and the whole enterprise risk management is the emerging approach to how we serve the nation."	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
31	**RL7**	7.5	On the question of what to preserve in the existing system, he indicates the "predictive" part as best as possible where changes or if you are wrong in your predictions will not have grave national security impacts. Then figure out how to worry about in-year execution to address the changes in technology and how to be okay with a lot of failure in the innovation process.	**Yes**
32	**RL7**	7.6	Touching on [7.5], PPBE commission needs to change timing and sequencing and the broad structure of an enduring strategy that you then try to translate into capability needs for structure and posture. Then translate that into programmatic priorities that you then build out into a budget to find those programs. He suspects that most of this will stay intact.	**Yes**
33	**RL7**	7.7	Keeping in mind that making decisions at the senior leadership level is incredibly hard in the context of [7.6]. You don't always know the consequences and implications of a decision and you have to deal with competing interests and challenges of stakeholders both within and outside the Department. Sometimes decisions are done in a way to lead to another round of decisions by getting more information from analysis to enable a secretary to make a tough decision. He suspects that will stay in place.	**No**
34	**RL7**	7.8	Points out that the current PPBE does allow for congressional pork barreling to ensure money is flowing into your district. "PPBE is the worst form of resource allocation except for all the rest." "The bones of the PPBE structure are very very strong ..." except when budget decisions get delayed in any part of the process, the delays roll down to the next step in the process and chaos ensues because you don't have enough resources to do everything, especially as an OSD comptroller. When the budget doesn't work at the last minute its like having a beautiful ice sculpture and you start whacking away at it with a sledgehammer because you don't have enough water from OMB. The PPBE commission needs to ask the question, if its such a good process why is it not found anywhere else in the world?	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
35	**RL7**	7.9	On the question of "many of the proposed reforms require congress to give up some of its oversight power. What should congressional oversight look like and are there any confidence building measures that the DoD should do to help change congressional oversight?" A: There should be real-time transparency in the data systems to congress. What type of transparency is necessary to achieve the proper oversight for congressional staff in exchange for "pots of flexibility"? Better information flow and data so '… that everyone can access so we're all on the same sheet of paper.' Dept has tried that in the past, but they've never quite achieved the transparency in real-time data.	**Yes**
36	**RL7**	7.10	There's a challenge in the executive branch's ability to respond to crises, and the constitutional prerogatives given to congress that are long-standing and institutionalized in law. Everyone agrees that this is a messy-messy process but there are those foundational pillars that you have to consider. In the data transparency approach, knowing how much money is left on the table that you're eventually going to have to give up is something they think the members would like to see such that they can give the Department the flexibility to fund other things in their districts. Pointing out that ~$20B is left on the table each year, it doesn't make sense that the data isn't flowing back such that congress is acting to recolor that money or make it more flexible. Currently it eventually expires and then is cancelled so that the dept. never sees that purchasing power.	**Yes**
37	**RL7**	7.11	Follow up on disconnects in the process from planning to programming from execution reviews and then how execution reviews feed back into planning. Respondent indicates it is a matter of starting the process speaking in one language and by the time you're at the end you are talking in a completely different language … and that we simply have not figured out how to do the reverse translation to feed the lessons learned back into the early part of the process. How do you communicate the conceptual translation of real-world events and what "may" happen as it goes from programmers and the budgeteers to the accountants down the line, then bring that forward to make it relevant?	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
38	**RL7**	7.12	Real world example from CAPE was at the start of the pandemic of shutting down basic training. Public health simulation models indicated that they'd lose lots of soldiers if they didn't, whereas in the real world they had two outbreaks, and both had been stopped at 40 cases. Simulation analysis was completely disconnected from the ground truth. The individual believes that they need more statisticians and econometricians in the key analytic offices. The example they provided for the commission to look at was that ODNI has a formal retrospective program evaluation process that feeds back into the models. Cost estimation failed on the SpaceX example where they delivered capability at 10x less than what they had estimated. In short … **they need to add and formalize a retrospective program evaluation process that feeds real world data back into the models.**	**Yes**
39	**RL7**	7.13	If you're doing something new, you're not going to have the performance data to baseline against and support your decisions. You are having to take a risk on the decision. There are many areas where the process can be sped up or even have reduced elements that are redundant. The main challenges to speed: is it a matter of congress appropriating faster, or is it a matter of taking away the 6-months-for-programming step to where they only have two months?	**N/A**
40	**RL7**	7.14	Neither of these changes would speed adoption of technology, but they can be enablers. So, for example, do we rent technologies where other renters in that market support refreshing the technology in real-time?	**Yes**
41	**RL7**	7.15	Changing business model to support digital transformation where the product development life cycle supports the development of simulation models that allow more iterations faster in less time, allowing for the customization of the product to the customer's needs. Follow that with a digital thread into digital manufacturing with robotic additive manufacturing.	**Yes**
42	**RL7**	7.16	From the accounting perspective, the question is how to become auditable and drive more accountability into the business processes. There will always be variations, for example buying things as a service or renting them like the cloud.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
43	RL7	7.17	How do you build easy pass lanes around the longer 5000 acquisition processes for things where you need to go fast? Where do you force things down a 5-year cycle to the point where you're looking at a transition fund of some sort to getting around the valley of death where there are like 4 or 5 of those unless you can plan perfectly?	No
44	RL7	7.18	Another concept is being able to understand when the predictive analysis is likely to be correct and when it's likely not going to be, for example due to complexity and the abstraction to less fidelity of those analytical models or lack of incorporation of black swan events. The commentators also discussed additional pathways for the SECDEF or DEPSECDEF to be presented. They indicated it was a philosophical debate in the use of Operations Research (OR) in WWI, and WWII for near term problems; now that has transitioned into systems analysis and research trying to predict things that couldn't be predicted, and then today's world where innovation is coming from completely outside the Department and the defense industry.	Yes
45	RL7	7.19	Big take aways on the PPBE Reform Commission's success criteria are (1) the lack of strategic analysis to inform the planning process, (2) the speed and agility of acquisition and our ability to adopt technology and fuel technology at the speed of relevance on our problems and execution, and (3) the ability to bring back realized performance data to inform upstream decisions.	Yes
46	RL7	7.20	Big take aways on the PPBE Reform Commission's failure criteria are (1) they weren't bold enough in their large-scale strategic thinking, (2) they weren't tactical and actually go down and write the actionable changes that are necessary in law regulation and policy, and (3) they lacked the energy to push through the changes because they were very hard to do as it will take a lot to change the system.	N/A
47	RL8	8.1	Concludes that, for policymakers to provide program flexibilities through the budget, there will have to be additional reporting mechanisms to keep policymakers informed about where the funding actually went, how the programs performed in test and operations, and what roadmaps are in place, i.e., program analysis and cost-effectiveness will remain important but will not be married to the budget process.	Yes
48	RL8	8.2	Tie budget line items to major organizations rather than programs. Provide congress with a mechanism to rigorously check up on what actually happened, tightening the feedback cycle of accountability.	Yes

#	Ref ID	Ref #	Recommendation made:	Actionable?
49	**RL8**	8.3	By delegating authority, emphasizing speed, and measuring real value rather than predicted value, policymakers can better pinpoint responsibility and provide rewards or punishment depending on the outcomes.	**Yes**
50	**RL9**	9.1	Concludes that execution flexibility in the form of portfolio budgeting is not only consistent with economic efficiency, but that it is also consistent with United States traditions of congressional control. He points out that "Large technology companies no longer budget to specific projects; they budget to persistent development teams that are empowered to make cost, schedule, technical trades throughout. If the Department of Defense wants to compete against peer adversaries and do business with the most innovative commercial companies, greater execution flexibility in the form of portfolio budgets are required. A precondition to that flexibility, however, is value-driven methods of reporting and oversight."	**Yes**
51	**RL9**	9.2	Quotes Representative Seth Moulton from 2021, "The truth of the matter is that the current system doesn't really give us the oversight we need. We're sort of circling the drain with this system where DoD describes in intricate detail the ways that it isn't buying effectively, Congress signs off on that oversight, and we just keep going in circles… As a member of Congress, I can keep DoD accountable by asking that they show us how the money that they spend in a mission-based funding bucket actually meets the mission and if it's not meeting the mission then we can dive into more detail." Concluding from that quote that, "Complementing the pathways with portfolio budgeting and contextual metrics for oversight provides the best opportunity for improving outcomes. The GAO, Congress, and stakeholders in the Department of Defense should work towards a data collection and reporting strategy that is consistent with agile development, portfolio management, and delegated decision-making."	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
52	**RL9**	9.3	**Implement a Modern Information Technology System:** Modern information technology systems allow for large, real-time, and even unstructured datasets. Some high-level requirements for contextual reporting for acquisition portfolios include: 1. **Real-Time Spend Reports**. Organizations should report obligations and expenditures with multiple dimensions of program tagging as well as traceability to deliverables. 2. **Metrics of Effectiveness.** Metrics should be tailored to the program context. For example, a command-and-control system might track the number of connected shooters and sensors, the number and types of users, time to complete particular workflows, system uptimes, time to restore critical capabilities, user satisfaction, and so forth. 3. **Descriptive Analysis.** Rather than spending months at a time creating a lifecycle estimate, actual cost data should be continually curated and connected with technical attributes into a single source of truth that helps inform incremental decisions. 4. **Program Traceability.** Project costs and technical outcomes at the lowest possible level should be mapped to their antecedents and dependencies between programs, creating a "family tree" of individual efforts. 5. **Human Factors.** Participant and stakeholder perspectives should be reported using the multi-disciplinary methods of project histories and linked to the strategic landscape.	**Yes**
53	**RL9**	9.4	He notes that the new acquisition pathways allow programs of record to become disaggregated and proceed incrementally using rapid prototyping, rapid fielding, and iterative software. However, GAO finds that such flexibility creates "challenges for reporting, monitoring, and oversight" such as tracking "cumulative cost, schedule, and performance data for programs transitioning between acquisition pathways or conducting multiple efforts" (GAO, 2022).	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
54	**RL15**	15.1	First consider <u>principles for what we expect from the defense budget</u>. What should be in it? What characteristics should it exhibit? How should it be structured, assessed, and conveyed? (1) It should, for a constitutionally based federal democratic republic [provide] national defense as the priority. (2) It should be transparent (with necessary classification exceptions) to the nation's people and their elected representatives. (3) It must be accountable to the laws governing its structure and the activities it supports without adding undue restrictions to those laws. (4) It should enable definition and acceptance of well-defined risk in decision making—specifically, what risk, to whom, for how long? (5) It should be agile, resilient, and responsive. (6) It must reflect and support the way the military will evolve and operate—digital, jointly, and in coalitions. (7) It should be developed, analyzed, presented, and assessed with outcomes at the forefront.	**Yes**
55	**RL15**	15.2	On the "<u>clear out noncore mission programs and activities,</u>" she recommends a direct approach: * Align current defense programs that are the primary mission of other organizations to those organizations. Programs found to be of lesser priority should be ended, at least at the federal level. * Move entitlement-like spending embedded in the defense budget (health care, compensation, and benefits) that do not produce military capability to a separate budget for management and execution.	**Yes**
56	**RL15**	15.3	On <u>prioritize federal domestic spending to support the nation's security</u>. For example, the Department of Education should focus resources on vibrant, interactive primary, secondary, and workforce education and training in skill sets the nation needs for long-term security and economic vitality.	**Yes**
57	**RL15**	15.4	<u>Modify and update the budget to support the way programs should be developed, tested, and procured today</u> and to easily—and automatically—answer key management and oversight questions. These changes must fix the key problems related to speed, transparency, responsiveness, and alignment to strategy.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
58	**RL15**	15.5	<u>Remove or reduce artificial barriers</u> like shares of the budget between the Military Departments, "color of money," life of funds, budget activities, program elements, and programs of record. These would be replaced with capability management and real-time, dynamic tools that provide visibility on program performance, status, and progress in producing outcomes.	**Yes**
59	**RL15**	15.6	<u>Joint development of capability-oriented budgets</u>—not service-specific platforms—that include the Combatant Commands (COCOMs) and Joint Staff. Resulting in reduced and combined program elements and budgets under outcome-focused management and mitigate the friction between capability providers and COCOM demand signals. "If budgets are unable to support requirements, then defined risk would be accepted or strategies would need to be adjusted—as would COCOM-directed tasks - to avoid the current and perpetual strategy-resource mismatch as well as the cognitive dissonance that takes place during program/budget review when we try to pretend such a mismatch does not exist."	**Yes**
60	**RL15**	15.7	<u>Reduction of budget divisions resulting in added flexibility.</u> "Programs not dedicated to a specific program or weapon system would support the integration of existing systems, the insertion of new technologies, and the creation of new operational concepts that would allow the Department to competitively improve warfighting outcomes now rather than waiting years for new weapons systems, thereby possibly also eliminating the technology valley of death."	**Yes**
61	**RL15**	15.8	Recommend taking another shot at a biennial budget process to fully incorporate program performance and strategic direction into budget development. Strategic direction would need to be clear and actionable. Substantial funds would be held back from programming for a program/budget review that is not crammed into the end of the calendar year. Combining this change with reforms to the budget itself that allow for—and actually encourage—changes to proposed plans to incorporate innovative solutions that could not have been known during plan development would contribute to a cultural change in favor of outcomes management, not just budget execution.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
62	**RL15**	15.9	Each year's program objective memorandum (POM) development process should have past performance as the first question, bullet, assessment, and fact on every decision brief. What changed? What are the lifetime operations and sustainment cost projections with key drivers and unknowns? Where and when will technology refresh occur? The "planned vs. actual" facts and figures should be easily generated from a budget and financial system supporting management and decision making. They should not be tough questions to answer, requiring mostly manual, nonrepeatable data calls as they do now.	**Yes**
63	**RL15**	15.10	Efforts should be expanded and accelerated to create a single data analytics system (ADVANA) to harness the power of the financial, budget, personnel, contracts, logistics, information, readiness, and property data now available in the myriad of systems.	**Yes**
64	**RL15**	15.11	A new structure accompanying the generation of timely, reliable, and responsive program data would support congressional oversight responsibilities.	**Yes**
65	**RL15**	15.12	Must keep in mind three basic things: First, funds must be used in a manner consistent with the strategy. Second, we should get a dollar's worth of value for every dollar spent, and investments should produce the outcomes the nation needs. Third is transparency and accountability. The defense budget structure must enable each element of stewardship, which is foundational to trust in the use of taxpayer funds.	**Yes**
66	**RL15**	15.13	A critical requirement is that the budget structure [should] support budget agreements that avoid the damages of continuing resolutions, which carry last year's funding and priorities into the next year when Congress fails to act on annual appropriations bills.	**No**
67	**RL68**	68.1	The Department may need resource allocation mechanisms that can move funds in a timely manner to capture technology solutions and move them quickly from concept to fielded capability. This approach also forces a reevaluation of how DoD conducts oversight and management.	**Yes**
68	**RL68**	68.2	Flexibility must come transparency and accountability. Digital transparency is the key to effective oversight of contemporary commercial resource allocation systems. DoD currently relies on manual data calls with results distributed across multiple enterprise information systems to justify its budget to Congress. DoD needs to explore how it builds leadership accountability into the resourcing process.	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
69	**RL68**	68.3	Q. Do PPBE and related resource allocation processes, including the appropriations process, limit the ability of emerging technologies to cross the "valley of death" into operations and contribute to DoD's inability to compete in time with agile competitors?	**No**
70	**RL68**	68.4	Q. Is the DoD's current planning process able to translate future concepts of operations into the programming guidance necessary to develop future warfighting capabilities, or is it overly constrained by the construct of a weapons system program?	**No**
71	**RL68**	68.5	Q. Does the current emphasis on a predictive requirements system hinder the Department's ability to rapidly adopt emerging technologies and undermine its use of recent procurement reforms?	**No**
72	**RL68**	68.6	Q. Is the Department's reliance on manual data calls, PowerPoint presentations, and PDF spreadsheets hosted on different enterprise systems a hindrance to effective budgetary oversight and digital transparency?	**No**
73	**RL68**	68.7	Q. Are year-of-execution reprogramming authorities big enough or flexible enough to allow the Department to take advantage of the dynamics of the emerging technology market?	**No**
74	**RL68**	68.8	Q. Are DoD's programmatic measures of effectiveness and performance structured to value adherence to original predictions over the potential of unforeseen outcomes? Is the DoD measuring the right things?	**No**
75	**RL133**	133.1	GAO recommended that the SECDEF implement an enterprise-wide portfolio management approach to making weapon system investments that integrates the determination of warfighting needs with available resources and cuts across the services by functional or capability area (p. 25/GAO Draft Report).	**Yes**
76	**RL133**	133.2	GAO recommended that the SECDEF implement a review process in which needs and resources are integrated early and in which resources are committed incrementally based on the achievement of specific levels of knowledge at decision points (p. 26/GAO Draft Report).	**Yes**
77	**RL133**	133.3	GAO recommended that the SECDEF prioritize programs based on the relative costs, benefits, and risks of each investment to ensure a balanced portfolio (p. 26/GAO Draft Report).	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
78	**RL133**	133.4	GAO recommended that the SECDEF require increasingly precise cost, schedule, and performance information for each alternative that meet specified levels of confidence and allowable deviations at each decision point leading up to the start of product development (p. 26/GAO Draft Report).	**Yes**
79	**RL133**	133.5	GAO recommended that the SECDEF establish portfolio managers who are empowered to prioritize needs, make early go/no-go decisions about alternative solutions, and allocate resources within fiscal constraints (p. 26/GAO Draft Report).	**Yes**
80	**RL133**	133.6	GAO recommended that the SECDEF hold officials at all levels accountable for achieving and maintaining a balanced, joint portfolio of weapon system investments that meet the needs of the warfighter within resource constraints (p. 26/GAO Draft Report).	**Yes**
81	**RL133**	133.7	GAO recommended that the DoD take steps to support Department-level decisions makers and portfolio managers by developing a stronger joint analytical capability to assess and prioritize warfighting needs (p. 26/GAO Draft Report).	**Yes**
82	**RL17**	17.1	The authors recommend being bold in vision: The DoD's industrial-age approach is different from almost any organization in the world and thus the committee should look to the history of defense management, international ministries, and large commercial enterprises. Organizational and portfolio budgeting are not new ideas, and today's corporate best practices show how to spur innovation in large organizations.	**Yes**
83	**RL17**	17.2	The authors recommend being focused in approach: Even though the individual findings of the Section 809 Panel had merit, the three volumes of the final report are not defined enough. The commission should focus on three lines of effort: (1) portfolio management; (2) reporting and transparency; and (3) budget build process.	**Yes**
84	**RL17**	17.3	The authors recommend being pragmatic in implementation: The commission needs to make recommendations that can be rolled out incrementally, such as setting up pilot portfolios across the DoD to test out new approaches. Focus first on high-interest and software-intensive program offices across the services and immediately move for FY23 pilot portfolios, creating opportunities for learning, adjustment, and expansion over time.	**Yes**

