

IBM Center for The Business of Government

# Three Reforms to Improve Defense Resource Management



**John Whitley**  
Institute for Defense Analyses



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# FOREWORD

**On behalf of the IBM Center for The Business of Government, we are pleased to present this report, *Three Reforms to Improve Defense Resource Management*, by John Whitley of the Institute for Defense Analyses.**

With a budget of over \$700 billion per year, the U.S. Department of Defense (DoD) represents the largest discretionary spending agency in the federal government. Attempting to allocate and coordinate these resources to conduct operations, maintain readiness, and invest in modernization presents an enormous undertaking. But directing the allocation of resources enables the Secretary of Defense to establish and exercise control over DoD spending as an essential element of producing a strategy-driven budget.

The DoD process used to allocate and manage resources involves the Planning, Programming, Budgeting, and Execution (PPBE) system established in 1961. Considered a revolution in management at the time, the now sixty-year-old system has proven a powerful and enduring tool for unifying resource allocation decisions, cementing the Secretary's control over department operations, and focusing DoD on the future. The PPBE system has also received frequent criticism for being too bureaucratic, slow, cumbersome, and expensive.

As author John Whitley notes, Congress has now focused on the PPBE system. The 2022 National Defense Authorization Act directed establishment of a PPBE reform commission, tasked with conducting a comprehensive assessment of the efficacy and efficiency of all phases and aspects of the PPBE process.

Whitley's report provides an overview and history of the PPBE system, recommends three key PPBE challenges and identifies obstacles to avoid, all of which the Commission could address. These challenges are:

- The lack of strategic analysis to support the planning phase of the PPBE system.
- The need to accelerate modernization.
- The PPBE system can be insular and operate off its own baselines disconnected from conditions on the ground. Identifying ways to make greater use of realized financial and performance data would be another major contribution of the commission.

The report offers three key PPBE reforms to address these and related challenges: 1) Rebuild strategic analysis capability, 2) improve agility in allocating resources, and 3) make greater use of performance data to inform resource decision-making.



DANIEL J. CHENOK



MIKE LIBUTTI



This report can support the commission’s work by providing an overview of the PPBE system, challenges that have hindered previous reform efforts, and key recommended reforms.

In an increasingly dangerous world with near-peer competitors investing rapidly and posing new and evolving risks, improving DoD resource allocation stands as a national security imperative. We hope that this report offers timely insights and guidance that can assist the PPBE Commission and other efforts to improve the PPBE process in achieving DOD’s critical national security mission.

Daniel J. Chenok  
Executive Director  
IBM Center for The Business of Government  
[chenokd@us.ibm.com](mailto:chenokd@us.ibm.com)

Mike Libutti  
Senior Partner & Vice President  
U.S. Defense & Intel Industry Leader  
IBM Consulting  
[m.libutti@us.ibm.com](mailto:m.libutti@us.ibm.com)

# EXECUTIVE SUMMARY

**The Department of Defense (DoD) resource allocation process—the Planning, Programming, Budgeting, and Execution (PPBE) system—is now sixty years old. It has brought discipline and rigor to one of the toughest budget environments in the government.**

It has also been criticized for being slow and bureaucratic, hindering DoD's efforts to accelerate modernization in the face of fast paced high technology advancement and increasing aggressive near peer adversaries. The 2022 National Defense Authorization Act directed establishment of a PPBE reform commission. This report provides an overview and history of the PPBE system, recommends three key challenges that the commission should address, and identifies obstacles that the commission should avoid.

The first key challenge is the lack of strategic analysis to support the planning phase of the PPBE system. In 2018, DoD issued a major change to its strategy. After two decades of counter-terrorism and counter-insurgency warfare, DoD is pivoting to counter the increasing aggressiveness of near peer adversaries China and Russia. This will drive major changes to DoD posture, capability, and force requirements. But after four years, progress has been slow and DoD still does not have analytically informed answers to many of these key requirements questions. DoD had a process previously for conducting this analysis and developing planning decisions, but it was significantly curtailed a decade ago. Developing options to rebuild strategic analysis would be major contribution of the commission.

The second key challenge is to accelerate modernization. Shifting focus from the Middle East to the Pacific replaces a “permissive” operating environment with a “denied” operating environment. While horrific and costly to American lives and interests, the terrorist threat did not have the resources and capabilities of a large, technologically advanced state actor. From countering air defenses to long-range precision weapons, the U.S. needs to rapidly field new technology to maintain overmatch against near-peer rivals. PPBE reform options that enable more rapid modernization would be another major contribution of the commission.

Finally, the PPBE system can be insular and operate off its own baselines in a disconnected way from reality on the ground. This underutilization of realized performance data is not surprising in an agency focused on a contingency mission (fortunately major wars are infrequent and we don't have large data bases of our performance fighting near peer adversaries). But a wealth of data does exist and the failure to use them in planning, programming, and budgeting decision making leads to reduced readiness, inefficiency, and loss of buying power. Identifying ways to make greater use of realized financial and performance data would be another major contribution of the commission.

The three most important reforms needed today are rebuilding strategic analysis, improving the speed and agility for allocating resources, and expanding the use of performance data in decision making.

**Rebuild Strategic Analysis.** Within the PPBE process, the responsibility for translating strategic guidance into posture, force structure, and capability requirements is in the first “P”—the planning phase. Planning provides the (analytic) connective tissue between enduring (multiyear) documents. To be successful, the planning phase is both an analytic capability and a decision-making process. As an analytic capability, it establishes baselines for threats, alternative futures, and scenarios. When a new strategy is issued, the planning phase would provide the analytic structure and reference points that subsequent analyses could use to identify key gaps in military capability, requirements for force structure, and operational needs in areas like posture, basing and overflight access, and allied and partner engagement.

**Improve Agility in Allocating Resources.** The PPBE system is not considered fast or agile enough, in its current form, to support DoD capability development at the current pace of technological advancement set by American industry. Moving to a faster, more agile, and more competitive budgeting process is a needed complement to acquisition reform if the United States wants to maintain and grow its advantage against China. 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. On the congressional side, appropriations will have to become more flexible. 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.

**Use Realized Performance Data.** A third key area where progress could be made is in increasing the use of program evaluation and performance data in the PPBE process. Too often the PPBE system operates in an insular way, working off its own baselines with, at best, an ad hoc and incomplete incorporation of financial execution results, experienced performance levels, and congressional marks. DoD’s challenge is harder than many other federal agencies because it executes its mission on a contingency basis, rather than a steady-state basis. 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 more statisticians and econometricians. There have been successful efforts in DoD to make greater use of realized data, for example, there is an Army execution review initiative that performs this function on financial execution data. With annual full-scope financial statement audits well underway, the pieces are now in place for major improvement.

# INTRODUCTION

**With a budget of over \$700 billion per year, the Department of Defense (DoD) is the largest discretionary spending account in the federal government by a wide margin.**

If DoD's budget were a country's Gross Domestic Product, it would be around the twentieth largest country in the world—around the size of Switzerland and Poland.<sup>1</sup> If its budget were a company's revenue, DoD would be the largest company in the world by far—well over the \$525 billion or so in revenue that Wal-Mart earned in 2021.<sup>2</sup>

Attempting to allocate and coordinate these resources to conduct operations, maintain readiness, and invest in modernization is an enormous undertaking. It is so challenging that some have suggested, only half-jokingly, that it is more useful to think of DoD as an economy, with its own internal markets and incentive structures, rather than a single enterprise with centralized decision making. But directing the allocation of resources is a primary way the Secretary of Defense establishes and exercises their control over DoD and is an essential element of producing a strategy driven budget.

The process that supports the Secretary in the allocation and management of resources is the DoD Planning, Programming, Budgeting, and Execution (PPBE) system. Established in 1961, it was a key component of Secretary McNamara's plan to advance the then fourteen-year-old, and largely failing up to that point, attempt to create a unified DoD. Considered a revolution in management at the time, the now sixty-year-old system has proven itself to be a powerful, enduring tool for unifying resource allocation decisions, cementing the Secretary's control over the Department, and focusing DoD on the future.<sup>3</sup>

The PPBE system is also a frequent target of criticism, accused of being too bureaucratic, slow, cumbersome, and expensive. These concerns, particularly as they impact the speed and agility with which DoD can modernize, have been growing in recent years. Near-peer competitors like China and Russia are rapidly eroding America's competitive advantage. They were not sitting still while the United States fought terrorists in Iraq and Afghanistan. They were studying American vulnerabilities and taking advantage of rapidly developing technology—frequently through espionage and intellectual property theft—to gain military advantage.