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85	**RL18**	18.1	Guidehouse recommends that the Commission agrees on a "current state" to benchmark against the best practices of DoD budgeting process versus those of other federal entities and commercial organizations outside of the DoD. The Commission can consolidate various artifacts that provide clear guidance on how the OSD and Services execute the "Budgeting" and "Execution" Phases of the PPBE system, which should quickly establish the reality of the current process and accelerate the development of actionable recommendations. The key to this is in understanding where and how to quickly acquire these artifacts - as well formal and informal feedback loops.	**Yes**
86	**RL18**	18.2	Guidehouse recommends that the Commission provides detailed, impactful recommendations that call to action the processes of: approving changes within the DoD, analyzing the impact of doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy considerations, and understanding the "why" for any recommendations, via strong communications with detailed roadmaps and demonstrated feasibility.	**Yes**
87	**RL18**	18.3	Guidehouse recommends that the Commission determines which type(s) of investments are needed to ensure that the right data gets to decision makers at the right time via established processes and modules in Advana to collect the source data needed to perform data collections, validation, and analysis to critically support the Commission's recommendations.	**Yes**
88	**RL25**	25.1	Wong recommends that resourcing defense innovation can be approached by grouping the key values missing in contemporary proposals to PPBE reform: Consistency, Agility, Coherence, and Transparency; with the following reform proposal topics: more efficient execution of existing PPBE process(es), broader or different units of analysis, integrated portfolios, removal of RDT&E from the FYDP, and more powerful programming; to explicitly measure their characteristic values and themes to ultimately determine that Consistency and Agility are key tensions in most proposals.	**Yes**
89	**RL27**	27.1	Wong recommends widening the intake of rapid acquisition ideas. This can be done by lowering the entry requirements for service members to initiate a rapid acquisition request and also educate experienced SNCOs and field grade officers on the acquisition process to the policies and processes for rapid acquisition.	**Yes**

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90	**RL27**	27.2	Wong recommends introducing scalable rapid acquisition authority for services by enacting legislation, increasing the authority of each service to fund rapid acquisition programs without seeking prior approval from Congress or to help provide the necessary leadership signal to subordinate stakeholders in regard to funding rapid acquisition.	**Yes**
91	**RL27**	27.3	Wong recommends the DoD expect to continue to use single-purpose task forces to rapidly and effectively address missed opportunity gaps. Attempting to rapidly address a missed opportunity through a targeted policy (and not a task force) is inadvisable because it would further muddle the process by opening up the possibility that any decision made by the service or joint acquisition process can be held up by stakeholders wielding such a policy.	**Yes**
92	**RL28**	28.1	The authors recommend that the SECDEF issue challenge-driven Defense Planning Guidance (DPG) to support the FY25 POM. This recommendation is tied to the report 's First Step: Strengthen DPG and assert SECDEF authority.	**Yes**
93	**RL28**	28.2	The authors recommend that the Deputy Secretary of Defense (DSD) and Vice Chairman of the Joint Chiefs of Staff (VCJCS) reestablish the Advanced Capability and Deterrence Panel (ADCP) as a Defense Management Action Group (DMAG) guiding organization immediately. This recommendation is tied to the report's First Step: Strengthen DPG and assert SECDEF authority.	**Yes**
94	**RL28**	28.3	The authors recommend that Congress reaffirm the SECDEF's role in aligning the DoD budget with national strategies. This recommendation is tied to the report's First Step: Strengthen DPG and assert SECDEF authority.	**Yes**
95	**RL28**	28.4	The authors recommend that the DoD proactively withhold service topline for joint needs. This recommendation is tied to the report's First Step: Strengthen DPG and assert SECDEF authority.	**Yes**
96	**RL28**	28.5	The authors recommend that the SECDEF require the components to develop a joint vision for the FY25 POM. This recommendation is tied to the report's Second Step: Institutionalize budget planning collaboration.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
97	**RL28**	28.6	The authors recommend that the Office of the Secretary of Defense (OSD) and Congress establish a collaborative budget review at the end of each fiscal year. This recommendation is tied to the report's Second Step: Institutionalize budget planning collaboration.	**Yes**
98	**RL28**	28.7	The authors recommend that the SECDEF institute joint budget reviews between service programmers and OSD prior to formal POM submission. This recommendation is tied to the report's Second Step: Institutionalize budget planning collaboration.	**Yes**
99	**RL28**	28.8	The authors recommend the DoD and the components publish a special funds primer with key details. This recommendation is tied to the report's Third Step: Characterize and monitor special funds.	**Yes**
100	**RL28**	28.9	The authors recommend the DoD and Congress establish criteria for creating and continuing special fund accounts. This recommendation is tied to the report's Third Step: Characterize and monitor special funds.	**Yes**
101	**RL28**	28.10	The authors recommend that Congress make the longevity of the EDI and PDI accounts dependent on DoD's collective ability to satisfactorily meet CCMD IPL inputs as determined by the SECDEF. This recommendation is tied to the report's Third Step: Characterize and monitor special funds.	**Yes**
102	**RL28**	28.11	The authors recommend that DoD and Congress allow consolidation of BLIs using a phased approach. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**
103	**RL28**	28.12	The authors recommend that Congress increase BTR threshold percentage from 20% to 50%. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**
104	**RL28**	28.13	The authors recommend that Congress update new start cost constraints to promote innovation. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**
105	**RL28**	28.14	The authors recommend that Congress allow DoD to submit overbalanced ATR packages. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
106	**RL28**	28.15	The authors recommend that DoD and Congress establish a Congressional mark adjudication process. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**
107	**RL28**	28.16	The authors recommend that the DoD establish a FMR streamlining committee with Congressional support. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**
108	**RL28**	28.17	The authors recommend that Congress allows an expansion of BA-8 software appropriation pilots. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**
109	**RL28**	28.18	The authors recommend that Congress initiates a portfolio management budget pilot. This recommendation is tied to the report's Fourth Step: Enable execution year flexibilities.	**Yes**
110	**RL28**	28.19	The authors recommend that the Joint Staff provide Congress an operational effectiveness assessment with the budget submittal. This recommendation is tied to the report's Fifth Step: Modify oversight mechanisms.	**Yes**
111	**RL28**	28.20	The authors recommend that the DoD initiate development of portfolio management measures. This recommendation is tied to the report's Fifth Step: Modify oversight mechanisms.	**Yes**
112	**RL28**	28.21	The authors recommend that the DoD assess use of venture capital approaches for managing advanced technology efforts. This recommendation is tied to the report's Fifth Step: Modify oversight mechanisms.	**Yes**
113	**RL28**	28.22	The authors recommend that the DoD propose a new investment category structure that better aligns to the reality of current military investments. This recommendation is tied to the report's Fifth Step: Modify oversight mechanisms.	**Yes**
114	**RL28**	28.23	The authors recommend that the DoD continue to mature ADVANA and incorporate Congressional feedback. This recommendation is tied to the report's Fifth Step: Modify oversight mechanisms.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
115	**RL28**	28.24	The authors recommend that the DoD and components enable key personnel participation in oversight forums. This recommendation is tied to the report's Fifth Step: Modify oversight mechanisms.	**Yes**
116	**RL32**	32.1	Gledhill recommends that Congress repeals the requirements for Pentagon wish lists to address several concerns about poor prioritization at the Pentagon.	**Yes**
117	**RL32**	32.2	Gledhill recommends that Congress thoroughly tests and evaluates acquisition programs before funding them, preventing sunken cost fallacy issues like the current F-35. "There is no reason to sink taxpayer dollars in systems that may not even work."	**Yes**
118	**RL32**	32.3	Gledhill recommends that Congress be aware of more wish list items disguised as suggestions and not compromise on cost and pricing data over speed or oversight.	**Yes**
119	**RL132**	132.1	**Pilot streamlined milestone decision process on selected MDAPs.** As a longer-term effort, select several current or new major defense acquisition programs to pilot, on a broader scale, different approaches for streamlining the entire milestone decision process, with the results evaluated and reported for potential wider use. The pilot programs should consider the following: • Defining the appropriate information needed to support milestone decisions while still ensuring program accountability and oversight. The information should be based on the business case principles needed for well-informed milestone decisions including well-defined requirements, reasonable life-cycle cost estimates, and a knowledge-based acquisition plan. • Developing an efficient process for providing this information to the milestone decision authority by (1) minimizing any reviews between the program office and the different functional staff offices within each chain of command level and (2) establishing frequent, regular interaction between the program office and milestone decision makers, in lieu of documentation reviews, to help expedite the process.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
120	**RL131**	131.1	**Adopt the fast follower strategy for commercial technology** with national security implications that has its own version of R&D, which is "replicate and duplicate." The DoD leaves the experimentation, risk, and failure to others and poises itself to rapidly exploit the newly discovered technical knowledge. Refer to the article for the detailed "attributes" of this strategy, but essentially the DoD sets itself up to be a fast follower in technical areas where the marketplace is moving much faster than it can, and "follows" and nurtures those areas where it cannot keep pace with the technical advances—but is ready to exploit the advances.	**Yes**
121	**RL130**	130.1	**Implement a Portfolio Management system**, similar recommendation made in the 2007 GAO report. Identifies various impediments to doing proper portfolio management.	**Yes**
122	**RL128**	128.1	**Take steps to fund DoD on a biennial basis.** As a means of reducing the workload of Pentagon budgeteers and programmers and eliminating the incentive to "cut and paste" previous POMs from one fiscal year to the next, DoD's senior leaders should initiate conversations with Congress to address this issue. Gaining momentum from Secretary Carter's call for a "multiyear budget process," OSD should work with House and Senate leaders to determine the appropriate balance between Congressional oversight and departmental independence. An initial step could include discussing the difference in culture between Congress' short-term, "chaotic" reacting and DoD's long-term, "laborious" planning. Engaging in an initial conversation with Congress and focusing on incremental progress could yield greater flexibility in the future. In proposing a biennial authorization and appropriation process, DoD should emphasize that two-year budgets could undergo a second round of amendments after the first year. Doing so would assuage Congressional concerns in allocating an additional year of funding and enable DoD to respond more readily to the ever-changing international landscape. As part of this "review mechanism," Congress could maintain a level of control it deems appropriate, while allowing DoD the flexibility it desperately requires to develop a budget along a more fluid timeline.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
123	**RL128**	128.2	**Plan for the worst.** The Deputy Secretary of Defense should appoint a small team of experts to monitor the annual impact of DoD absorbing its OCO account into the base budget. Although initiating such an exercise might send a political message of mistrust to Capitol Hill, DoD cannot ignore the possibility of further fiscal constraints. Should the fiscal environment worsen, Congress could drastically rein in OCO spending, requiring the Pentagon to fit billions of dollars into its fixed budget. The team would assess the risks of doing so and develop recommendations for prioritizing programs and missions in order to execute the defense strategy. Likewise, this would prevent senior leaders from scrambling to react to a steep decline in OCO funding and allow them to maintain a steady focus on the other many crises that will dictate their schedules.	**Yes**
124	**RL128**	128.3	**Strengthen PPBE's execution phase.** Particularly in an era of fiscal austerity, it is crucial that DoD make the best use of every dollar at its disposal. The final phase of PPBE, therefore, provides an excellent opportunity for senior leaders to discuss what worked, what did not, and how the process can be improved for its next iteration. Led by the Deputy Secretary of Defense, DoD should establish a forum on execution to reaffirm its commitment to this self-checking, internal mechanism for evaluation. Participants in this series of meetings should include both senior leaders at the undersecretary level and action officers at the staff level. In order to take a more holistic view of DoD's budgeting cycle, they should not only examine one cycle of PPBE, but also evaluate the process and its results in tandem with previous sequences as well. In particular, giving greater weight to PPBE's execution, a phase that goes largely ignored, allows DoD to analyze whether the process produced concepts and programs that align with the priorities outlined at its earlier stage.	**Yes**
125	**RL128**	128.4	**Prioritize elements of planning guidance.** In order to provide clear and upfront direction to all DoD components, the Secretary and Deputy Secretary of Defense should issue a directive that categorizes roles and missions as critical, high risk, low risk, or optional. Identifying particular labels matters less than the exercise of prioritization. This action can help to eliminate ambiguity over the ways and means of executing the defense strategy and establish a strong link between priorities and investments. Particularly during a time of austerity, it is critical to prioritize what is essential and what is not. Investing in unmanned aerial vehicles, for example, could be labeled "critical," while building the next generation of aircraft could be designated as "high risk."	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
126	**RL128**	128.5	**Expand funding within CAPE and the Joint Staff.** Current dynamics within the Pentagon demonstrate an imbalance in practice between the services and civilian oversight, as well as deference to the individual services over the Joint Staff. In order to mitigate some of the parochial tendencies of the Air Force, Army, Navy, and Marine Corps, DoD should increase funding (and the number of billets to correspond with additional personnel), particularly within the analytic community, to CAPE and the Joint Staff's J8, the office responsible for force structure, resources, and assessments. The key, however, is not simply providing more money, but monitoring closely how the additional funding is used to make the analytic community more robust. Such an initiative will help to integrate the activities of the services, as opposed to each developing scenarios and modeling on its own.	**Yes**
127	**RL128**	128.6	**Establish an informal forum to discuss strategic analysis.** In order to foster an inclusive culture among the analytic community and break down institutional barriers, DoD should encourage civilian and military personnel at the staff level (GS-15 or O-6) to participate in a monthly luncheon or roundtable. A supplement to existing professional organizations, such as the Military Operations Research Society, the goal of this informal forum would not be to finalize details that were not discussed in previous meetings, but rather to build relationships across the services and civilian components. The conversation should focus on identifying areas of commonality, sharing best practices, and gaining a new perspective from colleagues. As a means of incentivizing participation in this forum, supervisors at the director level should evaluate their personnel based on efforts to work across the Department horizontally, not simply vertically. Creating such a discussion will help promote a wider culture of impartial and objective analysis in the long-term.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
128	**RL128**	128.7	**Increase education related to PPBE.** PPBE is a critical process that undergirds every subsequent DoD mission. If defense leaders do not lay this foundation properly, subsequent initiatives may be jeopardized. Yet, despite its importance, many individuals who work for the Department have little understanding of this process or maintain narrow perspectives on how it operates. Those who work in both functional and regional offices must maintain a basic knowledge of how the Pentagon aligns resources with ends, ways, and means. Doing so will help its personnel to think more strategically and serve as better stewards of taxpayer dollars. Just as organizations require their new employees to complete a certain level of training before joining the office, defense leaders should make a standardized PPBE familiarization course required for all incoming personnel, both at the junior and senior levels.	**Yes**
129	**RL128**	128.8	**Empower a PPBE czar and adjudicator to oversee the process from start to finish.** In order to centralize authority, hold DoD components accountable for their work, and ensure discipline throughout PPBE, the Deputy Secretary of Defense should take the reins of the process. The deputy should assume a greater role in issuing clear guidance to the Department at the beginning of the PPBE cycle, monitor progress made during the year, and conclude the process by soliciting best practices for the next iteration. Furthermore, he or she should serve as a referee in settling disputes between senior leaders across the services, combatant commands, and civilian components. For tactical-level disputes, however, the Deputy Secretary of Defense should appoint a member from his or her staff to work on these issues and quell tensions among the actors in question. This person should attend high-level meetings, including the DMAG, in order to best articulate the decision reached and serve as a subject matter expert when most of the senior leaders might lack the required intimate familiarity with the details. A structure that allows Pentagon officials to engage in a frank and transparent debate within the building but requires them to recognize that ultimate decisions are made by an enforcing figure, will enable PPBE to run more smoothly.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
130	**RL128**	128.9	**Articulate a clear vision of leadership.** No matter who serves as Secretary or Deputy Secretary of Defense, he or she must outline their priorities for the PPBE process. In particular, the Deputy Secretary of Defense should lead from the top by gathering key stakeholders in order to solicit alternative perspectives, discuss competing visions, and, most importantly, adjudicate among them. To initiate real change in this process will expose resistance from organizations whose individual interests are served by the current system. Overcoming these tensions will require a significant expenditure of time and political capital by the Department's most senior leaders. Playing a personal leadership role in bringing about change and achieving "buy in" early in the process or, ideally, before the latest cycle begins, however, will reduce the likelihood of future bureaucratic conflicts among various Pentagon components. Setting such a tone quickly will help foster a culture in which discussions among senior leaders remain at a higher and more strategic level than they would otherwise. Furthermore, institutionalizing these responsibilities, as the current Deputy Secretary of Defense is doing, will ensure that whoever occupies this position will continue to play a central role in the process.	**Yes**
131	**RL128**	128.10	**Standardize the PPBE process.** As it stands, each service executes PPBE in a different manner, preventing DoD from undergoing the process uniformly. In the short term, the Deputy Secretary of Defense and the Under Secretary of Defense for the Comptroller should work with service leaders to identify the pros and cons of PPBE across the Air Force, Army, Navy, and Marine Corps. In the long term, the attributes of the process identified in these discussions will allow DoD to institute a standardized and increasingly effective version of PPBE. Furthermore, the Deputy Secretary of Defense should develop common questions that all the services should address throughout their POM development. Creating a common framework for assessing risk and making tradeoffs will integrate service activities more easily and allow senior DoD leaders to make the best use of data at their disposal.	**Yes**
132	**RL134**	134.1	**Innovation Funds** The first recommendation is to create a cohort of warfighting exercises resourced by innovation funds. The goal should be operationalizing prototypes and validating requirements. A merit-based selection process such as commercial solutions opening should be used by chief technology officers to allocate component-specific funds of roughly $100 million each. Congress could create "boards of advisors" to monitor use of the funds in the year of execution.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
133	**RL134**	134.2	**PE Consolidation** The second recommendation provides a means for the program offices to receive these efforts across the valley of death through some level of PE consolidation. This can be done through two principal approaches. First, propose certain PEs with more flexibility to expand the scope of projects without a new start. Second, group well-defined programs under a single PE to help balance execution. The most logical method for consolidating PEs is by capability area, mission thread, or program within each Program Executive Office (PEO). The services could each select two or three pilot consolidated PEs from PEOs for congressional consideration, for example. A rule of thumb such as a $20 million minimum PE size can be encouraged for these pilots.	**Yes**
134	**RL134**	134.3	**New Starts** The third recommendation is to continue the prior approval process for new starts and terminations at current thresholds but tweak the definition such that prior approval is only required if the effort is above threshold for the fiscal year, rather than for the life of the effort. Only a small development program is fully completed within $10 million. However, $10 million within a fiscal year with the potential for follow-on funding provides an important source of execution flexibility. Letter notification will still be maintained, providing Congress 30 days to deny the action. This change could be enabled by an administrative update to Volume 3, Chapter 6 of the DoD Financial Management Regulation, replacing "for the entire effort" with "for the fiscal year."	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
135	**RL134**	134.4	**Reporting** The fourth recommendation is to improve transparency through real-time reporting capabilities that provide insight below the PE level. This is a common thread for the above recommendations, to assure accountability is maintained and Congress can communicate its interests. This requires modernization of reporting systems from both DoD and Congress—such efforts are already underway. Obligations at the lowest level should have multiple tagging formats and be linked to contract data to provide end-to-end visibility. They should be indexed to documentation, test reports, and analysis. After conversations with officials from various perspectives, Center researchers do not believe that increases in reprogramming thresholds or the use of expired funds provide a feasible near-term path to execution flexibility. Both present more challenges than opportunities, particularly because they have been abused in the past, undermining trust. With better approaches to innovation funds and PE consolidation, DoD and Congress have the opportunity to inject increased flexibility into the resourcing process. It does not require new laws or extensive re-writes [of existing legislation].	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
136	**RL126**	126.1	**Make maintaining, and eventually extending, the U.S. military-technological edge the Department's highest investment priority.** The next Secretary of Defense should make accelerating the fielding of capabilities that will safeguard the U.S. military's edge over the next decade and beyond the Department's top investment priority. The Secretary should begin by announcing a number of big bets that will drive investment and ultimately determine whether the U.S. military keeps its edge in the next decade. By way of example, this agenda could include (1) a secure, resilient C4ISR network of networks capable of supporting the joint force in an A2/AD environment; (2) AI-enabled decision support to ensure that commanders and operators can make decisions better and faster than the adversary; (3) fleets of integrated autonomous systems that can team with manned platforms to perform critical functions while reducing the need to put service members at risk in the most lethal environments; (4) dramatically increasing and diversifying long-range precision fires to complicate and overwhelm adversary attack planning; (5) manned and unmanned logistics solutions that support a more distributed force; and (6) defensive cyber, electronic, and kinetic capabilities that meaningfully improve the survivability and combat-effectiveness of legacy platforms in an A2/AD environment. Whether or not these are the right big bets can and should be debated. The important thing is for the Department leadership to decide and coalesce around a set of big bets, and then to pursue them relentlessly and urgently in service programs and budgets. The DoD leadership team should then develop an implementation plan to make these critical capabilities a reality. This plan should include a realistic set of measurable goals, implementation strategies and performance measures, and a clear delineation of associated roles and responsibilities. The Secretary should be clear on who is empowered to do what and on who is accountable, as well as on how incentives will be realigned to support the plan's success. Empowered, accountable leadership focused on advancing a clearly defined DoD agenda will be essential to keeping and extending the U.S. military's advantage against great power competitors.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
137	**RL126**	126.2	**Choose and empower a team of leaders who are capable of and committed to delivering on this effort.** In order to accelerate the pace and scale of progress, it will be imperative for the next Secretary to appoint a team of senior officials who meet the following criteria: deep expertise and competence in their areas of responsibility; proven leadership in empowering teams, listening to diverse views, making tough decisions, and delivering results; mission-driven and able to work well in a team of strong peers (possibly applying President Barack Obama's opening guidance to his transition team: "No ego, no drama, this is not about you"); and diverse backgrounds, experiences, and perspectives that will ultimately contribute to better decision-making and organizational performance. This team will need to develop a shared understanding of role clarity and be fully empowered and resourced to deliver on its assigned responsibilities. In addition, given the difficulty of the task and the time needed for change management to take hold, the Secretary should ask senior civilian leaders to commit to longer tours of duty than the average 18–24 month stint of a political appointee, and should engage military leaders on whether longer tenure in some critical military positions should be considered (bearing in mind Admiral Hyman G. Rickover's decades-long effort to create the nuclear Navy).	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
138	**RL126**	126.3	**Devote considerable senior leader time and bandwidth to sharpening the U.S. military's technological edge and empower the Deputy Secretary and Vice Chairman to drive this agenda forward day to day [abbreviated]. [Refer to the original article for the details.]** (1) The Deputy Secretary of Defense should be empowered, in partnership with the Vice Chair of the Joint Chiefs, to take point on driving military-technological innovation agenda day-to-day and across the Department. (2) Establish an Advanced Capabilities and Deterrence Board (ACDB), co-chaired by the Deputy Secretary and the Vice Chairman and modeled on the Advanced Capabilities and Deterrence Panel established by Secretary Hagel in 2014, to provide oversight of technology development and operational and organization reform efforts focused on advancing the Third Offset Strategy. The ACDB, should oversee multiple lines of effort, including strategy, operational concepts, wargaming and experimentation, information management, DoD-intelligence community integration, and a new long-range research and development planning program for sustaining the U.S. military's technological superiority. (3) Empower the Under Secretary of Defense for Research and Engineering (USD[R&E]) to establish an innovation council to align S&T, R&D, and other tech innovation efforts and develop a clear roadmap. (4) Empower the Vice Chairman, supported by the Director for Joint Exercise, Training, and Assessments (J7), to coordinate service efforts, identify areas of interdependency (such as Joint-All-Domain Command and Control and cross-domain fires), and bring this work to the ACDB for review. Secretary of Defense Mark T. Esper's charge to the J7 to develop a joint warfighting concept that drives force experimentation, the Joint Requirements Oversight Council, and development of the defense program is an important start—as long as it is backed up by rigorous analysis and sustained senior leader commitment. (5) Set up a less formal working group of innovative, mid-career officials (05/06s and GS14–15s) from the services, combatant commands, acquisition, and other offices akin to the "Breakfast Club" established by Bob Work when he was Deputy Secretary.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
139	**RL126**	126.4	**Double down on and strengthen the links between concept development, wargaming, prototyping, field experimentation, and requirements [abbreviated]. [Refer to the original article for the details.]** (1) Set the high-level priorities and create mechanisms to keep sharpening-the-edge efforts on track; the most important thing the Department can do is invest heavily in concept development, wargaming, and experimentation. This is a long pole in the tent to radically transforming the way the United States fights. The details require robust funding from Congress. (2) Each service should empower a cross-functional team that brings together strategy and concept developers, technologists, operators, and acquisition officials to design and execute an integrated plan to leverage analysis, wargaming, and field experimentation at scale. (3) Put more resources—both funding and brainpower—into the development, testing, and refinement of new deterrence and warfighting concepts. This will require a strong push from the top, while at the same time empowering creative work inside and between the services from the bottom up. (4) The Department should also expand the use of operational analysis, including virtual and mixed-reality simulations, to test concepts and technologies at lower cost. (5) DoD should take advantage of cutting-edge industry assets. Many of the leading defense companies have state-of-the-art simulation and wargaming centers that can play any system and can help the Department test experimental capabilities and refine operational concepts.	Yes

#	Ref ID	Ref #	Recommendation made:	Actionable?
140	**RL126**	126.5	**Embrace the imperative to make hard choices [abbreviated]. [Refer to the original article for the details.]** After the DoD leadership determines what it needs to buy to keep and extend the joint force's edge, it must make the difficult tradeoffs to create room in the program and budget, including by undertaking a fundamental scrub of MDAPs. In order to make the tradeoffs necessary to position the United States military to compete, deter, and win, Department and service leadership **must answer four fundamental questions**. **(1)** For every major acquisition program, where is the "knee in the curve"? How does the United States strike the right balance between buying more platforms to build capacity and ensuring that it invests enough in developing and integrating the new capabilities the military will need to maintain its edge and buy down risk in the future? **(2)** DoD leadership must scrub even top priorities, such as modernization plans for the U.S. strategic nuclear deterrent and force readiness, to identify opportunities for meeting priority objectives at lower cost. **(3)** The Secretary should consider working with each Service Secretary and Chief to define a set of actionable goals to drive more rapid adoption of transformative technologies. **(4)** Given the near certainty of tighter budget constraints, in what domains and geographies should the United States choose to accept and manage an additional degree of risk? And in what parts of the force structure, and in what time frames?	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
141	**RL126**	126.6	**Increase and incentivize funding for innovation [abbreviated]. [Refer to the original article for the details.]** Once the Department determines which bets to place and how to make space in the budget to pay for them, it must then channel and stimulate funding for acquiring and fielding innovative technologies. It is past time for the Department to signal to industry, U.S. allies, and adversaries that it is serious about its innovation agenda. (1) Start by increasing S&T spending (budget activities 6.1–6.3 in the RDT&E budget), which is critical to ensuring long-term military-technical superiority. (2) Implement the Defense Science Board recommendation that DoD invest at least 3.4 percent of the total budget in S&T. In addition, funding for 6.5 (systems development and demonstration) account in the R&D budget, which provides a critical bridge from prototype to production, should also be increased to at least the historical average of 27 percent of the R&D budget. (3) The Department must also generate a clear demand signal and create more substantial recurring revenue opportunities to attract the best of Silicon Valley and other tech hubs across the country. (4) DoD should avoid trying to pick winners and losers among tech startups as an investor; it should do all it can to wield its influence as a major customer. Every dollar DoD provides in prototype awards can attract up to 10 dollars in equity capital. (5) The Department should also double down on proven innovation efforts by increasing funding for organizations such as DIU, DDS, Kessel Run, and the JAIC, and in some cases by seeking to replicate them more broadly across the services and the Department. (6) The Department should incentivize the prime contractors to spend more of their own money on R&D, to invest in innovative startups that are aligned with their mission focus, and to serve as channel partners to help smaller tech companies navigate to find and serve DoD customers. (7) Consider adding a new type of funding authority that supports both the development and testing of new digital technologies. For many emerging software-defined technologies, the distinction between research and development, operations and maintenance, and testing and evaluation (T&E) is artificial.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
142	**RL126**	126.7	**Bridge the valley of death [abbreviated]. [Refer to the original article for the details.]** This challenge will require new types of funding to help companies transition from a successful prototype that best meets a high priority need to an established program. It will also require stimulating demand from end-users in the military services in order to secure the necessary funding to produce and field the capability at scale. (1) The Department should work with Congress to increase the availability of bridge funds to rapidly scale the best prototypes into full-fledged programs. One potential approach would be to ask Congress to authorize funds, managed and allocated by OSD R&E, for which each service could compete in order to sustain capability development in the highest priority areas. (2) Each service should also consider establishing a cross-functional team responsible for reviewing the performance of its various emerging technology investments in order to identify failing or underperforming initiatives from which to divest, as well as high-performing, high-priority efforts to accelerate with additional funding. (3) Adopt a portfolio management approach to ensure more effective resource allocation and faster progress. (4) Would require Congress to provide greater flexibility for reprogramming within a portfolio. **This should be a legislative priority for the next administration.**	Yes