This erosion of U.S. overmatch has inspired increasingly aggressive conduct. Within the last few years, we have seen Russia invade Crimea and then the rest of Ukraine while China's crackdown in Hong Kong has been followed with increased belligerence to Taiwan and its neighbors in the South China Sea. The U.S. is in a race against time to reestablish credible deterrence and contain further aggression before it turns into military conflicts. Timely adoption of new technology and fielding advanced equipment have become national security imperatives.

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1. [World GDP Ranking 2021—StatisticsTimes.com](https://www.statista.com/statistics/1101167/world-gdp-ranking-2021/).

2. 2021 Fortune 500 list, [Fortune Global 500 2021](https://www.fortune.com/rankings/global-500/), [Full list of rankings](https://www.fortune.com/rankings/), *Fortune*.

3. One common humorous statement is that it is one of history's great ironies that a major factor in defeating Soviet communism was one of the largest centrally planned economies in the world—the U.S. Department of Defense.



To accelerate the speed and agility of modernization, Congress first directed a fundamental restructuring of the defense acquisition system. Key changes included streamlining processes, shifting authorities to lower levels of the Department, and improving industry access with more flexible contracting options. So far, these reforms, combined with their skilled execution from defense leaders like former Deputy Secretary David Norquist and former acquisition Under Secretary Ellen Lord, seem to be working, and are providing momentum to modernization. They also provide an example of how to affect positive change in a complex public bureaucracy like DoD.

Congress has now turned its sites to the PPBE system. Section 1004 of the Fiscal Year (FY) 2022 National Defense Authorization Act (NDAA) directs a commission on PPBE reform. The commission is tasked with conducting a comprehensive assessment of the efficacy and efficiency of all phases and aspects of the [PPBE] process, which shall include an assessment of:

- A. The roles of Department officials and the timelines to complete each such phase or aspect
- B. The structure of the DoD budget, including the effectiveness of categorizing the budget by program, appropriations account, major force program, budget activity, and line item, and whether this structure supports modern warfighting requirements for speed, agility, iterative development, testing, and fielding
- C. A review of how the process supports joint efforts, capability and platform lifecycles, and transitioning technologies to production
- D. The timelines, mechanisms, and systems for presenting and justifying the budget of DoD, monitoring program execution and DoD budget execution, and developing requirements and performance metrics
- E. A review of the financial management systems of DoD, including policies, procedures, past and planned investments, and recommendations related to replacing, modifying, and improving such systems to ensure that such systems and related processes of the Department result in: 1) effective internal controls, 2) the ability to achieve auditable financial statements, and 3) the ability to meet other financial management and operational needs
- F. A review of budgeting methodologies and strategies of near-peer competitors to understand if and how such competitors can address current and future threats more or less successfully than the United States.<sup>4</sup>

This report is intended to support the commission's work by providing an overview of the PPBE system, provide recommendations for key PPBE challenges and reforms that the commission should focus on, and identify pitfalls and distractions that have hindered previous reform efforts. It draws and expands upon earlier work coauthored with Greg Pejic and published in *War on the Rocks*.<sup>5</sup>

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4. H.R. 4350—117th Congress: National Defense Authorization Act for Fiscal Year 2022. [www.GovTrack.us](http://www.GovTrack.us).

5. John Whitley and Greg Pejic, "Senate Commission to Fix Defense Budgeting is Right on the Mark," *War on the Rocks*, September 24, 2021. [Senate Commission to Fix Defense Budgeting Is Right on the Mark—War on the Rocks](#).

# PPBE Overview



The PPBE system, or some variant of it, is the governing process for resource allocation in most of the security agencies of the federal government, including DoD, the Department of Homeland Security (DHS), the Intelligence Community, the Department of Energy's National Nuclear Security Administration, and the National Aeronautics and Space Administration—in short, most agencies involved with national security and that include large capital expenditures as a major part of their operations. This section provides an overview of the DoD PPBE system, including its history, governing principles, structure, and supporting infrastructure within DoD.

## PPBE History

The PPBE system originated as the Planning, Programming, and Budgeting System (PPBS) in DoD in 1961. At that time, top-level policy direction for DoD was provided largely by the National Security Council (NSC) staff and the Joint Staff, while budgeting was done by the DoD Comptroller and the Bureau of the Budget (BoB), now part of the Office of Management and Budget. There was no direct process link from policy to budgets, and the two were largely disconnected—a challenge that remains across government agencies today. Defense Components (e.g., military services) built their own annual budgets, and these budgets generally exceeded the fiscal guidance the Components had been given. Budgets were cut back to fiscal guidance levels by the DoD Comptroller and the BoB in the fall budget process, frequently driven more by short-term pressures than definitive statements of U.S. defense policy.<sup>6</sup>

Introducing PPBS was not intended to fundamentally alter policy formulation or budgeting processes. Rather, the intent was to ensure that top-level goals and objectives were in fact reflected appropriately in the budgets submitted to the Congress—i.e., make the two processes talk to each other. The PPBS did this by introducing two new elements. The first was an analysis and decision process placed between policy formulation and budgeting. This new process encompassed both of the Ps in PPBS—Planning and Programming. It was intended to provide the Secretary of Defense with a means for making strategic and cost-effective decisions on force structure and major acquisition programs and the funding and manpower that these entailed. The second new element was a detailed multiyear force and financial plan—the Future Years Defense Program (FYDP). The combination of the two elements was to focus decision making on analytically based trade-offs about future end states.<sup>7</sup>

There have been many adjustments to the overall process over the years. In the 1960s, the first estimate of the resource plan was developed by the Systems Analysis office in the Office of the Secretary of Defense (OSD). In the 1970s, this shifted to the DoD Components developing the first draft of the plan. In the early 2000s, Execution was formally added to the title as part of an effort more closely link the strategy and formulation functions that occur prior to an appropriation to budget execution. There have been periods where some of the phases discussed in the process section below have occurred sequentially and others where they were conducted concurrently. There have been years when the full sequence of steps was only conducted every other year, while the “off years” were limited to adjustments to the baseline developed in the full cycle. But, while these details of execution have evolved, the overall PPBE framework has endured for sixty years and remains the central organizing concept of defense resource management.

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6. Department of Homeland Security, *Planning, Programming, Budgeting, and Execution System Operating Handbook*, June 2012.

7. Alain Enthoven and Wayne Smith, *How Much is Enough: Shaping the Defense Program 1961-1969, 1971*, republished by the RAND Corporation, 2005.

There has been much discussion over the years about why the PPBE system, a reform of enormous magnitude and scope, survived its initial introduction when so many other management reforms fail to take hold. This question is relevant to the PPBE Commission and worth briefly reviewing here. Two key factors that have been identified are the long tenure of Secretary McNamara and the immediate use of PPBS to solve major defense issues. Unique among Defense Secretaries, McNamara served almost eight full years in office (the two four-year presidential terms spanned by Presidents Kennedy and Johnson). This allowed him to continue leading this reform longer than most other leaders remained in office during that period, including Defense Component leaders who were not supportive of PPBS and, in other situations, might have waited out the reform proponent.

The second factor is that PPBS was used as a tool by the leadership from day one. An early priority of Secretary McNamara's was reassessing nuclear deterrence and reforming nuclear posture. PPBS was used to organize this assessment and drive decisions. The FYDP was built for these forces and used to implement these decisions, other areas of DoD were more fully developed in the FYDP over time. This active use prevented PPBS from being an "academic" reform that could be ignored by Defense Components. Indeed, after initial opposition, Service leadership realized that they would have to work within PPBS or be excluded from decision making. This drove investments at the Service level in analytic capability and development of their own PPBS processes—i.e., initial resistance and "wait it out" attitudes shifted to "I am going to have to beat them at their own game" views. The analytic culture of discussion and decision making that is now deeply ingrained within DoD is a direct result of this change.