#	Ref ID	Ref #	Recommendation made:	Actionable?
143	**RL126**	126.8	**Recruit, train, and retain a tech-savvy workforce [abbreviated]. [Refer to the original article for the details.]** The "secret sauce" of the U.S. military and the DoD more broadly has long been its people. In an era of profound technological disruption, the Department urgently needs to recruit, train, and retain a more technologically literate workforce, both military and civilian. Critically, the Department needs skilled subject matter experts—from computer scientists and engineers to software stack developers, AI application coders, product managers, data scientists, and data management experts. But it also needs program managers, contracting officers, operators, human resources professionals, lawyers, strategists, and concept developers who all know enough about technology to acquire, test, field, and trust it. (1) DoD also needs to create new career paths to allow science, technology, engineering, and math (STEM) graduates from the service academies and Reserve Officer Training Corps (ROTC) programs to serve their country as technologists, rather than being directed only into line officer billets. **[This is DCTC.]** (2) The Department should consider partnering with nongovernmental entities to source highly skilled personnel willing to do a tour of duty in the national security space. (3) More broadly, the Department should expand in-person and virtual technical training across OSD, the services, and other components to bolster tech literacy. (4) The Department could also consider standing up a technological training center that could provide tech literacy courses on key topics including AI/machine learning, cybersecurity, and software development. Organizations such as DDS and the JAIC could be leveraged to consult on standing up the center and could help scout and supplement the training curriculum. (5) DoD could create a sub-cadre of acquisition professionals—called DoD product managers—focused on software-driven systems and emerging technologies and trained to leverage best practices from commercial sector technology development and program management. This cadre would receive tailored training, performance metrics, incentives, promotion criteria, and career paths to create a culture that would prioritize agility, speed, risk-taking, and accountability. (6) The Department must create a culture of innovation that helps retain tech talent and rewards the workforce for embracing new technologies and approaches.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
144	**RL126**	126.9	**Build greater trust and support in Congress [abbreviated]. [Refer to the original article for the details.]** It is essential to reimagine the relationship between DoD and Congress in a way that respects and protects the latter's prerogatives while also enabling DoD to adopt critical emerging capabilities with greater flexibility and speed. Defense appropriators and authorizers must be willing to let the Department accept more risk in the short term, support the Pentagon when it makes hard but necessary choices to reduce or kill lower priority programs, and help accelerate the development and fielding of new capabilities critical to maintaining the U.S. military edge. (1) Congress should provide the services with robust funding to field small numbers of prototypes for early-stage concept development and experimentation without requiring precise clarity on how these systems will ultimately be used or what their final requirements will be. (2) DoD should also seek authority and funding to initiate design for production without new start authorization as long as funding is capped, competition is sustained, and no long-term commitment is made. (3) Congress should substantially increase reprogramming ceilings to enable the services and OSD to do better portfolio management and drive value based on evolving operational needs and technological performance rather than out-of-date metrics. (4) Congress should signal that it will not reverse the Middle Tier of Acquisition (MTA) or Other Transaction Authority (OTA). (5) The Secretary of Defense should engage key members of the defense committees and congressional leadership on the importance and urgency of sharpening the U.S. military's edge, the stakes involved, and DoD's proposed plan of action. (6) Services should regularly invite relevant committee members and leadership to observe wargames, technology demonstrations, and field experiments. (7) Services should strive for greater alignment in explaining to Congress how their respective decisions on planning, concepts, requirements, technology development, and acquisition support the overall effort to sharpen the edge of the joint force.	**Yes**
145	**RL124**	124.1	**1.2 - Require all new Major Defense Acquisition Programs to be AI-ready and nest with existing and planned joint all-domain command and control (JADC2) networks.** "No Implementation" - While Congress fully expects DoD to make Major Defense Acquisition Programs compatible with AI and JADC2, there are no current proposals in Congress to make this a requirement.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
146	**RL124**	124.2	**3.1 - Form a National Supply Chain Intelligence Center under the Director of National Intelligence to monitor and protect U.S. supply chain interests.** "No Implementation" - While the National Counterintelligence and Security Center (NCSC) under the Office of the Director of National Intelligence (ODNI) has labeled supply chain threats as a critical issue similar to cybersecurity threats, there are no efforts at the moment to establish a National Supply Chain Intelligence Center under the ODNI.	**Yes**
147	**RL124**	124.3	**5.6 - Create tax and other financial incentives for the private sector to invest in cybersecurity and prepare for gray zone attacks.** "No Implementation" - While there are a handful of financial incentives provided for specific sectors and locales, there are no tax or financial incentives that apply broadly across the private sector. The Federal Energy Regulatory Commission (FERC) recently issued a Notice of Proposed Rulemaking that would establish incentives to invest in cybersecurity beyond the minimum standards required by FERC. Pursuant to Executive Order 13636 in 2013, the Department of the Treasury and the Department of Commerce decided not to explore tax incentives due to the difficulty of targeting incentives and potential effectiveness concerns. Instead, they recommended bolstering the private cyber insurance industry through the adoption of rigorous standards and frameworks to underwrite insurance policies. The Department of Treasury and Department of Commerce should reconsider these analyses as the cybersecurity threat landscape has significantly changed since 2013.	**Yes**
148	**RL124**	124.4	**6.1 - Integrate military, national, and public service to create interoperability within these sectors to promote expansion of National Service programs.** "No Implementation" - Veterans display a preference for national service jobs and professional pipelines from AmeriCorps and the Peace Corps, creating informal links across the three sectors, but no further cross-sector integration has been formally implemented or proposed since the Future of Defense Task Force Report was released.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
149	**RL124**	124.5	**6.2 - Initiate paid, year-of-service programs with civilian, military, and private-sector pathways for youth to promote expansion of National Service programs.** "No Implementation" - Paid, year-of-service programs currently exist for specific sectors like the AmeriCorps program for education, the Peace Corps program for international development, and the U.S. Digital Service program for technology in government. However, no new programs have been proposed since the Future of Defense Task Force Report was released.	**Yes**
150	**RL124**	124.6	**10.4 - Streamline security clearances by beginning the vetting process in graduate school.** "No Implementation" - The security clearance process is recognized as a familiar barrier to federal employment, especially for graduate STEM students, and the COVID-19 pandemic has negatively impacted the speed of the security clearance process even further. Despite the parameters set by the FY20 Intelligence Authorization Act stating that 90% of all secret clearances and top secretary clearances should be adjudicated within 30 and 90 days respectively, processing for the fastest 90% of applicants is still 112 days for secret clearances and 181 days respectively for secret and top-secret clearances as of Q4 2021, a rate that has slowed over the course of 2021. As long as the lengthy security clearance process remains a major barrier to federal employment, graduate students, especially those in STEM fields, will further be incentivized to find employment in the private sector instead of public service.	**Yes**
151	**RL124**	124.7	**10.6 - Enable and incentivize "Tour of Duty" opportunities for private sector technical talent to serve tours within DoD.** "No Implementation" - There are currently proposals in Congress to establish civilian reserve programs, but they face opposition. The Civilian Cyber Security Reserve Act would establish a pilot program for private sector civilians with technical backgrounds to register to assist the government in a reserve capacity. It was proposed but not included in the final FY22 NDAA. Going forward, Congress must prioritize opportunities like these to increase integration of private sector technical talent into federal government.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
152	**RL123**	123.1	**How to fix the end-of-year spending spree known as "use it or lose it"?** Congress needs to allow DoD and other federal agencies to spend a portion of the O&M and MILPERS funds in the year after they were appropriated. Congress already allows DoD to do this for funding in procurement, research and development, and military construction accounts. A carryover of just 10 percent would help a lot. No added funds would be made available to DoD. But this small change would enable fund managers to decide whether to buy that new office equipment or save the money to spend on critical training in the next year when time is available to carry out additional exercises. Carryover is a wonky issue, but it would significantly improve the effectiveness of defense spending. The new administration should formally request carryover authority as part of any defense reform package and deploy senior leaders to help persuade Congress to change the law. There is bipartisan support to resolve this bad idea in national security and make DoD spending more efficient.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
153	**RL121**	121.1	**DoD's 40-plus boards must be restructured to help the Department think far bigger.** DoD needs to ask for big ideas, and it needs to reshape its boards to provide them. These advisory boards are comprised of individuals outside of their parent organization who can provide independent perspectives and advice. A board has no official role in managing; they can't hire, fire, or order people to do things. All they can do is offer advice. But with the right membership and senior support, they can have tremendous impact. (1) Overhaul the boards' membership to support this turn toward rapid innovation. In the past, the DoD has had some extraordinarily effective advisory boards. These boards should include a mix of insiders and outsiders. (2) After the overhaul is complete, the DoD should ask for big and bold ideas in several key areas, including: **Technology and innovation:** Given finite budgets, how best to evaluate, choose, and scale a plethora of new technologies and new operational concepts? **Business practices:** Examine and explore entirely new ways of building commercial partnerships and influencing the private sector. **Policy:** Ensure we understand our adversaries and how they are fusing together military, economic, and private markets to challenge us. **Human capital:** How should we reshape the DoD's personnel architecture to attract more technologists and fit into today's more sclerotic career paths? (3) DoD leaders should ask for more than ideas; they should engage and lead the boards. They should set high expectations for engagement and implementation and work up and down the chain to ensure recommendations are achievable. The boards should report to the principals of their sponsor organizations, who should regularly review whether the boards have delivered real value to the mission.	**Yes**
154	**RL120**	120.1	**Fix the Pentagon's funding process.** Although it's only included as a "note" regarding how China does business in the article, it can be used as a model to fix our funding process. The article, "The U.S. military's lack of adaptability also puts DoD at a disadvantage against its primary competitor, China's People's Liberation Army. Unlike the Pentagon's attempt to predict specific needs years in advance, the Chinese budget process rolls continuously from one year into the next and allocates money to services and bureaus in blocks that can pay for multiple functions or programs." **Hence, the recommendation is: Adopt a budget process that rolls funds continuously from one year into the next and allocates money to services and bureaus in blocks that can pay for multiple functions or programs.**	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
155	**RL120**	120.2	**Prioritize the customer.** Because the DoD's process is based on requirements, budgets are relatively inflexible, hence not much of a vote is given to the program managers' primary customers, the combatant commanders.	**Yes**
156	**RL116**	116.1	**Adopt portfolio accounts for prototype projects and acquisition programs.** This would involve consolidating platform-focused budget line items into logical portfolios where promising commercial technologies could be identified and more easily transitioned without the bureaucracy, uncertainty, and time penalties of a bridge fund. If a promising commercial solution could quickly meet an operational need driven by new threats, a portfolio approach would allow development activities to commence without having to request bridge funds or await the PPBE process. A key enabler includes abandoning strict program baselines that discourage adaptation, providing greater new start authority and encouraging more flexible requirements. This would lead to an innovation environment where the DoD has many "bridge funds" in the form of portfolio accounts, poised to onboard the most promising solutions to the DoD's toughest challenges.	**Yes**
157	**RL34**	34.1	**Six strategic defense priorities derived from overall U.S. national interests within a dynamic framework.** This provides a framework for senior leaders to assess the relative importance and risk associated with the use of force, as well as the criticality of developing solutions to identified capability gaps. The higher an item falls on the list, the more compelling the need. In fiscally constrained times, a framework such as this will help the JROC to objectively evaluate a potential solution by its relative importance to national security. This methodology should also help prevent an existing but mismatched program from continuing to receive funding.	**Yes**
158	**RL34**	34.2	**Speed of completing acquisitions.** The Services need to address this issue by developing and sustaining a cadre of both uniformed and civilian acquisition professionals who are suitably trained and have the requisite experience to do these types of evaluations, and then empower them to do so.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
159	**RL34**	34.3	**The military services need a trained cadre of personnel throughout the force to accurately and thoroughly delineate a new requirement.** Without an accurate requirements statement, mid-stream changes become more likely. Without a strong connection between the user, the producer, and the financier, cost overruns become more likely. And without the ability to clearly explain the time and cost effects of mid-stream changes, senior leaders cannot properly evaluate the balance of project timeliness, cost, and risk. To begin to correct this, training and assignment cycles for acquisition professionals need to be implemented earlier in the career path to allow time to mature skills prior to assumption of key positions, and field force personnel need basic training on how to write requirements statements.	**Yes**
160	**RL35**	35.1	**Employ the rapid CFT model used in commercial development.** Products are focused on customer needs and developed incorporating the best of current technology. A typical CFT is a team made up of the functions essential to product development—what the product is, how it will be designed, marketed, and sold. The primary benefit of CFT development is SPEED to production as development processes overlap vice occurring in sequence.	**Yes**
161	**RL38**	38.1	**Holistic and integrated approach.** To successfully reform defense acquisition where most attempts have failed, the commission must view the Planning, Programming, Budgeting, and Execution process as an integral part of the Defense Department's larger and intertwined acquisition ecosystem, a broader reform scope enabled by the commission's charter. Tackling the systemic issues hampering defense acquisition and the ongoing effort to modernize the force to keep pace with new near-peer threats requires a holistic approach. As Taylor presciently observed, not only does the U.S. military need to "know what kind and how much defense we are buying," it needs to do a better job of why it needs it and how it gets it.	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
162	**RL38**	38.2	**Improve requirements management processes for defense capabilities.** If one were to ask a requirements or program manager to scan defense-wide research and development initiatives that might benefit a potential capability gap, the response would likely be confusion. There is no "common operational picture" of ongoing or planned technology development efforts across the Department that managers can readily access and collaborate on to match future needs with potential solutions. Neither the acquisition process infrastructure nor the bureaucratic culture facilitates cross-organization and inter-service cooperation. The Department's requirements management process also lacks adequate mechanisms to keep abreast of civilian dual-use technologies that could benefit new defense systems or upgrade existing ones - potential solutions exist, but the will to address them may not.	**Yes**
163	**RL38**	38.3	**Congress and the Department should consider expanding programming and budgetary flexibility.** Specifically, the Department needs to develop a process for efficiently integrating research, procurement, and sustainment funds across common or interrelated programs. This will allow for greater budgetary dynamism and the agility to respond to unforeseen challenges. A bolder set of reform could even include discretionary funds, where service-level chiefs or Department heads could obligate funds across programs or even accounts.	**Yes**
164	**RL38**	38.4	**Congress should also consider establishing two- or even three-year authorizations and appropriations for *all* programs of record.** Under a portfolio management construct, program cohorts would undergo detailed hearings on those receiving two- or three-year allocations, and Department reviews during their pre-approved years. This would be a major departure for the administration and Congress, but this is how most European defense ministries operate.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
165	**RL38**	38.5	**Acquisition pathways need institutional onramps, not more highway fast lanes.** In its 2022 National Defense Strategy, the Defense Department outlines a "fast-follower" strategy to better integrate commercially available technologies. If the Department wants to improve commercial technology adoption, technology insertion should be continuous — not episodic. Despite the recognized need to buy and integrate commercial technology faster, the budgeting, acquisition, and procurement processes remain linear, sequential, and almost exclusively platform-centric. For example, the challenges associated with realizing the potential embodied in Joint All-Domain Command and Control are more bureaucratic in nature and less technological. Connecting disparate sensors across platforms and mission domains to enable faster decision-making is possible — the technologies exist. Institutionalizing continuous, cross-program technology insertion onramps would help the military to move away from a platform-centric and program-driven buying paradigm to instead reflect a new reality where technologies are increasingly platform- or program-agnostic.	**Yes**
166	**RL39**	39.1	**First, cuts to the defense top line, particularly those that would revert to 2022 levels, would be irresponsible, destructive, wasteful, and dangerous.** The FY 2024 budget for DoD should be set no lower than $882 billion to maintain the force we have during a continued time of high inflation and to also make the most of that force by fixing aircraft readiness, ship maintenance, shipbuilding, and providing necessary pay and compensation. This change would help to simplify and reduce spending for the FY 2024 budget while PPBE reform is immediately attempting to take shape.	**Yes**
167	**RL39**	39.2	**Second, as capacity is a capability of its own and the current and planned inventory of ships, planes, munitions, and ground assets is low and shrinking, there should be a priority on the procurement accounts, even at the expense of the research accounts if necessary.** Though a healthy research and prototyping effort is important to future modernization, the Department and Congress should shift focus to buying capability. Perpetual focus on research won't provide the capacity that is needed now, nor will it maintain a healthy industrial base and supply chain. This change would help to simplify and reduce spending for the FY 2024 budget while PPBE reform is immediately attempting to take shape.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
168	**RL39**	39.3	**Third, Congress should gather real data on the impacts of three critical disruptors to the industrial base—inflation, workforce, and supply chain.** This information should be used to target any special interest adds to areas that would have the most positive impact on national security and deliver the best bang for the buck to the U.S. taxpayer. The U.S. defense industry is experiencing the impacts of broad and unforeseen economic disruptions, in some cases more acutely than other markets since it is built on a trusted workforce with unique qualifications and a specialized supply chain ecosystem. This change would help to simplify and reduce spending for the FY 2024 budget while PPBE reform is immediately attempting to take shape.	**Yes**
169	**RL40**	40.1	**Integrate leading-edge technologies, allowing new innovations that support agility, speed, and improved accuracy.** While programs have been set-up across the DoD such as AFWERX, the DoD needs an enterprise-wide approach to integrating commercial innovation. To make this a reality, the DoD must find, promote, and highlight lean-forward leaders who are looking for innovation to squeeze every efficiency out of the system.	**Yes**
170	**RL40**	40.2	**Deliver mission alignment.** Delivering mission alignment requires better decision making, which demands harmonized data in as few systems of record as possible. The Army recognizes that it has a strategy-to-resource mismatch and that solving it means doing things differently from now on.	**No**
171	**RL40**	40.3	**Planning must be continuous.** Our current budget approach is episodic and disconnected. It provides little insight into historical performance and trends, which makes it harder to shape present and future strategic planning. Continuous planning, on the other hand, allows stakeholders to monitor goals, metrics, and milestones for existing priorities while simultaneously seeking new strategic priorities. Financial leaders connect dynamic, external factors – from macro trends such as inflation to individual events such as a natural disaster – with responses that provide the transparency and clarity leadership needs for decision dominance. It is faster as well, enabling decision makers the ability to model what-if scenarios and courses of action without limits.	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
172	**RL40**	40.4	**Transparency and accountability are embedded.** Identifying a need and manifesting a solution are vastly different. To deliver on this stated requirement, the DoD must institute a mechanism for promoting continuous dialogue that recognizes transparency is an act of mutual trust. Our next-generation defense system must promote this notion by guaranteeing that decisions are understandable, auditable, and well-considered.	**Yes**
173	**RL40**	40.5	**Collaboration is required.** Collaboration in a system of records makes all records auditable, holding individuals in the decision-making process accountable. Changing personnel doesn't lead to knowledge gaps during turnover as the history of decisions made is contained within a single system. Fostering collaboration will require a willingness to share unpopular opinions without reprisal. Opposing viewpoints based on sound, legitimate, argued reasoning are necessary to creating defensible strategies. No one will contribute to the discussion if they are passed over for a promotion or otherwise penalized for a contrary viewpoint.	**No**
174	**RL40**	40.6	**It must be enterprise-wide.** Continuous, integrated planning requires a holistic look across the entire enterprise to identify and influence the key factors and linkages that can best meet the mission. These linkages maintain strategic alignment, deliver enterprise agility, and result in more effective decision making. Delivering an integrated enterprise solution requires more than just software. This includes: • A common data framework for risk analysis that is applicable from the strategic to the tactical levels. • Cloud-native offerings that promote secure access to everyone from everywhere. • Process re-engineering to leverage technology and replace existing inefficient processes. • Strong leadership prepared to defend investing time and dollars into modernization	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
175	**RL110**	110.1	**Institute Carryover Authority for One-Year Money at the DoD.** The problems in "use-it-or-lose-it" emerge from the inability to use appropriated funds after their expiration date, which can lead to decreased quality in expenditures and undesired behaviors. If financial managers become able to hold on to some of these funds after their expiration date, it would severely alleviate the pressure to obligate resources. Congress sets the budgetary authorities for the DoD every year, so it should revisit the carryover percentage and use that time to evaluate how the authority is used. A five percent carryover authority would be a good place to start and should be evaluated periodically. Further, since authority is granted on an account and military service level, Congress could set smaller pilot programs, if there is hesitation in increasing financial flexibility. Thus, Congress can and should assess the data on how the Department uses the authority in its budget cycle to adapt future levels and lengths of the carryover authorities as part of a process of continual improvement.	**Yes**
176	**RL110**	110.2	**Test Ways to Relax the 80/20 Rule.** The 80/20 rule mandates that 80 percent of the budget needs to be obligated before the end of July. Congress should experiment with relaxing the rule for the next few budget cycles to see if there is a difference in behavior and expenditures levels. It should start by assessing how these patterns changed in FY 2018 when the rule was relaxed to 75/25 because of the delayed appropriations.	**Yes**
177	**RL110**	110.3	**Accelerate Reprogramming and Transfers.** As indicated by previous Heritage research, reprogramming requests are lengthy processes that pass through multiple layers of approval in the executive and legislative branches. A more agile reprogramming process would reduce the incentive for the Department of Defense's financial managers to obligate every single dollar before expiration by allowing it to be moved to higher priorities if the missions of lower priority can be executed with fewer resources. An important part of the pressure that creates the "use-it-or-lose-it" mentality is the thought that the appropriated resources will not be put to their legally appropriated uses. A faster reprogramming process would alleviate that mentality through the creation of a viable avenue to move resources that are about to expire into higher priority items.	**Yes**
178	**RL107**	107.1	Review acquisition policies designed for "fairness" to determine if a waiver process or other approach is needed to speed up acquisitions for sole source and other approaches for "speed" where a competition may not provide cost savings or provide significant innovations.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
179	**RL97**	97.1	A realistic improvement that Congress and the Department could pursue is expanding the Extensible Markup Language, or XML, feature (introduced to the DoD between 2010 and 2011) to all of the DoD's programs. With an XML feature, an analyst can download budget data documents and leverage the XML data structure, which extracts, groups, and organizes the data. Currently, the RDT&E and procurement programs are the only DoD budgets that have this capability. In extending this underleveraged capability to the rest of the DoD's budget programs, there is potential for greater accessibility and transparency across the entire defense budget.	**Yes**
180	**RL97**	97.2	DoD [should] adopt an entirely different (and better) platform that could clean up the presentation of budget data materials and allow for more interactive sorting and tagging features so that analysts could search investments by program, capability, or associated concept. Congress has largely failed to follow up with funding or resources to support budget data revision efforts in the past. Congress should fund research and efforts to revise budget documents.	**Yes**
181	**RL97**	97.3	Congress and the DoD needs to also focus on DoD processes and organizational culture to support modernizing and standardizing the presentation of defense budget data.	**Yes**
182	**RL94**	94.1	**Establish a fast-track for low-risk reprogramming requests.** As pointed out by Lieutenant Chad Roum: "Overall, about 85 percent of all prior approval reprogramming requests went unchanged. In general, this shows the defense committees defer to the Defense Department's judgment." This indicates that most requests that reach Congress are justifiable and well-formulated. Further, some are based on the facts of life of running a program. Candreva explains that "'Fact of life' changes are presented by program offices, operational units, and support organizations. These include contingent events like unexpected maintenance requirements, special provisions of law, a contractor breach, operational tempo changes, fuel price changes, and unfavorable test results." Congress and the DoD should define the common characteristics among the requests that are approved without any modifications and highlight those characteristics in any request. There could be a scale of points to determine the political risk of each reprogramming request. This would help Congress to process reprogramming requests faster, and further develop a common language between the two branches of government. There needs to be a more nuanced approach to how both the executive and Congress treat reprogramming requests, which will be derived by understanding the shared characteristics of requests with high approval rates.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
183	**RL94**	94.2	**Provide more detailed justifications and move beyond static data.** The reprogramming requests usually arrive in Congress with the same level of detail as the publicly available forms on reprogramming requests. The DoD should work with Congress to develop a platform that allows congressional staffers to access more detailed and updated data from reprogramming requests. Right now, the Pentagon sends forward static scanned-in copies of forms. Even if the platform and the data are not accessible to the public, they will both help to build confidence in the process and in the data. The platform could also be used to track the status of the reprogramming, from initial request to the multiple layers of approval.	**Yes**
184	**RL94**	94.3	**Accelerate the process in the executive branch.** The lengthiest part of the process is the time involved from getting the request from the program manager until it gets in the hands of the congressional staffer. The multiple layers of approvals and evaluation undoubtedly contribute to the high approval rate that reprogramming currently enjoys. However, there is room to downgrade some of the required approvals into notifications, especially if the reprogramming request is a candidate for the fast track.	**Yes**
185	**RL94**	94.4	**Raise the transfer authority level proposed by the House in the 2021 defense appropriations bill.** In its 2021 defense appropriations bill, the House proposed cutting transfer authority to $1.9 billion. Based on history, that amount is clearly insufficient and will have deleterious impacts on the national defense.	**Yes**
186	**RL94**	94.5	**Test different reprogramming thresholds.** The thresholds for reprogramming and levels of general transfer authority have not changed substantially in a long time. Congress should grant more flexibility in different areas in order to see how the financial management community at the DoD reacts and uses those authorities. In recent years, GTA peaked at 1.6 percent of the budget in 2016, and has consistently declined afterwards, currently standing at under 1 percent. Congress should raise it to 2 percent of the budget, which would be around $14 billion per year, for two consecutive fiscal years and evaluate the results	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
187	**RL93**	93.1	DoD managers face pressure to spend all their allotted funding lest their superiors, or Congress, feel that they do not really need the money and reduce their future budgets. DoD needs to make better use of cost data in order to identify areas where efficiencies can be obtained. "Finally, Congress sometimes blocks DoD efficiency initiatives, as they have recently done with base closures, because they could lead to job losses. For all these reasons, the Pentagon struggles to execute budgets efficiently."	**Yes**
188	**RL42**	42.1	**Further lower the acquisition process noise via the NDAA law changes** by putting the PEOs and PMs back under system commands or a single senior military acquisition head reporting to both the Service Chiefs and the CAE. Such a change would empower military leaders to get more engaged in acquisition activities while giving them the new tools of Middle-Tier acquisition to push major program acquisition back toward the post WWII timelines.	**Yes**
189	**RL42**	42.2	**Incorporate low-noise acquisition practices with AI.** Given the near-peer pressure on the military adoption of AI, this is an area that needs a low-noise acquisition channel if it is going to effectively help introduce AI capabilities into military platforms, command and control systems, and weapon control systems.	**Yes**
190	**RL135**	135.1	**DepSecDef Designate Office for Gathering and Promulgating Flexibilities Data:** The Secretary of Defense should ensure the Deputy Secretary of Defense designates a primary office responsible to regularly collect current information about the financial flexibilities that are available to support DoD's research and development, innovation, and modernization efforts and ensures the office makes the information easily accessible Department-wide.	**Yes**
191	**RL135**	135.2	**USD(R&E) Develop Guidance for Defense Research Laboratory Modernization:** The Secretary of Defense should ensure the Under Secretary of Defense for Research & Engineering develops guidance for the Defense Research Laboratory Modernization program that communicates the purpose, roles and responsibilities, time frames, procedures, and other relevant information needed to effectively implement this flexibility.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
192	**RL135**	135.3	**USD(A&S) Develop Evaluation Plan for BA-8 Pilots:** The Secretary of Defense should ensure the Under Secretary of Defense for Acquisition & Sustainment implements an evaluation plan, developed using leading practices for pilot design for assessing the effectiveness of the Software and Digital Technology Pilot Programs, also known as Budget Activity Eight (BA-8).	**Yes**
193	**RL91**	91.1	**Adopt 809 Panel regarding portfolio-centric model vs program centric model**, namely: Defense acquisition should transition from a program-centric model to a portfolio model will enable the agile, flexible, and decentralized organization DoD needs. To reduce decision delay time and unnecessary workarounds and inefficiencies seen in the current system, the PAE would be empowered with roles and responsibilities, including resources, programming, budgeting, and acquisition authorities. The PAE's ability to integrate, manage, and execute programs within the portfolio would provide the necessary flexibility, agility, and increased lethality required to be responsive to evolving threats and technology. The PAE would optimize cost and schedule and manage risks across the portfolio to maximize mission impact of the portfolio's capabilities.	**N/A**
194	**RL91**	91.2	**Capture enduring portfolio-level requirements and measures** that are aligned with the Joint Capability Areas or the new Joint Warfighting Concepts.	**Yes**
195	**RL91**	91.3	**Use prioritized backlogs for subordinate capability requirements** to manage the dynamic modular suite of systems and services. Leading commercial technologies drive novel operational practices and capability requirements.	**Yes**
196	**RL91**	91.4	**Use portfolio requirements and measures focus future government and industry research.** A portfolio requirements executive for each portfolio would continually align requirements with evolving strategic direction, threats, technologies, and operations.	**Yes**
197	**RL91**	91.5	**Budgets aligned to the new portfolio structure** instead of thousands of program elements. Putting in place clear accounting and transparency across the major platforms, programs, projects, research, and infrastructure within each budget line item. Portfolios would be designed to have the flexibility necessary to shift funding among programs and activities as priorities, performance, risks, threats, and opportunities change.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
198	**RL91**	91.6	**Shift and scale best practices from recent budget activity**, such as BA 8 software pilot program funding. Doing away with use-or-lose spending, instead focusing on maximizing "ROI" or mission impact.	**Yes**
199	**RL91**	91.7	**Use portfolio roadmaps** to align requirements, budgets, and acquisitions over the short and long term. Portfolio budget executives collaborate with senior leadership to manage budget planning and execution across their respective areas of expertise.	**Yes**
200	**RL91**	91.8	**Leverage an innovation pipeline tuned to each portfolio's specific needs.** DoD lab research and commercial solutions across the National Security Innovation Base would fuel suites of new portfolio capabilities. Portfolio research directors would then be able to engage the innovation hubs and operational commands to shape strategies, investments, partnerships, and experimentation environments.	**Yes**
201	**RL91**	91.9	**Make PEOs responsible** for delivering integrated suites of capabilities to maximize portfolio measures. PEOs will develop portfolio strategies, processes, and contracts to maximize competition and enable the delivery of better capabilities sooner. Programs would no longer be locked into APBs. The key measures would include how each capability maximizes portfolio measures and mission impact. To that end, PEOs would be renamed Portfolio Acquisition Executives to align with their new requirements and budget peers.	**Yes**
202	**RL88**	88.1	**Congress needs to fix itself** and provide stable funding beyond one-year budget cycles and remove threats of continuing resolutions and "shut-downs."	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
203	**RL43**	43.1	**Action One: Use Appropriate Forms of Competition During All Phases of Acquisition.** Competition provides incentives to not only reduce costs, but equally important, to produce higher performance and higher quality products faster, while focusing more attention on customer needs. Using appropriate forms of competition throughout the acquisition cycle will help ensure that its significant benefits are realized. The administration has emphasized the use of competitive contracting, and within DoD, the initial Better Buying Power initiative mandated that all service contracts be recompeted every three years (independent of performance and costs achieved). This, however, creates a disincentive for firms to make investments that will improve the program's performance. As a result, this mandatory re-competition would constrain innovation and, ultimately, increase program costs unnecessarily. Competition should not be for its own sake but should be used as an incentive for higher performance at lower costs. In the above case, it could result in the winner getting a follow-on award (i.e., re-ward) after three years, if they actually got higher performance at lower-and-lower costs.	**Yes**
204	**RL43**	43.2	**Action Two: Improve the Effectiveness of Indefinite Delivery/Indefinite-Quantity Contracts.** First, organizations should strive to provide a real two-step process for services, selecting no more than five (and preferably only two or three) well-qualified providers for a narrowly scoped requirement area. Second, government agencies, DoD in particular, should work to reduce the number and scope of IDIQ contracts—a smaller number of the contracts could be used more frequently, with more rigorous oversight. Third, organizations should ensure there are adequate timetables for proposal preparation. If there are more than two or three firms, the government should not require all contractors to bid on every task order. Currently, firms spending money on unsuccessful proposals raise their overhead costs to the government, making them less competitive and more expensive overall.	**Yes**

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205	**RL43**	43.3	**Action Three: Use a Best Value Tradeoff Selection Strategy for Complex and Most High-Knowledge-Content Work.** The FAR identifies the "lowest price technically acceptable" (LPTA) process as suitable when the government is expected to receive the best value by selecting the technically acceptable proposal with the lowest evaluated price (FAR, 2011). As a result, LPTA has successfully been used for the purchase of items that are commodities, where there is little performance or quality difference among competing offerings. Many organizations within DoD, however, have responded to the budgetary pressure by emphasizing the use of LPTA for source selections on differentiated goods and services. Since there is often mission value in providing solutions above the minimum prescribed, when contracting for complex goods and professional services (e.g., industry-developed innovations, more qualified personnel, and long-term cost reductions) for these acquisitions, the cost/performance tradeoff source selection is the better choice.	**No**
206	**RL43**	43.4	**Action Four: Use Cost-Reimbursable Contracts for System Development.** DoD periodically embraces fixed-price development contracts in its effort to control cost growth and shift more of the responsibility and risk to the contractor. Contrary to popular belief, the use of fixed-price contracts during development of major defense acquisition programs (MDAPs) may not eliminate, or even reduce, cost overruns. In fact, fixed-price development contracts have often resulted in significant cost growth. DoD MDAPs are often associated with a high level of uncertainty that may stem from a variety of sources, including the use of immature technologies or budgetary challenges (e.g., stretch-outs of funding), and the need to make changes (to meet changing mission requirements) as the design matures. Consequently, DoD should rely on cost-reimbursement contracts for system development.	**No**