## PPBE Principles

While many define the PPBE system as a set of process steps used to build a budget, its founders defined it as a set of principles that should undergird resource allocation decisions. They were less concerned about any specific process arrangements and were focused on bringing discipline and analytic rigor to the production of strategy informed budgets. The six key principles<sup>8</sup> identified by the founders of PPBS that drove their development of the system are:

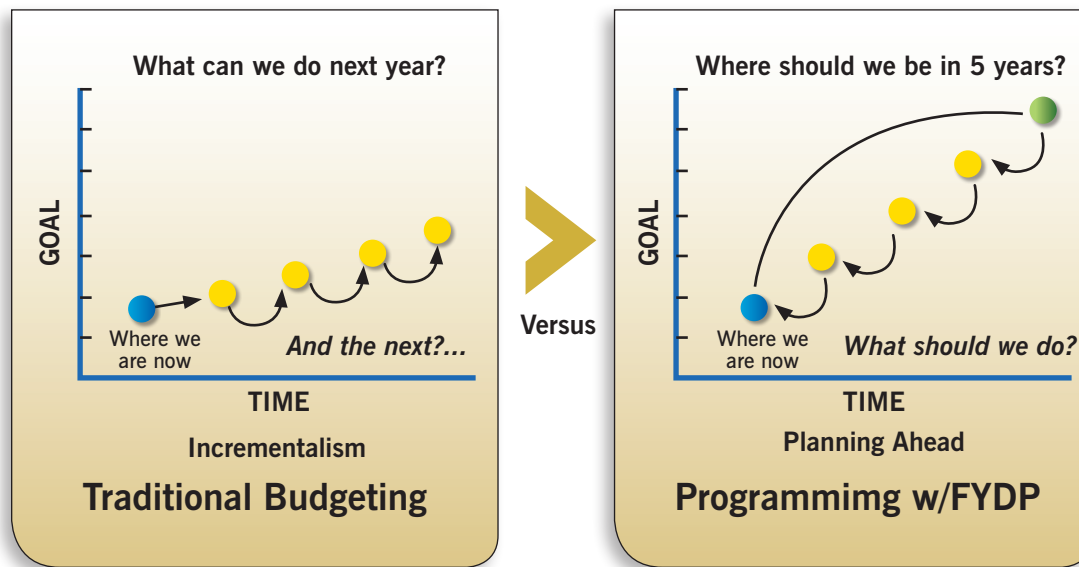
- Resource decisions should be based on explicit criteria of national interest.
- Resource decisions should be based on choices among explicit, balanced, and feasible alternatives.
- Needs and costs should be considered simultaneously.
- Open and explicit analysis, available to all parties, should form the basis for resource decisions.
- An independent analytic staff should support the Secretary of Defense.
- A multiyear force and financial plan should project the consequences of present resource decisions into the future.

As stated above, a primary goal was to create strategy informed budgets from what had been largely separate strategy and budgeting processes. The introduction of planning and programming was meant to identify clear choices over competing forward-looking end states, analyze the pros and cons of these end states (including affordability), make a selection between the choices based on national interest, and then use the FYDP (the multiyear force and financial plan) to provide a resource plan to achieve the selected end state. Figure 1 illustrates the idea of programming resources to achieve future end states compared to the single year budgeting process in place prior to the PPBE system.

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8. Alain Enthoven and Wayne Smith, *How Much is Enough: Shaping the Defense Program 1961-1969, 1971*, republished by the RAND Corporation, 2005.

Figure 1. Traditional Budgeting vs. Programming



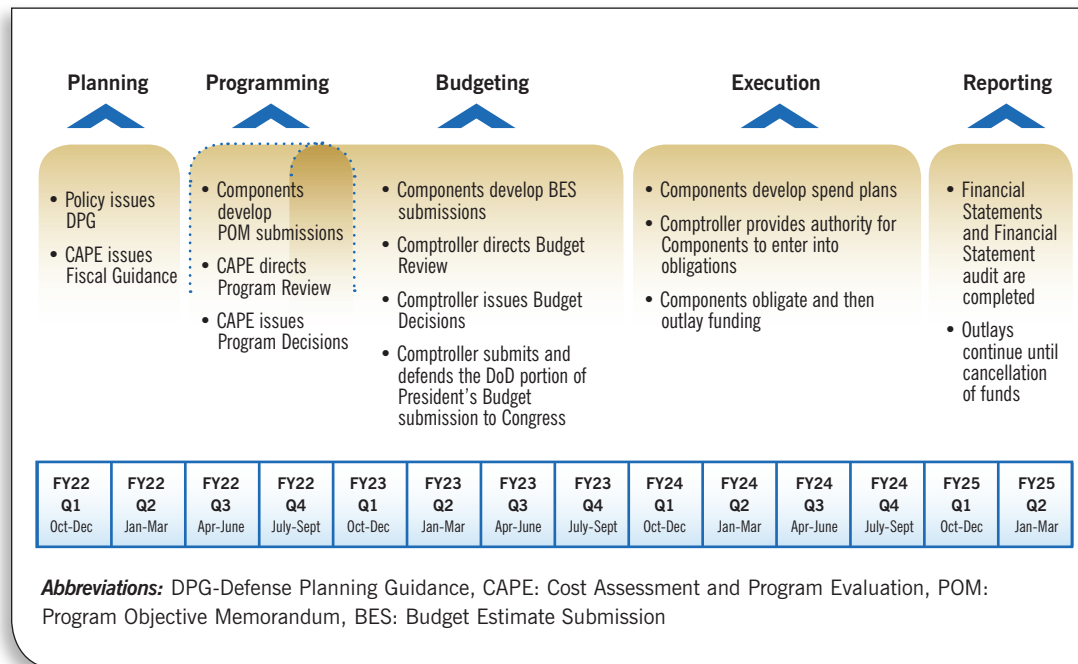
## PPBE Process

The basic phases or process steps of the PPBE system are straightforward. Prior to the start of a PPBE cycle is the development of strategy. Multiyear documents like the National Security Strategy and the National Defense Strategy document the goals and objectives of DoD. These strategy documents might be supplemented with functional and organizational strategies, posture reviews, and other supporting documents. The PPBE phases then include:

- **Planning:** Translation of broad, enduring strategy to annualized Defense Planning Guidance (DPG) for capabilities, force structure, and posture for the upcoming FYDP and budget build. Fiscal Guidance is also issued that provides Component funding levels by year for the FYDP being developed. The Deputy Secretary is traditionally the responsible office for the DPG and Fiscal Guidance, supported by the Under Secretary of the Defense for Policy for developing the DPG and the Director of Cost Assessment and Program Evaluation (CAPE) for developing Fiscal Guidance.
- **Programming:** Allocation of a five-year profile of resources to programs in accordance with the DPG and constrained by Fiscal Guidance. DoD Components prepare the first draft, called the Program Objective Memorandum (POM) and it is then reviewed by the Deputy Secretary in the CAPE-led Program Review. The final product is the FYDP.
- **Budgeting:** Development, submission to Congress, and defense of a detailed budget for the first year of the FYDP. DoD Components prepare the first draft, called the Budget Estimate Submission (BES), and it is then reviewed by the Deputy Secretary in the Comptroller-led Budget Review. The final product is the DoD portion of the President's Budget submission followed by an appropriation by Congress.
- **Execution:** The obligation and, ultimately, outlay of the appropriated resources. Overseen by Comptroller and executed in a decentralized fashion by all DoD Components.

Figure 2 illustrates these phases.

Figure 2. Typical PPBE Cycle



The practical merits of this phased approach are driven by the principles identified above and the enormity of the challenge of allocating resources in a \$700 billion budget. It would be impossible for a Secretary and Deputy Secretary of Defense to direct the allocation of every dollar in the budget, and to do so in the typical late-summer/early-fall budget build process used in much of the federal government. By dividing decisions into strategy, planning, programming, and budgeting levels, a general direction can be assigned followed by analysis and discussion to refine this direction into more specific programmatic options and, finally, honed into specific budgetary proposals. This allows for analytic support to decision making, divides the decisions into manageable and incremental steps for senior leaders, and provides for the delegation of many of the more detailed decisions that have to be made.

This phased approach to decision making also enhances the political feasibility of making decisions. By providing strategic direction, having debate over that strategic direction, then moving to programmatic options, having debate over those programmatic options, and finally moving to budget options and debating these, decisions are made incrementally and the sprawling defense enterprise can be moved along gradually on contentious resource allocation issues. In addition, the leaders can continually “take the pulse” of the organization to evaluate the degree of support and opposition that exists for various decisions. Resource allocation decisions are zero-sum and create winners and losers. Making those decisions in the federal government is very difficult and frequently fails or is avoided as much as possible. The PPBE system is a structured process to enable Secretary and Deputy Secretary of Defense decision making.

Finally, it is important to note that the political cycle also plays a significant role in shaping the PPBE process. A new administration assumes office on January 20. At that snapshot in time, when the Secretary of Defense and, perhaps, the Deputy Secretary are assuming office and there are almost no other senior political leaders in place, the following budget cycles are underway (using January 2025 as an example):

- DoD is four months into executing FY25.
- There are two weeks to the scheduled submission of the budget proposal for FY26.
- DoD Components are part way through development of the FY27 POM and OSD will begin its review in about six months.
- It has a full cycle to develop the FY28 budget, the last budget it will fully execute (unless the leadership stay in office for a second term).

Also at that point in time, the new administration will not have any of its strategic documents, e.g., NDS, developed or issued. This reality has a major impact on the execution of the PPBE process. The new Secretary must triage a range of issues, including:

- What high priority issues can be jump started with a reprogramming action in FY25? This must be done in time for a summer omnibus reprogramming.
- What high priority issues can be developed in time for submission with the FY26 budget? This must be done in time for the PB submission that will probably be delayed from the first Monday in February to the spring.
- What high priority issues cannot be developed in time for the FY26 budget but, with quick guidance to the DoD Components, can be developed in the FY27 POM for review by the Secretary in the fall?
- What priority issues should be focused on in the full cycle FY28 build?

PPBE reforms much take these realities into account. Reform options to further enable a new leadership team “getting its feet under them” would be valuable.

## PPBE Operations

Executing the PPBE system draws on people and organizations from across DoD and relies on an extensive infrastructure of data, systems, and processes. Two key areas necessary for understanding the operations of the PPBE system in DoD are the various account structures used in the PPBE phases and the organizations that support PPBE execution.

### Account Structure

The organizing structure of resources, i.e., account structure, is an important element of a resource allocation system. As GAO has stated, “[t]he method of budget reporting represents much more than a technical discussion about how to measure costs; rather it reflects fundamental choices about the types of controls and incentives that are important in the decision-making process.”<sup>9</sup> It will likely be a major area of discussion for the commission, particularly in the context of flexibility to realign funding in response to rapidly changing technology, and is thus valuable to review.

The DoD budget is appropriated in an account structure organized around categories of resources that are inputs to the production of defense programs, capabilities, and missions. There are a few smaller accounts, but the major accounts are:

- **Military personnel (MILPERS):** Includes costs for military personnel such as base pay, special and incentive pays, some benefits like accrual payments for retirement, and change of station costs.

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9. Government Accountability Office (GAO). 2000. Accrual Budgeting: Experiences of Other Nations and Implications for the United States. Report to the Honorable Benjamin L. Cardin, House of Representatives. GAO/AIMD-00-57.

- Operations and maintenance (O&M): Includes civilian pay, the cost of most military and civilian personnel benefits that DoD budgets for, operating expenses for weapons systems, etc.
- Research, development, test, and evaluation (RDT&E): Includes R&D expenditures, some test and evaluation enterprise costs, and some directly related costs like labor.
- Procurement (PROC): Includes the purchase of major weapon systems.
- Military construction (MILCON): Includes the designing and building of infrastructure like buildings, runways, and ranges.

This structure began to formally coalesce in the decade leading up to the 1961 introduction of PPBE (then PPBS). Grouping like inputs into budget accounts is a very useful structure for controlling funds and executing the budget. It is also useful for making some strategic level assessments of budgetary choices. For example, the more operationally focused accounts of MILPERS and O&M are frequently combined to create overall operating and sustainment (O&S) costs while the more forward-looking investment focused accounts of RDT&E, PROC, and MILCON are combined to create overall modernization costs. This allows the Secretary to assess the balance that has been struck between today (O&S) and tomorrow (modernization) in a budget.

**Figure 3. Defense Budget 1980-2021**

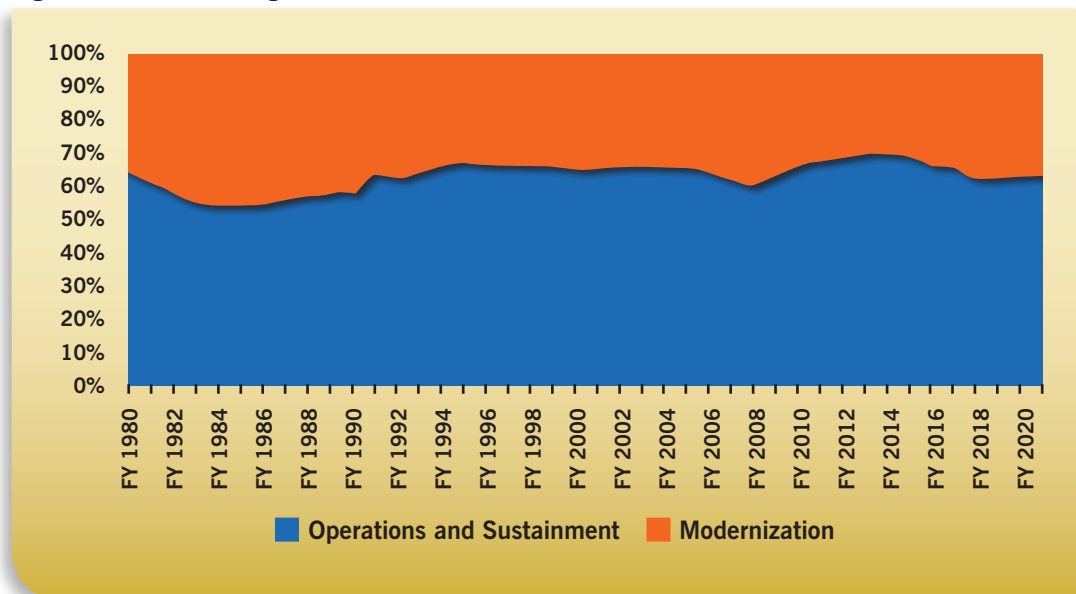


Figure 3 above provides the fraction of the DoD budget provided to O&S versus modernization. From 1980 to 2021, O&S ranged from a low of 54 percent of the DoD budget to a high of 70 percent. The low period for O&S was in the 1980s during the Reagan buildup when almost half of the budget was allocated to modernization. O&S was high during the 2000s when a larger share of the budget was allocated to the Global War on Terrorism, but the peak came in 2013-2015 during the sequester period when the DoD budget was cut substantially and modernization was significantly slowed. One key trend that can be seen when a longer time series is examined is that O&S has been gradually increasing over time. In the inter-war period 1954 to 1964, O&S averaged 54 percent of the DoD budget. From 2012 (following the ending of Operation Iraqi Freedom) to 2021, O&S averaged 66 percent of the budget. The growing costs for personnel and weapons system O&S are significant defense resource management issues. This would be an important issue for the commission to examine.



But this input cost structure also has significant limitations. For example, it is not helpful for trying to understand the costs of various DoD activities such as our Pacific presence or the Apache helicopter program, which contain expenditures from every budget category. It is not helpful for resource allocation decision support such as comparing the relative costs of obtaining intelligence and surveillance capability from a helicopter squadron, an unmanned aerial system squadron, a DoD owned and operated satellite system, or purchased as-a-service satellite imagery.

To account for these challenges, the PPBE system also uses an output-oriented resource structure called program elements (PEs). As their name suggests, PEs categorize resources according to programs and activities—output-oriented collections of resources that cut across the input-based appropriations structure. PEs divided into appropriation resource categories form the building block data structure for the FYDP. They can be aggregated by resource category to provide an appropriation view of resources and aggregated by PE to examine major program areas and organizations.

More broadly still, the most valuable view of resources to support decision making depends on the decision being made. Some of the common views by PPBE phase include:

- Strategic decisions: mission costs. To make broad decisions about defense and national security priorities, it is often most useful to understand how much is spent on specific mission categories and what the costs of different mission priorities would entail.
- Planning decisions: capability costs. The planning phase identifies and prioritizes the capabilities required to deliver on missions, making the costs of capabilities an important view of resources.
- Programming decisions: program costs. The PE view of resources is the primary data source for the programming phase.
- Budgeting decisions: resource costs. The appropriation structure is the primary data source for the budgeting phase.

As GAO stated, account structure has important implications for controls and incentives. Legally, all DoD resources are controlled according to the structure they are appropriated in by Congress. This includes the broad resource categories identified above, but it also includes for many accounts (primarily RDT&E and Procurement) the PE structure as well because Congress uses the programmatic structure to allocate funding within those resource categories. While DoD can move funding between those accounts in an unlimited manner during planning, programming, and budgeting, once an appropriation bill is enacted the only way to move significant funds between accounts is through reprogramming actions that must be approved by Congress. Since RDT&E and Procurement are appropriated in relatively granular PE-level accounts, this significantly reduces flexibility in execution. As discussed below, one of the major motivations for the PPBE commission is concern with the agility and flexibility of the defense budget to support modernization in a world with rapidly changing technological progress. Account structure will likely be an important area of discussion within the commission.

The second area highlighted by GAO is incentives. A vivid illustration of the challenges that bad account structures can cause through misaligned incentives is provided by the Defense Health Program in the call out box that follows.