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207	**RL43**	43.5	**Action Five: Remove Barriers to Buying Commercial Products and to Dual-Use Industrial Operations.** Combining civil and military industrial activities (from engineering through production and support) has the potential for very large economies of scale, along with more rapid technology transfer of both product and process technologies between the sectors. The U.S., however, has explicit acquisition policies that greatly discourage dual-use industrial operations (e.g., specialized cost accounting requirements) that result in added costs to products and services. As a result, this policy forces most firms to separate their government and commercial operations. Similarly, export controls discourage commercial firms from doing defense work. Because of such legislative and regulatory barriers, the U.S. loses the economic and security benefits of dual-use operations. DoD should work to reduce these barriers and leverage the benefits of buying commercial products and services.	**Yes**
208	**RL43**	43.6	**Action Six: Where Possible, Reduce the Government Monopoly through Public/Private Competitions (on Non-Inherently Governmental Work).** Congress has effectively directed an end to all public/private competitions, although an extensive history, with thousands of cases, demonstrates that these competitions produce average savings of over 30 percent—regardless of which sector wins. During President Obama's first term, both the White House and the Pentagon took the opposite approach and began aggressively pushing for bringing work in-house (a process known as insourcing). DoD proposed to insource over 33,000 positions, with the belief that this initiative would save up to $44 billion annually (based on the incorrect comparison of the hourly pay of government employees to the fully loaded prices of industry workers). When the insourcing was not producing the anticipated cost savings, it was cancelled by then-Secretary of Defense Robert Gates. The critical issue with regard to whether the work should be done in the public or private sector, however, is the presence or absence of the cost and performance incentives introduced by competition—whether this is private vs. private, or public vs. private competition—and only applied when the work to be accomplished is not inherently governmental (i.e., commercial).	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
209	**RL43**	43.7	**Action Seven: DoD Should Work to Realize the Benefits of Globalization, Both Economic and Security.** Today, technology, industry, and labor are globalized; and in many areas, the U.S. no longer is the technological leader. In order for the 21st-century defense industrial base to remain cognizant of all emerging technologies, defense firms must have the ability to openly interact with U.S. allies and trading partners. This globalized defense market will not only aid the U.S. in the development of advanced military capabilities, but it will also contribute to the expansion of domestic commercial technologies, strengthening political and military ties, and providing significant economic benefits. The U.S. must gain the benefits from globalization, but today there are laws, policies, and practices that are barriers to these economic and security benefits.	**Yes**
210	**RL43**	43.8	**Action Eight: Recruit and Retain a World-Class Acquisition Workforce.** DoD's civilian acquisition workforce is not currently adequate to meet the needs of the 21st century. Moreover, a majority of the personnel are approaching or have already reached retirement age, and the new hires are not adequate in number nor sufficiently experienced to replace outgoing workers. Nor are there mentors available to guide them. As DoD's weapons systems, and their support structure, become more complex, the need for highly skilled acquisition personnel becomes even more vital. Consequently, DoD requires an acquisition workforce with the needed skillset. This skillset includes cutting-edge technical, analytical, and management knowledge and experience, as well as a full understanding of industry operations and incentives.	**Yes**
211	**RL86**	86.1	**Requirements.** Focus on short statements of outcomes to increase flexibility in solution design and allow for requirements iteration over time. As a result, requirements stay aligned with technical progress and user feedback is enabled by an open channel with stakeholders.	**Yes**
212	**RL86**	86.2	**Market Research.** Develop an organizational capability for continuously engaging with industry to identify technologies and vendors that can increase program value. As a result, the program is continually scanning the market for vendors as appropriate.	**Yes**
213	**RL86**	86.3	**Master the Baseline.** Determine which system elements are technically separable and pursue traditional contracting approaches for technologies with slower cycle times and modular contracts for faster moving applications. As a result, the program is not being built full-stack in a single contract award and new capabilities are released at differing speeds.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
214	**RL86**	86.4	**Agile Work Statements.** Separate technical direction from contract requirements and use a living roadmap adjusted to the product backlog and user feedback. As a result, contractors are held accountable for delivery and integration through a disciplined process.	**Yes**
215	**RL86**	86.5	**Modular Contracts.** On-board with broad and flexible solicitations, transition to multiple award contract vehicles with recurring task orders and streamlined procedures. As a result, outcomes from one phase provide inputs to the next, and contractors do not feel like they are in proposal-mode all the time.	**Yes**
216	**RL86**	86.6	**Intellectual Property.** Rather than focus on specific standards, influence a microservices architecture with rights to interfaces and operational data. As a result, vendors can be onboarded quickly if needed, particularly at the application and data layers, and keep IP to their "black boxes."	**Yes**
217	**RL77**	77.1	**Start with modern, Fortune 500-tested financial planning processes.** After 60+ years of tinkering, PPBE has become slow, complex, byzantine, and rigid. Any effort to reform it will anchor to the current inefficient state, producing only minor change. The core, broken process will remain intact. It was designed for cold war strategy with a static enemy and supported by an industrial age economy. The game is played differently now. We now face asymmetrical threats and whole-of-country competition in an information age economy. That calls for budget approaches that integrate across traditional administrative and funding silos. It calls for the ability to respond to multi-dimensional, global competition and threats that change daily. We need a wholly new process that is standard for the entire DoD and the whole of Federal government. Today's Fortune 500-tested financial planning processes have a proven track record of allocating resources well against major systemic changes. These software-based processes support multi-dimensional competition. We need a digital POM so let's get PPBE tuned for software.	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
218	**RL77**	77.2	**Eliminate the "color of money."** When PPBE (PPBS) was created, budgets were dominated by hardware for weapons platforms. It made sense to have different appropriations corresponding to hardware acquisition lifecycle phases – from Research and Development (R&D) through to Operations and Maintenance (O&M). But now the performance of many weapon systems is determined by software. As DepSecDef Hicks has pointed out, delivering a more lethal force requires the ability to evolve faster and be more adaptable than our adversaries. The DoD's adaptability increasingly relies on software. The ability to securely and rapidly deliver resilient software capability is a competitive advantage that will define future conflicts. Today's best practices in agile software engineering make those old hardware lifecycle phases irrelevant. Instead, tie money to purpose with agility in how resources are applied, and without artificial barriers. This will eliminate the need for omnibus reprogramming activities at the end of the fiscal year.	**Yes**
219	**RL77**	77.3	**Decentralize Finance/Resource Allocation:** Just as DeFi is taking over banking, Decentralized Resource Allocation (DeRA) should drive any future PPBE initiatives. While Joint Operators at all levels embrace the concept of "Commander's Intent" for mission execution, the DoD has failed to embrace the same concept for resource allocation. Moving to a more Decentralized Resource Allocation and Execution process will empower users at the lowest levels to make data-driven, fiscally informed decisions that support Commanders Intent. This will ensure that limited resources are executed both efficiently and effectively. Coupled with improved visibility, DeRA will allow the DoD to finally become more agile and responsive to emerging threats and risk to mission. DeRA will provide a consensus mechanism that performs in real time what the PPBE mechanisms like CEBs and JROCs attempt and budget review processes attempt to do bureaucratically on the POM/budget cycle. This requires technology and integrated software platforms that ensure enterprise-wide alignment of priorities, resources, and approvals in real-time.	**Yes**
220	**RL77**	77.4	**Shift the focus of PPBE from inputs ($s) to National Defense Strategy outcomes.** Today PPBE is focused on the management of inputs, especially budget $s to DoD operations. This is a useful discipline. However, taxpayers care far more about getting results-for-money (or, return on investment (ROI)). The current PPBE process is ill-equipped to even identify, let alone optimize results. Let's get accountability front-and-center. It's time to refocus PPBE on performance management, including prioritizing the outputs and goals of the National Defense Strategy at each step in the process, with evidence-based indicators of effectiveness and other outcomes.	**Yes**

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221	**RL77**	77.5	**Expand the charter of the expert commission beyond process.** Yes, the process needs to be addressed. But real transformation will require changes to people and culture, policy and authorities, partners and IT platforms. Focusing narrowly on process, without these other dimensions, is a sure path to the status quo. We need a comprehensive roadmap for complete transformation of PPBE.	**No**
222	**RL73**	73.1	**Expand digitalization into more capability and technology areas**, including new development efforts and sustainment of current forces. Office of the Secretary of Defense organizations like Research and Engineering, Acquisition and Sustainment, and Cost Assessment and Program Evaluation could provide priorities for expansion while the Military Departments identify specific programs. The PPBE Commission could focus on expanding business practice innovation like digital transformation in its reform recommendations.	**Yes**
223	**RL73**	73.2	**Incentivize industry by valuing advanced practices when writing proposal requests**, making award selections, and issuing contracts. Program offices will need more experts in evaluating and using digital twins and the digital thread from development through sustainment. The cost-estimating community should look at commercial industry to learn what is possible, and how this might realistically change defense programs.	**Yes**
224	**RL73**	73.3	**Smooth industry's path by standardizing material requirements and accelerating certification** of printed parts. It should also establish intellectual property policies that protect DoD while incentivizing industry investment.	**Yes**
225	**RL70**	70.1	**Rebuild Strategic Analysis.** *[Cut discussion on the current short falls then provided the last paragraph.]* There are multiple ways to rebuild and reform the planning phase of PPBE, none of which will be easy. It may be necessary to designate a first-among-equals as the lead, putting them in charge of marshalling the efforts of the three offices to produce consolidated Defense Planning Guidance. More broadly, the role should be expanded to a larger strategic integration role supporting the Secretary and Deputy Secretary on NDS implementation and the coordination of strategic-level processes across the Department. But there are other options, and the commission should review them all. The important point is that PPBE can't work if the first "P" is silent.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
226	**RL70**	70.2	**Improve Agility in Allocating Resources. *[unnecessary arguments removed from the recommendation.]*** Creating a more agile system for rapid technology adoption will require changes within DoD, but also changes in Congress—this is reform that will most likely require legislative alterations. There are many basic reforms that DoD can implement as it develops the president's budget submission, such as broadening research and development accounts to allow for more flexibility within them (Congress can always reverse these changes in their appropriations bill if the Department overreaches). On the congressional side, appropriations will have to become more flexible. Since the appropriators, understandably, do not want to give up their oversight and control of resources, this means that the increase in flexibility should be accomplished in a way that complements rather than dilutes congressional oversight. For this challenge, however, it is also important to note that PPBE reform, like acquisition reform, is an enabler for accelerating modernization but does not accomplish it by itself. It is necessary, but not sufficient. To accelerate modernization, DoD must change how it operates and engages with industry to purchase technology. DoD must adopt modern business practices like "as-a-service" purchasing of technology and digital transformation. ***The following 4 recommendations (227 through 230) are paraphrased from call-out boxes.***	**N/A**
227	**RL70**	70.3	**As-a-Service Acquisition Model.** DoD has historically been the primary buyer, e.g., space satellites for intelligence and surveillance, stealth technology for fighter aircraft, and tracked combat vehicles. In these markets, with a monopsony buyer purchasing from one or a very small number of sellers, DoD bears the full cost of technology development and sustainment. This is true if DoD owned and operated the system or had the defense contractor play this role. Key technologies of interest to DoD today like artificial intelligence, biotechnology, and unmanned systems have large commercial markets and the private sector is the primary driver of technological advancement. Even advances in space capabilities like imaging, data transport, and communication are now primarily driven by private investment. The "as-a-service" acquisition model allows DoD to leverage commercial technological investment and advancement. It moves technology acquisition from a large, fixed cost in investment accounts to a variable cost in operating accounts. It also allows DoD to share the cost of technology development and refresh with other customers, allowing DoD to improve technology at the pace of civilian advancement instead of being locked into a legacy system for decades.	**No**

#	Ref ID	Ref #	Recommendation made:	Actionable?
228	**RL70**	70.4	**Digital Transformation.** Digitalization along the product development lifecycle can accelerate timeline and reduce cost. In product development, digital transformation allows faster and more flexible design iterations—shortening the process while improving alignment to mission need—by moving more activities into the digital space with a "digital twin." Digitally engineered designs can then move more quickly through prototyping, testing, and production as the digital twin provides the data for printing initial parts, incorporating modifications, and feeding robotic and additive manufacturing processes. This "digital thread" integrates the product development lifecycle. Testing can be enhanced, and risk reduced as thousands of "digital tests" are conducted to complement physical tests.	**No**
229	**RL70**	70.5	**Valley of Death.** The product development lifecycle can be divided into three primary steps: science and technology (S&T), development, and production. When a capability gap is identified, if it requires new technology, the first step is likely S&T funding for scientists and technologist. Once the technology is mature, DoD provides development funding to turn it into an actual product with prototypes and tests. Once a product is developed, it is then produced and deployed. These steps are usually conducted by separate organizations with separate budgetary accounts. The valley of death is generally caused by the "upstream" organization failing to coordinate and have buy-in from the "downstream" receiving organization before initiating the project. Best practice is to have a technology transition agreement signed by all three phases before initiation of a project. And if the S&T or development project has been leadership directed as a "forcing function" for deploying community to modernize faster, then the leadership needs to use the programming process to also direct the downstream funding. A new valley of death challenge is emerging. In this case, a startup company funded by private investors may develop a new technology (with little or no DoD funding or visibility). As that technology matures, the startup company needs to develop a customer base with contracts to be competitive for a follow-on round of funding. But unless the company coordinated with DoD early in the process, DoD is now seeing the technology for the first time as it is ready to transition [... 70.6]	**N/A**