## Defense Health Program

The Defense Health Program (DHP) account provides an example of the impact of poorly aligned incentives. DoD has two primary medical missions: delivering casualty care in wartime and providing a high-quality healthcare benefit to service members, retirees, and their families. The first is a military mission provided by uniformed healthcare providers and, during peacetime, is a readiness priority—i.e., maintaining clinical currency of the military medical force. The benefit mission is commercial activity and an element of compensation like pay, retired pay, and commissary benefits.

To achieve the best incentives, these missions should be placed in their respective trade spaces. The readiness mission (combat casualty care) should be funded and managed with other readiness functions so that senior leaders can evaluate readiness tradeoffs—e.g., will investing more in medical readiness, logistics, or weapons provide a bigger return on achieving military objectives at minimal loss of life? The benefit mission should be funded and managed with other compensation functions so that senior leaders can evaluate compensation tradeoffs—e.g., will DoD be more likely to achieve recruitment and retention goals by adding to health benefits or increasing base salaries.

This is not how DoD has traditionally been structured. The readiness and benefit healthcare missions have been combined into a single program. The DHP is both a management structure and appropriation account. It puts a key lifesaving readiness function into a direct trade space with a key compensation function. During peacetime, the benefit function, which is primarily pregnancy and childbirth, pediatric, and family practice care, dominates attention and historically wins the trade space. When war starts, DoD finds itself without the trauma surgeons, emergency medicine physicians, and critical care specialists required to save lives on the battlefield. This “peacetime effect” has been estimated to account for over 100,000 combat deaths from World War II to present (Cannon et al., 2020).

This challenge is beginning to be recognized. The Fiscal Year 2017 National Defense Authorization Act directed a major restructuring of the DHP to align readiness functions with Services and benefit functions with the Defense Health Agency. In developing the Fiscal Year 2021 budget, Secretary of Defense Esper moved about two billion dollars per year of readiness funding out of the DHP account, realigning it to Service readiness accounts. Although more needs to be done, progress is beginning to be made.

## PPBE Leadership Organizations

In 1961, to execute the new analytic process and maintain stewardship of the new database, a new Office of Systems Analysis was created. The name was later changed to Program Analysis and Evaluation (PA&E), the name still used in other PPBE agencies like DHS, and most recently has changed to Cost Assessment and Program Evaluation (CAPE). CAPE is perhaps the office most associated with the PPBE system, but there are several key offices that execute PPBE phases. At the headquarters-level for DoD, key offices include:

- Strategy: OSD Office of the Under Secretary of the Defense (Policy)
- Planning: Three primary offices contribute: OSD Policy, OSD CAPE, and the Joint Staff. Within the Joint Staff, responsibility is divided between two key offices, the Joint Force Development Directorate (J-7) and the Force Structure, Resource, and Assessment Directorate (J-8).
- Programming: OSD CAPE
- Budgeting: OSD Office of the Under Secretary of Defense (Comptroller)
- Execution: Although execution is decentralized in DoD, Secretarial oversight is exercised through Comptroller.

Most of the Military Departments have corresponding offices for their internal PPBE processes. Strategy and planning are generally the purview of the “3” shop (Army G-3, Navy N-3, and Air Force A-3). The Services usually lead programming from their “8” shop (G-8, N-8, and A-8) and all of the Military Departments have a Senate confirmed appointee that serves as Assistant Secretary for Financial Management and Comptroller.

One key challenge with the current PPBE system discussed below is with the planning phase. The “tri-led” (Policy, CAPE, and Joint Staff) process has had an uneven record of producing results and, currently, is not functioning well. This will likely be a key area of focus for the commission.

# Three Key Reforms



There have been many criticisms of the PPBE system over its sixty-year history. In the author's experience over a career working in resource allocation with DoD and other national security agencies, including most recently leading CAPE and the DoD PPBE system, three of the most important reforms needed today are rebuilding strategic analysis, improving the speed and agility for allocating resources, and expanding the use of performance data in decision making.

## Rebuild Strategic Analysis

In 2018, DoD issued a widely anticipated National Defense Strategy (NDS) that set a new direction for military strategy. After two decades of counter-terrorism and counter-insurgency warfare, the NDS announced a realignment to near peer competitors China and Russia. This realignment implies significant changes, e.g., increasing focus on the Pacific and Europe while reducing focus on the Middle East and investing in weapons to fight against technologically advanced countries in a denied environment versus less advanced terrorists in a permissive environment. But DoD is now four years since the NDS release and still does not have a well-formulated view of its implications for force mix, capability needs, and posture requirements. As Russia's recent invasion of Ukraine vividly illustrates, the U.S. cannot afford continued delays to key investments to deter the aggression of near peer adversaries.

Within the PPBE process, the responsibility for translating strategic guidance into posture, force structure, and capability requirements is in the first "P"—the planning phase. Planning provides the (analytic) connective tissue between enduring (multiyear) documents like the NDS and the annual allocation of resources to specific programs. Planning efforts have been called or have included the analytic agenda, force development and design, strategic integration, and various other titles. Put simply, the U.S. can't execute the NDS if it hasn't assessed what the strategy means for resource allocation priorities. The call out box below illustrates this challenge with respect to China in the Pacific.

### What Does the NDS Mean for the Pacific?

The NDS provided clear strategic direction that the U.S. would prioritize near peer challenges like China and Russia after two decades of focus on the asymmetric threats posed by terrorism. This provides many clear implications: the Pacific and Europe will become more important after intense focus on the Middle East, weapons and systems that were effective in a permissive environment against a terrorist threat without sophisticated air defenses will be less useful against sophisticated high-technology adversaries, and large scale combat operations must be relearned by a generation of warfighters who have been engaged in counter-terrorism and counter-insurgency for most of their careers.

But the NDS left many open questions about how to balance competing priorities. The Pacific is large and has many potential challenges, including the Korean peninsula, Taiwan, the South China Sea, and the India-China border (where the most recent shooting war took place in the region). Russia is expected to be a declining power while China represents the bigger long-term threat, but Russia's invasion of Ukraine and large nuclear arsenal remind us that even declining threats can't be ignored. Presence is the strongest deterrent but is expensive and cannot be provided everywhere. The list goes on and on.

### What Does the NDS Mean for the Pacific?

One of the biggest challenges militarily would be stopping a Chinese amphibious invasion of Taiwan, preferably before landing. Some have argued that since it is one of the most important and difficult tasks implied by the NDS and resources are scarce, DoD should specialize force investments for this, e.g., prioritize military forces for a standoff missile exchange while cutting general purpose forces that can fight against a more robust range of threats.

Others point out the risk in specializing forces for one location and type of fight. They point out that ignoring the messy follow-on phases of combat that come after the “shock and awe” missile exchange has created problems in the past. Post-invasion Iraq is a recent example, but a Pacific example is the bloody Korean war when planners had assumed new technology (atomic weapons) reduced the need to prepare for the entire range of wartime challenges.

These are all valid questions and points of view. The only way to resolve them is for strategic-level analysis to be done, rigorously identifying the costs and benefits of different courses of action for senior decision makers. Rebuilding this analytic capability is a national security priority.

To be successful, the planning phase is both an analytic capability and a decision-making process. As an analytic capability, it establishes baselines for threats, alternative futures, and scenarios. When a new strategy is issued, the planning phase would provide the analytic structure and reference points that subsequent analyses could use to identify key gaps in military capability, requirements for force structure, and operational needs in areas like posture, basing and overflight access, and allied and partner engagement. This suite of analyses would bridge the strategy to the programming phase of PPBE, providing clear direction for how to allocate resources to forces, research and development, and operational activities to ensure that the department was on track for a future conflict. Its time frames would range from five to ten years into the future for some areas and to twenty-plus years into the future for very long lead areas like ship building.

As a decision-making process, it would identify key directional decisions that have to be made to implement the strategy. These might include key planning factors and baselines like prioritization of threats, how big and how many fights to plan for, how specialized versus generalized forces should be, and force laydowns in key regions. These key decisions would be developed over time, using the analytic capabilities identified above, and ultimately issued by the Secretary or Deputy Secretary as planning guidance for the upcoming programming and budgeting cycle. When this doesn't happen or, in the most common case, it happens as a formality without developing substantive analytically informed decisions the programming and budgeting phases are forced to make more detailed resource allocation decisions without clear directional guidance derived from strategy.

There are many reasons for the current failures. For valid reasons at the time, the Defense Department eliminated its previous version of the analytic processes that supported the planning process a decade ago. For no valid reason, it has failed to replace it. Organizationally, there are three key offices that lead this function: the Office of the Under Secretary of Defense for Policy (Policy), the Office of Cost Assessment and Program Evaluation, and the Joint Staff. When the previous process was eliminated, Policy and Office of Cost Assessment and Program

Evaluation divested many of their capabilities in support of headquarters personnel reductions. The Joint Staff moved the function from Force Structure, Resource, and Assessment (J8) to Joint Force Development (J7). The result is that the relevant offices don't have adequate capacity or experience to execute these key functions and, equally importantly, no one is in charge. The tri-led function has worked occasionally in the past when led by the right mix of personalities, but it is not working now.

Another key factor is the strategic environment. For the first half of DoD's existence, the Cold War was the dominant strategic environment. Since the Cold War, DoD has struggled to define clear strategic plans and guidance. During the 1990s, the focus was on how to fight two nearly simultaneous regional wars. In 2001, the U.S. entered the Global War on Terrorism and counter-terrorism was the dominating issue for the following two decades (during which time the planning process was eliminated). The 2018 NDS directed a dramatic shift in strategic thinking. Without an analytic process for planning, this change in direction has overwhelmed DoD decision making processes.

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.

## Improve Agility in Allocating Resources

A second, and highly discussed, challenge is that the deliberative, analytic, disciplined framework of the PPBE system is not fast or agile enough, in its current form, to support DoD capability development at the current pace of technological advancement set by American industry. As discussed in the introduction, while the U.S. was focused on counter-terrorism over the last two decades near-peer competitors China and Russia were watching, learning, and investing. Accelerating defense modernization to maintain our overmatch is now a national security imperative.

This is made harder by management processes that can't meet the needs or match the pace of rapid technology development. China's industrial base can't compete with the entrepreneurial spirit of America's commercial sector, but slow Defense Department decision processes hamper U.S. ability to leverage this fundamental strength. Moving to a faster, more agile, and more competitive budgeting process is a needed complement to acquisition reform if the United States wants to maintain and grow its advantage against China.

The challenges here primarily reside in research and development resourcing but has examples across the defense budget. It is primarily an execution challenge but is experienced in programming and budgeting as well. As new technologies emerge and evolve, and new private-sector companies rise and fall around these technologies, DoD decision makers need to be able to adjust spending at a compatible pace. The current system makes that very difficult.

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 call out boxes below describe each of these in more detail.

### **As-a-Service Acquisition Model**

For many technologies, 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.

The technology landscape has changed considerably in the last few decades. 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.

DoD’s traditional business process of design, build, own, and operate high technology platforms means that it bears the full cost of technology development and the cost of updating and refreshing it. In today’s technological environment that is not just inefficient, it also means that DoD blocks itself out of the fast pace of civilian technology advancement by locking into quickly outdated systems. 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.

DoD is using the as-a-service model in many areas now. Examples include satellite communications (Hitchens, 2022)) and satellite imagery (Collins, 2021). DoD even has a contract for tanker aircraft as-a-service (Meta, 2021). As-a-service purchasing can be done in many areas from direct warfighting capabilities to “back office” support functions like business systems.

There are, of course, limitations to the as-a-service model, e.g., it may not be appropriate for key military essential capabilities that must be controlled under the Uniform Code of Military Justice. And for capabilities that are purchased as-a-service, military unique needs like surge demand requirements must be considered when writing contracts. But for capabilities for which it is appropriate, it provides DoD the ability to access the latest technology, with rapid technology refresh, without having to pay the entire bill. It also provides a solution to the flexibility and agility challenge DoD faces. Instead of designing and building a system over decades using RDT&E and Procurement, as-a-service acquisition allows DoD to enter a market within months using more flexible O&M funding and buy what it needs that year.



## Digital Transformation

Often called the fourth industrial revolution, 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.

The thread continues as systems are delivered with an updated digital twin matching the physical product for operations and sustainment. Digitalization can improve uptime and readiness, operational performance, predict failures, reduce sustainment costs, and support synthetic training environments.

DoD has begun to adopt these civilian sector innovations, but has a long way to go. Process reforms in acquisition and resource allocation can facilitate more rapid modernization, but they don’t accelerate modernization by themselves. Adopting modern business processes like digital transformation is the key to accelerating modernization.

Finally, this may be the hardest challenge the Commission tries to tackle. It will take the most careful analysis and the most creative thinking to identify actual solutions and not lose time going down “rabbit holes” that don’t lead to productive reforms. For example, one major challenge for DoD in adopting advancing technology is the “valley of death.” Some commentators have attributed this problem to the PPBE system and argued that fixing the valley of death should be a primary purpose of PPBE reform. The truth is more complicated than that. The call out box below explains the valley of death and its relationship to the PPBE system.

## Valley of Death

In its simplest form, 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 technologists. 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 traditional definition of valley of death is when a DoD funded project fails to transition from one of these steps to the next. A project can be funded in S&T, succeed, and then not be funded by the developers. Similarly, a project can successfully complete development and not be funded by procurers and fielders.

For these transition problems, PPBE is not a cause of the valley of death and, in fact, is part of the solution. The FYDP used in the PPBE process provides a multi-year plan of resources so that an S&T organization initiating a new project that is expected to take, for example, three years can observe in the FYDP if the development community has funded it three years later. Similarly, a developer initiating a project can observe if the procurer has funded it at the appropriate year in the FYDP. Without the FYDP and programming phase of the PPBE system, there would be no data base or process to initiate and validate these funding decisions.

In these cases, 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.

With the significant shift from DoD funded S&T and development to commercial investor funding in many new high technology growth areas, 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.

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.

## Use Realized Performance Data

A third key area where progress could be made is in increasing the use of program evaluation and performance data in the PPBE process. Too often the PPBE system operates in an insular way, working off its own baselines with, at best, an ad hoc and incomplete incorporation of financial execution results, experienced performance levels, and congressional marks. The Government Performance and Results Act (GPRA) of 1993 and the GPRA Modernization Act of 2010 tried to bridge the measurement of realized performance with budget formulation, but DoD has never fully embraced the spirit of these laws.

DoD's challenge is harder than many other federal agencies because it executes its mission on a contingency basis, rather than a steady-state basis. Major wars with a near-peer adversary are, fortunately, infrequent and there is limited actual outcome performance data from operations. This is a different situation than at many federal agencies. At DHS, for example, Border Patrol agents apprehend thousands of illegal border crossers every month and the Transportation Security Administration screens millions of travelers every day. Senior leaders can try experiments like testing policies in one location before implementing them organization wide. Extensive operational data are available and empirical analyses can be conducted with these data to inform resource allocation decisions.

But 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, the lead analytic organization of DoD and the primary integrator of the PPBE system, provides a vivid illustration of the challenges currently experienced at DoD. 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. The callout boxes below provide two recent examples of challenges that have arisen because of the institutional bias for simulation modeling when empirical analysis of realized performance data is the more appropriate methodology.

### Basic Training During COVID Pandemic

As the full extent of the COVID pandemic began to be realized in the spring of 2020, DoD faced many significant decisions as it tried to prevent the spread of COVID while maintaining its readiness in case an adversary used the pandemic for opportunistic aggression. One key decision was whether to stop DoD accessions and shut down basic training for an extended period of time. Basic training requires taking Americans from all over the country and concentrating them for a period of intense, close personal contact. The COVID risks to basic training were significant, but stopping the pipeline of new service members would create a readiness risk that would long outlive the pandemic.

### Basic Training During COVID Pandemic

To support this key programmatic decision, CAPE was asked to assess the likely impacts of a COVID outbreak in basic training. Consistent with the public health community's analytic approach, CAPE used a science-based simulation methodology to project the impacts of an outbreak. The modeling results were dire, an outbreak would likely spread rapidly through the basic training population and result in thousands of cases with large numbers of recruits hospitalized and some dying.

What CAPE did not do was look at what was happening on the ground at basic training locations. In fact, DoD had already had two outbreaks in basic training locations at the time of the analysis. Through aggressive containment, both outbreaks had been stopped at around forty known cases with minimal health consequences and no deaths. When presented with simulation results so at odds with actual experience on the ground, senior leaders did not have confidence in the CAPE analysis. After a short pause DoD continued with basic training and was able to control outbreaks like it had the first two, never experiencing the dire forecasts of the simulation analysis.

The author was the director of CAPE at this time. The team conducting the research were expert analysts that routinely produced high quality research for senior leaders. The simulation analysis was quantitatively rigorous and expertly implemented. But it also ignored reality on the ground. The institutional bias to use simulation even in situations where realized performance data are readily available caused the organization to use the wrong methodology for the problem at hand and senior leaders to have to make decisions in the absence of relevant analysis.