#	Ref ID	Ref #	Recommendation made:	Actionable?
230	**RL70**	70.6	[70.5...] This is a core flexibility and agility challenge being faced in DoD. DoD does not know which technologies will receive funding and mature the fastest in the private sector and, thus, does not know where to put the funding in the programming and budgeting phases. It is important to note, however, that this is an execution challenge and not a programming and budgeting challenge—any DoD budget formulation process, PPBE or otherwise, will have the same cut-off date for realigning funding across accounts prior to congressional submission. Execution solutions include as-a-service purchasing and broadening appropriation accounts. This is an important challenge for the Commission to address.	**No**
231	**RL70**	70.7	**Use Realized Performance Data.** Increase the use of program evaluation and performance data in the PPBE process. The DoD does create a wealth of data that can inform decision making, including exercise results, test and evaluation data, modeling and simulation data, and, for the combat support and business operations functions that are executed every day, realized execution data. With annual full-scope financial statement audits well underway, the pieces are now in place for major improvement. CAPE leads the programming phase of the PPBE system and two of its four key deputates are primarily focused on analysis in support of programming. A third deputate focuses on strategic analyses in support of the planning phase. Almost all of the analysis performed by these three deputates is some variation of simulation using physics or engineering-based models. There is very little empirical analysis on realized performance and financial data. One innovation that has helped control this problem is requiring independent cost estimates that use realized cost data. CAPE leads this function and oversees this requirement for DoD. The three cost estimating divisions have developed sophisticated empirical models that use historic costs on similar systems to estimate the likely cost of a new system. Although this model serves DoD well, it could be argued that the cost estimators are too rigid in the opposite way from the rest of CAPE. By relying solely on historic data, the cost estimators don't take into account new manufacturing innovations like digital transformation discussed above until they have already been used on enough systems to show up in their data sets of historic acquisitions. Although CAPE was used to illustrate the challenge, the ineffective use of experiential data is pervasive across the PPBE system. Solving this problem will require a directed focus on realized performance data. This could be implemented many ways. One simple incremental step would simply be to focus hiring decisions to bringing into CAPE and other organizations some statisticians and econometricians.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
232	**RL44**	44.1	**The Pentagon needs stable lines of funding** that can accommodate the open-ended nature of an evolutionary development. The Department's newly proposed Rapid Defense Experimentation Reserve is a step in the right direction. To do better than previous attempts, it would need to be structured to provide current year funding for any type of appropriation aligned with joint and combatant command needs.	**Yes**
233	**RL44**	44.2	**The Pentagon needs business systems that can track metrics** for information-age military capability to keep up with the speed of continuous development and enable effective oversight. The Advancing Analytics capability, initially developed to support the Department's full financial statement audit, has the potential to meet this need when fully implemented.	**Yes**
234	**RL44**	44.3	**The Pentagon needs congressional support** to modernize the Planning, Programming, Budgeting and Execution (PPBE) process to match acquisition reforms made over the last decade with agile, responsive, and transparent funding not tied to a specific stage in development or fiscal year.	**Yes**
235	**RL46**	46.1	The Secretary of Defense should ensure the Under Secretary of Defense for Acquisition and Sustainment fully implements leading reform practices in the area of leadership focus and attention while developing the reporting system that will replace the Selected Acquisition Report requirements, such as by **creating a dedicated implementation team** that has the capacity, including staffing and resources, to manage the reform process.	**Yes**
236	**RL46**	46.2	The Secretary of Defense should ensure the Under Secretary of Defense for Acquisition and Sustainment fully implements leading reform practices in the area of managing and monitoring reforms while developing the reporting system that will replace the Selected Acquisition Report requirements, such as by **developing an implementation plan with key milestones and deliverables.**	**Yes**
237	**RL47**	47.1	**Congress and the DoD should cooperate to promptly launch a limited-scope pilot project on an alternative resource allocation process, designed to foster adaptability in capability delivery and aligned around a high-priority national security operational challenge.** Other pilots should also be considered.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
238	**RL47**	47.2	**In parallel with one or more budget pilots, Congress or the DoD should sponsor a commission to study holistic changes to the PPBE and appropriations process structured to ensure that the U.S. has a competitive advantage in long-term competition while maintaining Congress constitutional role.** This commission should include expert members with an understanding of current equities and limitations, and explore emerging concepts potentially including portfolio, organization, mission, and trusted-agent budgeting. This commission may extend its scope to cover critical capability timeline drivers including contracting and early investment decisions that also touch upon adaptability.	N/A
239	**RL47**	47.3	**The policy and research community should conduct comparative analyses of the bureaucratic research allocation processes between the U.S. and China, especially focusing on the early decision-making processes associated with starting investments in new military capability and strategic priority setting.**	Yes
240	**RL58**	58.1	**Key equities and tensions between the DoD and Congress should be identified and relevant stakeholders such as the PPBE Commission and the Comptroller should be engaged** answering questions such as, "How can DoD simplify financial management within the law?" and "What are appropriation outcomes that both the DoD and Congress are seeking?"	Yes
241	**RL58**	58.2	**Equities and perspectives affect budgetary actions and appropriation structures.** Thus, try to address equities as a package when seeking more responsive appropriation approaches.	Yes
242	**RL58**	58.3	**Accept tension between mission and politics of spending.** It is important to clearly convey mission effects (not just program performance) to strengthen mission equity in decisions.	Yes
243	**RL58**	58.4	**Accept tension between annual Congressional control and procurement responsiveness.** Accept that control (at some level) is important. Gaining DoD ability to gain longer-term efficiencies and responsively deal with unexpected, short-term needs may require compensating along Congress' other equities.	Yes
244	**RL58**	58.5	**Accept inherent tension between current and future needs.** Balance is needed. Insight and ability to strategically control this balance must be maintained.	Yes

#	Ref ID	Ref #	Recommendation made:	Actionable?
245	**RL57**	57.1	**General recommendations about agility in acquisitions.** Few agility approaches are universally applicable. The right one for a given acquisition depends on the conditions for application, the domains involved (e.g., requirements, budgeting, acquisition), and issues with implementation. Many approaches are tried and true and require no special authorities to implement. Agility depends not just on acquisition but also on requirements, budgeting, technology, and intelligence activities. Speed could still involve compromise in cost or technical performance objectives.	**No**
246	**RL57**	57.2	**Opportunities with agility in acquisition.** Program managers and stakeholders can use the PAF-developed spreadsheet tool (as seen in RL57) to identify relevant agile approaches when developing acquisition strategies or structuring organizations. Investment in workforce expertise and experience, ready availability of financial resources, and a willingness to accept operational capabilities incrementally are important factors in agility, in addition to process improvements.	**Yes**
247	**RL55**	55.1	**Make bets and bridge funds towards AI as a portfolio, as recommended by Courtney Barno.** It is a ubiquitous technology that is only growing in usefulness and effectiveness from 2021 (and especially now in 2023). The government must take bets on up-and-coming technologies even where there is no physical money to do so as a near-term solution. In the long-term, we must make pilots on portfolio management (generally), gather ideas and data from them, and share insights with Congress, which may hopefully get us closer to achieving better metrics to measuring value.	**Yes**
248	**RL65**	65.1	**Acquisition oversight must be returned to Service level military control where speed to capability is a cultural imperative.**	**Yes**
249	**RL65**	65.2	**Cyber security and resilience must be continuously verified rather than pacified by paper processes that leave developing and operational systems vulnerable to hackers.**	**Yes**
250	**RL65**	65.3	**High checker to doer ratio must be reversed to mitigate oversight second guessing by enabling trusted, but accountable, short decision cycles.**	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
251	**RL118**	118.1	**Integrate existing technologies now: Network DoD's digital innovation initiatives to scale impact.** A number of the Department's innovation organizations have delivered results. But they are uncoordinated and under-resourced. DoD signaling of technology priorities is ad hoc and is not supported by a track record of significant DoD investments in digital technology with non-traditional vendors. As a result, national security AI applications attract less private-market investment. The Department should harmonize its innovation initiatives to carry out a coordinated strategy for commercial technology solutions. The Under Secretary of Defense for Research and Engineering should direct this effort.	**Yes**
252	**RL118**	118.2	**Reform leadership structures.** Leadership is the critical variable. Driving innovation requires organizational change, not just technical capacity. Senior civilian and military officials should set clear priorities and direction, empower subordinates, and accept higher uncertainty and risk in pursuing new technologies. Specifically, DoD should: • Establish a high-level Steering Committee on Emerging Technology, tri-chaired by the Deputy Secretary of Defense, the Vice Chairman of the Joint Chiefs of Staff, and the Principal Deputy Director of National Intelligence. • Ensure the JAIC Director remains a three-star general or flag officer with significant operational experience who reports directly to the Secretary or Deputy Secretary. • Appoint the Under Secretary of Defense for Research and Engineering as the co-chair and chief science advisor to the Joint Requirements Oversight Council.	**Yes**
253	**RL136**	136.1	**DoD should enhance existing ways and create new ways to bring disruptive technologies into the Department of Defense.** The current process of reverse engineering a requirement for technology that already exists fails to acknowledge that more and more technology with military applications is being developed outside of the Department itself. The requirements process should create new pathways both to identify these technologies and to bring them into the system without the pretense of backing into a need for a thing that is already out in the public domain. The Department should also consider ways to write requirements for software that allow it to evolve at the pace of commercial technology.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
254	**RL136**	136.2	**DoD should increase transparency in the requirements process while maintaining ethical boundaries.** The Department should pursue ways to engage in dialogues with the private sector—both traditional and nontraditional industry partners—throughout the requirements-generation process, while also preserving the integrity of the process's outcomes. These means must be transparent to all stakeholders to guard against improper influence over requirements decisions. The custodians of the process should also seek to more fully engage experts within the Department, for example, by taking annual briefings from DoD labs or others engaged with the tech sector.	**Yes**
255	**RL136**	136.3	**Congress should reorganize appropriations titles (the "color of money") to reflect the kind of life cycle a thing has, not what part of the life cycle a thing is in.** Congress appropriates funding for weapons systems by title depending on what phase of the life cycle that weapons system is in: 1) research, development, test, and evaluation; 2) procurement; or 3) sustainment funded in operations and maintenance. This way of organizing appropriations creates major delays when a system transitions from the developmental stage to procurement; it takes 18 to 24 months to get the right color of money to begin procuring a promising developmental system at scale. Instead, Congress should consider appropriating funds for the full life cycle of a given weapons system according to the kind of life cycle it has: 1) enduring systems, such as ships and aircraft; 2) evolving systems, such as software; and 3) expendable systems, such as attritable drones and munitions. Reorganizing appropriations titles along these lines would preserve robust congressional oversight while also allowing the Department to more easily move programs from development into production, as it would no longer require different colors of money. It would also allow DoD to more easily make funding decisions in the year of execution based on what that system needs, whether it be more maintenance to improve availability (currently funded by operations and maintenance) or follow-on modernization to update its technology (currently funded in research and development and/or procurement). This proposed reorganization would have the added benefit of creating more transparency around the full life cycle cost of weapons systems by putting that complete life cycle into a single appropriations account. It could also increase transparency in the Department's operations budget, by shifting sustainment costs into the same titles in which the weapons systems are developed and acquired, thus revealing what the true cost of U.S. military operations are in a given year.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
256	**RL136**	136.4	**When delivering fiscal guidance to the services, the secretary of defense should hold back some resources to be allocated at the end of the process (a real and transparent "bishop's fund") and use it to harness interservice competition as a force for good.** Each year, OSD provides the services with their fiscal guidance for the upcoming programming cycle, which tells them how much money they have to work with in preparing their programs for the coming fiscal year. The services have long accused OSD of holding back some resources, creating a "bishop's fund" to distribute during program review. The secretary should create a "competitive advantage fund" explicitly and transparently. Along with the annual fiscal guidance, the secretary should provide the services with a specific set of operational challenges (e.g., sinking a certain number of ships in a specific geographical area within a specific time frame) During program review, the services would present their solutions, and the service or services that came up with the best solution to a given challenge would get the resources to fund that solution. This process would effectively turn the ever-present interservice rivalries for shares of the program from a liability into an asset. It would also make balancing the books at the end of the review process much easier, avoiding the need to search for offsets to fund higher priorities at the last minute.	**Yes**
257	**RL136**	136.5	**DoD should fully implement recent changes in authorities and recommendations for streamlining regulations.** Congress should resist the temptation to undertake substantial new reforms until DoD has done so. The fiscal year 2016 and 2017 NDAAs instituted sweeping changes in acquisition authorities and organization, and these changes will take time to fully implement. Anecdotal evidence indicates that there are instances where the full scope of the new or expanded authorities included in the fiscal year 2016 and 2017 NDAAs has not yet been implemented or, where implemented, has not completely filtered down through the acquisition workforce. The 2017 NDAA's mandate to dramatically reorganize the acquisition enterprise, coming on the heels of the new "middle-tier" authorities promulgated in the 2016 NDAA, means that many acquisition officials were distracted by the mandate to rearrange the deck chairs instead of fully exploring the expanded authorities at their disposal. Congress should allow the Department adequate time to fully digest these reforms, to test them out, to understand their limits, and to identify their shortcomings before pursuing additional reform to the acquisition enterprise.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
258	**RL136**	136.6	**DoD should use these new acquisition authorities to incentivize industry to rapidly adopt and adapt commercial technological developments to military purposes.** The Department must consider the defense industrial base a full partner in sustaining U.S. military technological advantage and, to that end, incentivize the traditional defense industrial base to adopt and adapt commercial technological developments to military purposes. What technology start-ups need to succeed is proof that they can make money, to demonstrate that they can scale. Traditional large defense companies are already providing these things to tech start-ups through venture capital activities, but the Department can and should do more to incentivize defense companies to help solve the innovation adoption problem. By executing contracts using the rapid fielding authorities and new definition of commercial items included in the 2016 NDAA, for example, the Department can successfully incentivize industry to quickly adapt commercial technological developments for military use.	**Yes**
259	**RL136**	136.7	**Pending a determination as to whether the new "middle-tier" and expanded OTA acquisition authorities created by the fiscal year 2016 NDAA provide sufficient flexibility, Congress and DoD should consider developing a regime where there are explicitly different risk tolerances for different types of acquisitions programs.** Under this kind of regime, certain weapons systems programs could be designated as having a potentially significant impact on U.S. military technological advantage; Congress and DoD together could agree to accept a higher degree of risk in terms of cost and schedule for these programs. For example, for a given weapons system with this high impact/high risk designation, Congress could consider creating an exception to WSARA's presumption of termination for programs with critical Nunn-McCurdy breaches. For DoD to undergo a cultural shift that truly promotes risk acceptance in certain cases, both the Department's leadership and the Congress must agree and state explicitly that they will not condemn those responsible when one of these high risk/high reward programs fails. Otherwise, existing incentives to avoid risk (and thus to decline to aggressively pursue immature technologies) will continue to prevail.	**Yes**

#	Ref ID	Ref #	Recommendation made:	Actionable?
260	**RL136**	136.8	**DoD should develop a means of measuring the value of a regulation against the costs of compliance in terms of both time and money. Congress and DoD should use this metric to consider accepting more risk in some regulatory frameworks.** Both Congress and DoD could use a meaningful cost/benefit analysis of compliance with various regulations to set more informed thresholds below which those regulations do not apply, or even to determine that certain regulations are not worth their cost. Doing so could save the taxpayer money while also allowing programs to move faster. It could also lower barriers to entry into the defense sector, thus lowering costs further by increasing competition. While it is true that the Department has studied this issue before with somewhat unsatisfactory results, the time may be ripe to make another attempt given improvements in data management that could provide additional insight into the costs of various regulatory frameworks.	**Yes**
261	**RL136**	136.9	**The deputy secretary of defense and the vice chairman of the Joint Chiefs of Staff should serve as formal integrators of the requirements, programming and budgeting, and acquisition processes.** In fact, the deputy secretary of defense (DSD) and the vice chairman of the Joint Chiefs of Staff (VCJCS) already do a fair amount of integrating across these three processes, because the results of each land on their desks at some point. As a result, formalizing this function would not require much in the way of additional bureaucracy, but it would require existing staffs to acknowledge their role as integrators and work together to provide them with information accordingly. In doing so, formalizing this integration role would also force requirements, programming and budgeting, and acquisitions staffs into a greater state of integration in order to staff their principals effectively. As a first step, DSD and VCJCS could together review the roles and missions of each process and their stewards, with an eye to both reducing duplication of effort and determining where each must be more closely linked.	**Yes**
262	**RL136**	136.10	**Congress and DoD should stop mandating across-the-board headquarters reductions and instead make determinations about where missions can be cut or real efficiencies harvested and reduce staff accordingly in a targeted manner.** There is no doubt that the Department of Defense broadly, and each of these three processes, could be made more efficient. However, repeated rounds of indiscriminate cuts have harmed these processes by eroding talent in the organizations that support them. Future reductions in staff should be taken only when the Department eliminates a mission area or finds genuine efficiencies—ways to do the same work with fewer man-hours.	**Yes**

APPENDIX C. ACTIONABLE RECOMMENDATION CODED THEMES

Table C-1 contains our attempt to characterize the actionable recommendations using qualitative data analysis (QDA) themes.