### Recapturing Care in Military Hospitals

One of the largest budget items in DoD is healthcare. The previously mentioned DHP appropriation is about \$35 billion per year and when the healthcare costs from other budget accounts are added the total annual cost exceeds \$50 billion per year. Because, in part, of the management challenges discussed earlier, healthcare also happens to be one of the most inefficient expenditures in the defense budget with the largest potential for reform savings. Significant reform efforts are launched every few years, but with the skewed incentives created by a poorly designed account structure progress has been very hard to make.

DoD operates about fifty military hospitals that provide about one-third of beneficiary healthcare (the remainder is purchased from private sector healthcare providers). One of the biggest sources of inefficiency is the low productivity of these military hospitals, often experiencing half the average occupancy of civilian hospitals and as little as one-tenth the provider productivity. One recurring pattern is that a new round of reforms will be initiated, institutional resistance will intensify, and the medical community will offer as an alternative to the intended reform to "recapture" care from the (variable cost) private sector care contracts to the (fixed cost) military hospitals—saving money and increasing productivity.

### Recapturing Care in Military Hospitals

The author has seen this cycle repeat itself about every five to six years for the last twenty years. After a year or two of highly contentious reform discussions, the recapture plan gets brought out as an easy compromise to cool off the heated debate and let all sides claim some victory. The analysis to support the recapture plan is simulation based on how much workload is in the private sector around each military hospital and assumptions about how much can be brought back in to the MTFs.

A few years ago the Center for Naval Analyses (CNA) conducted an empirical analysis to see what actually happened from two recent recapture efforts (Levy (2016) and Levy et. al. (2017)). CNA found that the efforts (cancelling civilian primary care managers for beneficiaries in Portsmouth, Virginia, and Jacksonville, Florida) did bring some primary care into the military hospitals, but resulted in specialty care leaving the hospital with little impact on overall procedure volume or cost (in some cases cost actually increased). Not surprisingly, hospital performance is a complex issue driven by incentives and management structures that simple simulation models have little hope of capturing.

Never to be deterred by actual experience, DoD launched another round of recapture reforms in the last PPBE cycle using simulation models of recapturable care.

The fourth key deputate of CAPE provides an interesting contrast. The acquisition cost estimating divisions in CAPE are the opposite of the other deputates and focus exclusively on empirical analysis. Cost growth in weapons system procurement is an age-old problem for the military (and most other acquiring elements of the government). 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.

A bigger and more structural reform would be to establish a retrospective program evaluation function. A key responsibility of CAPE is to lead annual strategic portfolio reviews, which are forward-looking studies designed to inform the subsequent program review and development of the FYDP. However, neither CAPE or Comptroller have a dedicated (retrospective) program-evaluation function that assesses the outcome of previous decisions (in contrast to the cost-estimating function, which focuses very closely on realized program costs to forecast costs into the future). Designing a feedback loop, such as a final evaluation or assessment phase, to fully integrate execution and performance data into the planning, programming, and budget

formulation phases of PPBE could significantly improve the quality of Defense Department decision making. This function has been successfully adopted elsewhere in the national security community—including at the Office of the Director of National Intelligence, where they perform annual retrospective strategic evaluation reports to complement their forward-looking studies.

There have been successful efforts in DoD to make greater use of realized data. The callout box below describes an Army execution review initiative that performs this function on financial execution data.

### **Commanders Accountability Execution Review**

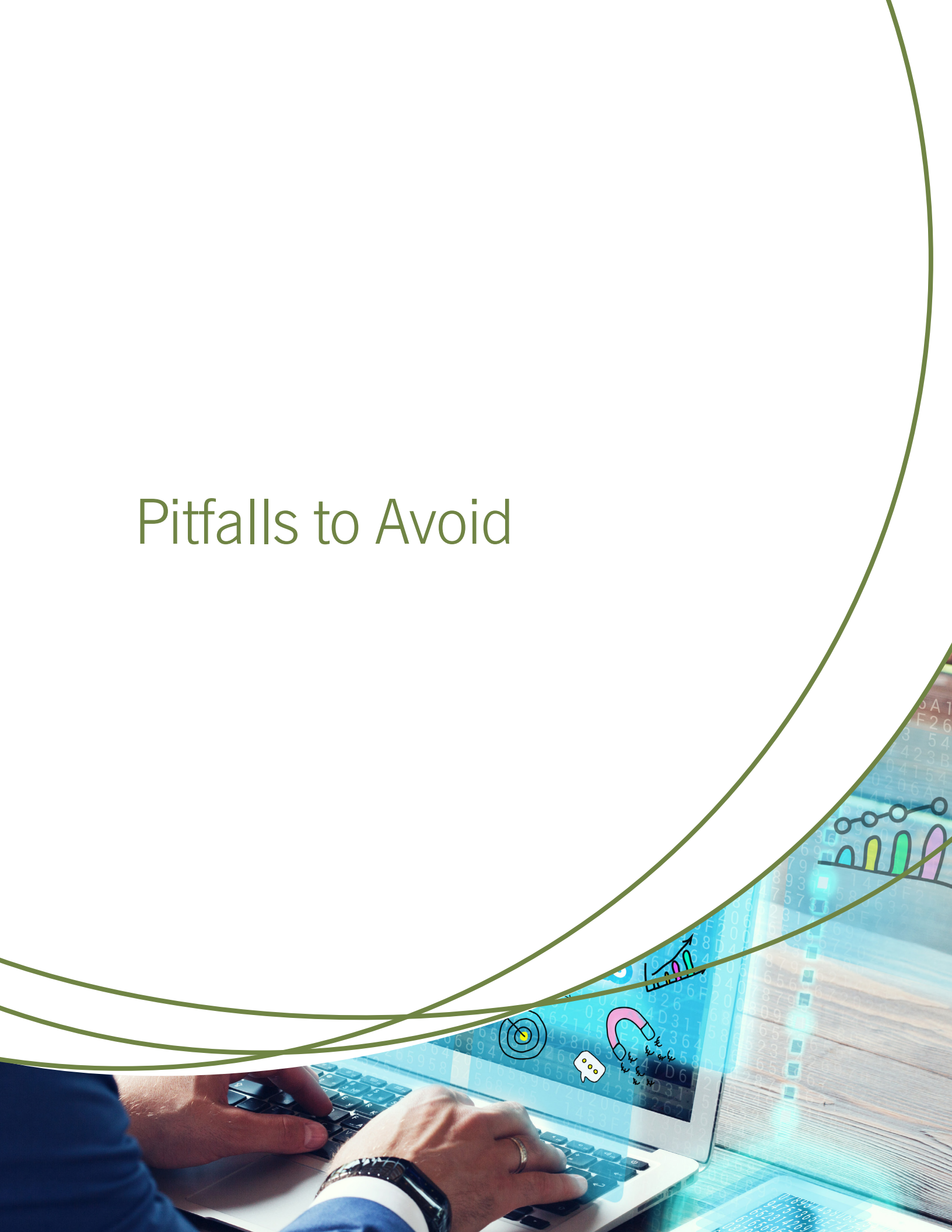
DoD appropriations have fixed time periods over which they can be obligated. At one year, O&M and MILPERS have the shortest window. It requires leadership engagement at all levels of command to ensure that funding gets fully spent in the most effective way possible. Deobligating funding after it has expired is a direct loss of buying power, but DoD has a history of high levels of deobligation.

The Army has historically experienced a three to five percent deobligation rate for O&M funding. For a \$70 billion per year account, this represents \$2.1-3.5 billion in lost buying power. To address this challenge, the Army implemented a Commanders Accountability Execution Review (CAER) program in 2018 (Horlander (2019)).

A key characteristic of CAER is that it is not just a typical government financial execution review program. First, it is an organized program of data generation and reporting on obligation, deobligation, and program data by organization and function. Second, it uses this realized financial and performance data in a structured series of meetings with senior Army leadership to drive decision making across the organization. Third, it provides direct, quantitative measures of accountability senior leaders are using for Army commands.

In its first two years, CAER reduced O&M deobligations by 50 percent. It also led to ongoing reform agendas for contracting, supplies, and transportation—three of the biggest deobligation drivers. The Army, and DoD, have a long way to go to institutionalize the use of realized financial and performance data in the PPBE system, but initiatives like CAER and the financial statement audit have put key building blocks into place.

# Pitfalls to Avoid



The main focus of this report is on key problems the PPBE Commission should address to improve DoD resource allocation. There have been many PPBE reform efforts in the past and, unfortunately, some have not had the successful impact that was hoped for. One reason for this lack of success is failing to dig deep enough to understand the root causes of problems or failing to take into account very real constraints faced by senior leadership in making resource allocation decisions. To help the Commission avoid these pitfalls, this chapter lists mistakes the author has seen made in past reform efforts with DoD.