Table C-1. QDA Coding Themes

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
1.1	Others…	Buy/Use Commercial Technology	
2.1	Budgeting	Portfolio Management and Budgeting	
2.2	Budgeting	PE Consolidation	
2.3	Others…	Reset Reprogramming Authorities	Adopt Historical Norms
2.4	Others…	Nontraditional Industrial Base	
2.5	Others…	Strengthen Capital Market Programs	Enable Pathways for Mission-Critical Technologies
2.6	Others…	Nontraditional Industrial Base	Lower Barriers & Incentives to Tech Companies to Participate
2.7	Budgeting	Data Analytics & Metrics	Modernize Documents
2.8	Budgeting	Bridge Fund for Successfully Demonstrated Technologies	
2.9	Others…	Expand SDA Model	Grant Expanded Authorities for this Model Adoption
2.10	Others…	Requirements	Modernize Process
3.1	Budgeting	Align Work to Primary Mission	Move non-core must pay expenses to entitled funding
3.2	Others…	Align Work to Primary Mission	Prioritize National Security Spending

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
3.3	Budgeting	Modify for Responsiveness to Strategic Priorities	Transparency and Oversight
5.1	Budgeting	Scenario Tools	Innovation & Funding
6.1	Others...	Establish Long-term Forum	Research Contributing Factors to Acquisition Outcomes
6.2	Others...	Analyze PPBE Processes	Review Impacts to Acquisition and Incentives and Disincentives
6.7	Others...	Analyze PPBE Processes	Review Resourcing Processes, Policies and Decisions
7.1	PPBE Commissioners Should	Address Planning Processes Lack of Analytical Framework	Data Analytics & Metrics
7.2	PPBE Commissioners Should	Recommendations Enabling Speed & Agility	
7.3	PPBE Commissioners Should	Civil-Military Integration	Nontraditional Industrial Base
7.5	PPBE Commissioners Should	Predictive Analytics	Retain
7.6	PPBE Commissioners Should	Change Timing/Sequencing	Budget Programs Enabling Capability, Structure & Posture
7.8	PPBE Commissioners Should	Acknowledge Pork Barreling	Budget Delay Effects on PPBE
7.9	PPBE Commissioners Should	Transparency and Oversight	Data Analytics & Metrics
7.10	PPBE Commissioners Should	Transparency and Oversight	Data Analytics & Metrics

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
7.11	PPBE Commissioners Should	Establish PPBE Lessons Learned Feedback Processes	
7.12	PPBE Commissioners Should	Data Analytics & Metrics	Add Retrospective Evaluation Processes
7.14	PPBE Commissioners Should	Rent Technologies with Marketplace Enabled Sustainment	
7.15	PPBE Commissioners Should	Digitally Transform Business Systems	
7.16	PPBE Commissioners Should	Identify Business Accountability Processes	
7.18	PPBE Commissioners Should	Predictive Analytics	Improve
7.19	PPBE Commissioners Should	Data Analytics & Metrics	Strategic Analysis, Speed and Agility
8.1	Budgeting	Transparency and Oversight	Data Analytics & Metrics
8.2	Budgeting	Transparency and Oversight	Data Analytics & Metrics
8.3	Others...	Delegate Authority to Emphasize Speed	
9.1	Budgeting	Portfolio Management and Budgeting	Flexibility
9.2	Budgeting	Portfolio Management and Budgeting	Data Analytics & Metrics
9.3	Budgeting	Portfolio Management and Budgeting	Data Analytics & Metrics
15.1	Budgeting	Evaluate Desired Outcome	
15.2	Others...	Align Work to Primary Mission	Outsource Non-Primary Work
15.3	Workforce	Training & Engagement	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
15.4	Transparency and Oversight	Modernize Budget Alignment	
15.5	Budgeting	Flexibility	
15.6	Budgeting	Capability Budgeting	PE Consolidation
15.7	Budgeting	Flexibility	
15.8	Budgeting	Biennial Performance-Based with Held back Funds Appropriations	Clear Actionable Strategic Program Directions
15.9	Budgeting	POM with Past Performance Decision Assessments	
15.10	Data Analytics & Metrics	Accelerate Single Analytics System Development	
15.11	Data Analytics & Metrics	Revise Structure	
15.12	Budgeting	Strategy Based Funding	Transparency and Oversight
68.1	Others...	Resource Allocation	Funding Agility for Technology Solutions
133.1	Budgeting	Portfolio Management and Budgeting	
133.2	Others...	Implement Review Process for Resource Based Needs	
133.3	Budgeting	Portfolio Management and Budgeting	
133.4	Data Analytics & Metrics	Confidence Level Based Cost, Schedule & Performance	
133.5	Budgeting	Portfolio Management and Budgeting	
133.6	Budgeting	Portfolio Management and Budgeting	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
133.7	Budgeting	Portfolio Management and Budgeting	
17.1	PPBE Commissioners Should	Use Historical View	Commercial Best Practices
17.2	PPBE Commissioners Should	Portfolio Management and Budgeting	
17.3	PPBE Commissioners Should	Portfolio Management and Budgeting	
18.1	PPBE Commissioners Should	Benchmark Current State Against Other Agencies	
18.2	PPBE Commissioners Should	Provide Impactful Recommendations	
18.3	PPBE Commissioners Should	Data Analytics & Metrics	
25.1	Budgeting	Portfolio Management and Budgeting	
27.1	Others...	Rapid Acquisition	Ideas and Barriers
27.2	Others...	Rapid Acquisition	Scalability
27.3	Others...	Establish Task Force Review of Missed Opportunities	Instead of Policies
28.1	Others...	Strengthen Defense Planning Guidance	
28.2	Others...	Reestablish ADCP as a DMAG	
28.3	Budgeting	Congress Reaffirm SECDEF National Strategy Role	
28.4	Others...	Proactively Prioritize Joint Needs	DoD/Pentagon Withholding
28.5	Budgeting	Develop Joint Vision	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
28.6	Budgeting	Collaborative Reviews	
28.7	Budgeting	Joint Reviews	
28.8	Budgeting	Promulgate Special Funds Primer & Details	
28.9	Data Analytics & Metrics	Establish Fund Criteria	
28.10	Data Analytics & Metrics	Evaluate Deterrence Initiatives to CCMND IPL Inputs	
28.11	Budgeting	PE Consolidation	
28.12	Budgeting	Increase BTR Thresholds	
28.13	Budgeting	Innovation & Funding	Enable Flexibilities
28.14	Budgeting	Submit Overbalanced ATR Packages	
28.15	Budgeting	Establish Congressional Mark Adjudication Process	
28.16	Budgeting	Establish FMR Streamlining Committee	
28.17	Budgeting	Expand BA-8 Pilots	
28.18	Budgeting	Portfolio Management and Budgeting	
28.19	Budgeting	Portfolio Management and Budgeting	Provide Operational Effectiveness with Budget
28.20	Budgeting	Portfolio Management and Budgeting	
28.21	Budgeting	Assess DoD-Based V/C-Like Approaches	
28.22	Budgeting	New Investment Category Structure	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
28.23	Transparency and Oversight	Data Analytics & Metrics	
28.24	Transparency and Oversight	Oversight Forum Participation	
32.1	Transparency and Oversight	Wish List Awareness	
32.2	Transparency and Oversight	Thoroughly Evaluated Acquisition prior to Funding	
32.3	Transparency and Oversight	Wish List Awareness	
132.1	Others...	Pilot Efficient Streamlined MDA Processes	Pilot on Selected MDAPs
131.1	Others...	Buy/Use Commercial Technology	
130.1	Budgeting	Portfolio Management and Budgeting	
128.1	Budgeting	Flexibility	
128.2	Others...	Contingency Planning	Worst-Scenario Based Planning
128.3	Others...	Strengthen PPBE Execution Processes	
128.4	Workforce	Risk-Based Role Categorization	
128.5	Workforce	Increase Analytical Staff	
128.6	Others...	Establish Informal Strategic Analysis Forum	
128.7	Workforce	Training & Engagement	PPBE
128.8	Others...	Empower PPBE Process Czar	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
128.9	Others...	Clear, Articulated Leadership Role in PPBE Processes	
128.10	Others...	Standardize PPBE Processes	
134.1	Budgeting	Innovation & Funding	Buy/Use Commercial Technology
134.2	Budgeting	PE Consolidation	
134.3	Budgeting	Revise New Start Approval Process Thresholds	
134.4	Transparency and Oversight	Data Analytics & Metrics	Real-time
126.1	Others...	Empower Senior Leadership Team	Prioritize Military-Technological Edge
126.2	Others...	Empower Senior Leadership Team	Prioritize Military-Technological Edge
126.3	Others...	Empower Senior Leadership Team	Prioritize Military-Technological Edge
126.4	Others...	Strengthen Concept to Fielding Activities	Use Best-in-Class Simulations from Industrial Base
126.5	Others...	Fundamental Scrub of MDAPs	Identify Cost-Based Opportunities
126.6	Budgeting	Innovation & Funding	
126.7	Budgeting	Portfolio Management and Budgeting	
126.8	Workforce	Training & Engagement	Data Analytics & Metrics
126.9	Budgeting	Portfolio Management and Budgeting	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
124.1	Others...	Require AI Readiness in MDAPs	
124.2	Others...	Create Supply Chain Intelligence Center	
124.3	Budgeting	Tax Incentivized Private Sector Investments	Cybersecurity
124.4	Workforce	National Service Programs	Private Sector Tour of Duty
124.5	Workforce	National Service Programs	Private Sector Tour of Duty
124.6	Workforce	Streamlined Clearances for Graduate STEM Degrees	
124.7	Workforce	National Service Programs	Private Sector Tour of Duty
123.1	Budgeting	Flexibility	Multi-Year Funding
121.1	Workforce	Training & Engagement	
120.1	Budgeting	Continuous Block-Based Budget	Model China to Fix DoD Funding
120.2	Others...	Prioritize Customers	CCMND
116.1	Budgeting	Portfolio Management and Budgeting	Innovation & Funding
34.1	Others...	Strategy Based Priorities	
34.2	Workforce	Training & Engagement	
34.3	Workforce	Training & Engagement	
35.1	Others...	Use Customer Focused Cross-Functional Teams Model	
38.2	Others...	Revise Requirements Management Processes	Lack Common Operational Picture

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
38.3	Budgeting	Flexibility	
38.4	Budgeting	Portfolio Management and Budgeting	
38.5	Others...	Buy/Use Commercial Technology	
39.1	Budgeting	Irresponsible Defense Spending Cuts	Focus on Force Readiness & Maintenance
39.2	Others...	Supply Chain Capacity Focus	Reduced Research Focus
39.3	Workforce	Data Analytics & Metrics	Supply Chain
40.1	Others...	Buy/Use Commercial Technology	Innovative Technologies
40.4	Transparency and Oversight	Auditable Business Systems	
110.1	Budgeting	Flexibility	
110.2	Budgeting	Relax 80/20 Obligations Rule	
110.3	Others...	Revise Reprogramming Processes	Prioritize Moves to High Priority Items
107.1	Others...	Waive Competition for No Cost/Innovation Advantage	
97.1	Transparency and Oversight	Data Analytics & Metrics	Format
97.2	Data Analytics & Metrics	Adopt New Analytics Platform	
97.3	Workforce	Culture & Processes	Standardize Budget Data
94.1	Others...	Revise Reprogramming Processes	Analyze Commonality to Accelerate Approvals

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
94.2	Data Analytics & Metrics	Business Systems	
94.3	Others...	Revise Executive Branch Processes	Revise Reprogramming Processes
94.4	Budgeting	Flexibility	Revise GTA Threshold
94.5	Budgeting	Flexibility	Revise GTA Threshold
93.1	Data Analytics & Metrics	Identify Efficiencies	
42.1	Others...	Move PEOs and PMs to System Commands	New MTA Authorities
42.2	Others...	Contracting	Adopt AI Using Low-Noise Contracting
135.1	Data Analytics & Metrics	Promulgate Financial Flexibilities Data	
135.2	Others...	Modernize Defense Research Laboratory	
135.3	Others...	Evaluate Effectiveness of BA-8 Pilots	
91.2	Budgeting	Portfolio Management and Budgeting	
91.3	Others...	Buy/Use Commercial Technology	
91.4	Budgeting	Portfolio Management and Budgeting	
91.5	Budgeting	Portfolio Management and Budgeting	Flexibility
91.6	Budgeting	Adopt BA-8 Like Budgeting	Lose "Use it or Lose it"
91.7	Budgeting	Portfolio Management and Budgeting	
91.8	Budgeting	Portfolio Management and Budgeting	Portfolio Based Innovation Pipeline

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
91.9	Budgeting	Portfolio Management and Budgeting	
43.1	Others...	Appropriate All-Phase Performance Based Competitions	
43.2	Others...	Reduce ID/IQ Contract Scopes	
43.5	Others...	Buy/Use Commercial Technology	
43.6	Workforce	Public/Private Competed Government	
43.7	Others...	Buy/Use Commercial Technology	
43.8	Workforce	Recruit and Retain World-class with Modern Technical, Analytic & Management Skillsets	
86.1	Others...	Use Agile Requirements	Outcome Based Statements
86.2	Others...	Industrial Base	Continuously Identify Vendors
86.3	Others...	Cycle Time Based Contracting	
86.4	Others...	Use Agile Requirements	Statements of Work
86.5	Others...	Modular Multiple Award Contracting	
86.6	Others...	Micro-services Architecture	Intellectual Property (IP)
77.2	Budgeting	Flexibility	
77.3	Others...	Integrated Business Analytics Platforms	Decentralized Resource Allocation
77.4	Others...	Accountability	Optimize PPBE Taxpayer Dollars
73.1	PPBE Commissioners Should	Prioritize Expanding Specific Programs	Expand Digital Transformation

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
73.2	Others...	Digital Engineering	Commercial Best Practices in Cost Estimating
73.3	Others...	Standardize Printed Parts	Establish IP Policies
70.1	PPBE Commissioners Should	Rebuild Strategic Analysis	
70.7	Data Analytics & Metrics	Use Realized Performance Data for PPBE Decision Making	Independent Realized Cost Data
44.1	Budgeting	Stable Funding	Aligned to Joint & CCMND
44.2	Data Analytics & Metrics	Transparency and Oversight	Business System
44.3	Transparency and Oversight	Agile Funding	
46.1	Others...	Dedicated Reform Team	
46.2	Transparency and Oversight	Data Analytics & Metrics	
47.1	Others...	Pilot Alternative Allocation Resource Process	
47.3	Others...	Research China vs U.S. Processes	
58.1	PPBE Commissioners Should	Simplify Financial Management	Agreed to Appropriations Outcomes
58.2	PPBE Commissioners Should	Equities as a Package	
58.3	PPBE Commissioners Should	Accept Tension	
58.4	PPBE Commissioners Should	Accept Tension	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
58.5	PPBE Commissioners Should	Accept Tension	
57.2	Others...	PAF Acquisition Acceleration Tool	
55.1	Budgeting	Portfolio Management and Budgeting	Data Analytics & Metrics
65.1	Others...	Return Acquisition Oversight to Services	
65.2	Others...	Continuous Cybersecurity Verification	
65.3	Transparency and Oversight	Trust Through Oversight Checking	
118.1	Others...	Buy/Use Commercial Technology	Existing (New) Technologies, AI, Digital Innovation
118.2	Others...	Reform Leadership Structure	
136.1	Others...	Buy/Use Commercial Technology	
136.2	Others...	Industrial Base Requirements Transparency	
136.3	Budgeting	Flexibility	Transparency and Oversight
136.4	Budgeting	OSD Transparently Managed Best Solution Fund	
136.5	Others...	Streamline Regulations & Implement Authorities	
136.6	Others...	Buy/Use Commercial Technology	
136.7	Others...	Acquisition Based Risk Tolerance	
136.8	Data Analytics & Metrics	Develop Regulation Value Measurements and Cost for Compliance in Time and Money	
136.9	Others...	Senior Leadership Own & Integrate PPBE Processes	

Ref-#	Primary Theme	Secondary Themes	Tertiary Themes
136.10	Workforce	Stop Mandating Personnel Cuts	Use Efficiency & Mission Based Staff Reductions

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REFERENCES

Congress, FY22 NDAA Section 1004, the wording can be found at: https://ppbereform.senate.gov/section1004-fy22-ndaa/ or in https://www.congress.gov/117/plaws/publ81/PLAW-117publ81.pdf (both last visited on October 26th, 2023)

G. Adams & C. Williams. Buying National Security: How America Plans and Pays for Its Global Role and Safety at Home. Routledge, 2010, pg. 93.