First, reformers shouldn't try to eliminate the reality of resource scarcity with process changes—it is not possible. Perhaps the most common complaint the Commission will hear about DoD's PPBE system is that the process is flawed because the witness's program, or the program that they think is most important, didn't get funded. But this is not a flaw in the PPBE process, it's the key feature. Allocating scarce resources is a tough job. Not everyone is going to get the money they want. A strength of the PPBE process, when it's functioning properly, is the disciplined way in which it encourages the use of analysis to create clear choices for senior decision makers. There is no process reform that eliminates the challenge of resource scarcity and the necessity for making decisions about what to fund and what not to fund.



Second, reformers shouldn't try to fix bad leadership with process changes—another impossibility. Perhaps the second most common complaint that the commissioners will hear is that the PPBE process is broken because resource decisions are too often driven by bureaucratic interests, congressional politics, or the emotion of the moment. The author has seen many examples where this may have been the case. But any decision process, PPBE or otherwise, is going to tee up decisions to a leader. The best that any process can do is encourage transparency and structure, bringing all points of view to the decision maker and supporting them with the best possible analysis. No process can ensure good leadership or insulate senior leaders from the parochial interests within the department and from Congress, and only the accountable decision maker can judge when those interests should outweigh the analytic merits of another option. Process reforms that are intended to constrain decision makers would be a step in the wrong direction and will not succeed.



Third, reformers shouldn't ignore incentives. Incentives matter—they are what govern and shape the behavior of decision makers at every level of an organization. Participants in the PPBE system pursue their own and their organization's priorities—usually expressed as obtaining support (and a larger budget) for their program. This is completely natural and understandable. They likely worked much of their career in this area and truly believe it is the most important element of national security. The PPBE system is a competitive framework that tries to channel this energy into producing analytic justifications for budgetary decisions so that competing alternatives for the use of available resources can be evaluated by senior leaders. There is no process reform that will change the behavior of people. Reform should be based on an understanding of individual and organizational motivation and should attempt to harness it for the accomplishment of national security goals.



Fourth, reformers shouldn't ignore Congress and the realities of government management. Government organizations typically do not have clear, objective measures of performance like the private sector (e.g., profit). This means that program performance is often difficult to objectively measure and much of governance is more focused on oversight and control of public spending (e.g., preventing misuse of taxpayer dollars) than it is on accomplishing its mission. And this emphasis on oversight can come at the expense of agility. Congress is not going to give up its control of taxpayer



resources and recommendations to give officials blank checks are not going to be adopted. Successful reform should avoid a zero-sum competition between control of funds and agility and instead focus on finding reforms that advance the priorities of both branches of government.



Finally, reformers should avoid recommendations to legislate a policy process. The PPBE process is executive-branch policy. It can be changed at any time to meet the needs of the Defense Department leadership. This is a fundamental difference from acquisition reform. The acquisition process governs the department's interaction with the private sector. That is a regulatory process. The defense budget presented to Congress is a policy document providing the policy choices of executive-branch leaders. Attempts to codify specific resource allocation processes internal to the department will make the process more antiquated (over time), slower, and less able to meet national security needs.



# CONCLUSION

In an increasingly dangerous world with near-peer competitors investing rapidly and behaving more aggressively, improving DoD resource allocation is a national security imperative. The PPBE Commission has a significant opportunity to aid this important effort. To have this impact, it should focus on tangible problems like the lack of strategic analysis, improving speed and agility, and increasing the empirical grounding of analyses. It must dig deep enough into these challenges to identify root causes and structural solutions. And it must avoid common pitfalls that have plagued previous efforts at reform.

The Commission should also keep in mind that process changes can enable desired outcomes, but cannot achieve them by themselves. In short, process changes are necessary but not sufficient. To improve strategic decisions, new tools must be developed, data collected, and analyses conducted. To accelerate modernization, new business practices like digital transformation and as-a-service purchasing must be adopted. To ground resource allocation decisions in reality and avoid repeating the mistakes of the past, DoD must actually collect, report, analyze, and use realized performance data. The commission should consider potential recommendations in the context of bureaucratic incentives, cost, and feasibility to ensure the recommendations can actually be implemented and will drive the desired changes in behavior within DoD.

Finally, in an area not addressed in this report, the Commission must consider organizational and institutional arrangements within DoD. The PPBE process guides resource allocation decisions, but it does so within the structure that exists when the decisions are made. For example, funding for depot maintenance was historically provided directly to the depots. Over time, this was found to create perverse incentives. Operating forces viewed depot maintenance as a free good and demanded unlimited amounts. Depots had little incentive to measure and control costs. Because of these challenges, over many years the structure was changed. Now, in most cases, maintenance funding is provided to the operating forces, they purchase depot maintenance from the depots from within their budgets weighing the alternative uses of the funding in the production of readiness, and the depots operate as close as possible to a business in a working capital fund.

This has changed the programming and budgeting decisions of the Secretary from centrally directing how many inputs to buy (e.g., how much depot maintenance to buy versus other inputs to readiness production) to a decision about outputs and outcomes (e.g., how much readiness to buy versus other outputs like modernization). With this change, depot maintenance funding shifted from a major time-consuming element of the PPBE process to a relatively minor one with most of the decision making delegated downwards to market-style relationships between DoD organizations. In contrast, the over \$20 billion in funding for military hospitals—a largely commercial activity like depots that provides an input to military capability—is directly budgeted, very contentious, and consumes significant senior leader time in the PPBE process, taking time away from mission focused decisions.

Shycoff (1995) provides a detailed review of these types of institutional arrangements like working capital funds, accrual funds, consolidating or disaggregating support functions, etc. and their effects on incentives and the PPBE process. The Commission should review these arrangements and make this an element of its reform agenda. Should military hospital funding be placed in a working capital fund, with their services purchased with transparent prices and the hospitals forced to live within their budgets? Should the health benefit be purchased from health insurance companies like most employer provided health coverage? Should compensation costs be consolidated into the MILPERS account? Should all future benefits be uniformly accrual funded like retired pay and the Medicare-eligible retiree healthcare benefit are now? How much of operating and sustainment costs should be paid by operating forces versus directly funded? There is a long list of potential opportunities for institutional reforms that could improve the PPBE process. Institutional reforms like these, combined with innovative business practices like digital transformation and as-a-service purchasing could give the Commission some of its biggest impacts.

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## ABOUT THE AUTHOR

**John Whitley** is currently a researcher and advisor with the Institute for Defense Analyses and other organizations. In government, he most recently served as the acting secretary of the Army and, prior to that, served as the assistant secretary of the Army for Financial Management and Comptroller and in acting positions as the director of Cost Assessment and Program Evaluation (DCAPE) and deputy chief management officer (DCMO) of DoD. In those positions, he led reform initiatives and, at CAPE, led DoD's resource allocation process (~\$700 billion per year), acquisition cost estimating, future force development, and analysis on a wide range of defense programs, including ship requirements, space capabilities, missile defense, nuclear modernization, and hypersonics.

Prior to returning to government, John spent eight years in federally funded research institutions, primarily at the Institute for Defense Analyses (IDA). His work at IDA included resource allocation and performance issues in national security, defense resource management analysis, military healthcare, and border security. He also served as a senior fellow at Center for Naval Analyses. In 2014 and 2015, he supported the Military Compensation and Retirement Modernization Commission in its healthcare work. Other roles have included adjunct lecturer at The George Washington University, director of Program Analysis and Evaluation at DHS, a defense fellow in the U.S. Senate in the office of Senator Jon Kyl of Arizona, as a staff economist at CAPE, and a faculty member in the economics department of the University of Adelaide in Australia. John also served in the U.S. Army.

John has a PhD and MA in economics from the University of Chicago and undergraduate degrees in Animal Science and Agricultural Economics from Virginia Tech. He lives in Alexandria, Virginia, with his wife and children.



JOHN WHITLEY



## KEY CONTACT INFORMATION

**John Whitley**

Institute for Defense Analyses  
730 East Glebe Road  
Alexandria, VA 22305

Phone: 703-845-2000

Email: [johnewhitley@comcast.net](mailto:johnewhitley@comcast.net)

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### For more information:

**Daniel J. Chenok**

Executive Director

IBM Center for The Business of Government

600 14th Street NW

Second Floor

Washington, D.C. 20005

(202) 551-9342

website: [www.businessofgovernment.org](http://www.businessofgovernment.org)

e-mail: [businessofgovernment@us.ibm.com](mailto:businessofgovernment@us.ibm.com)

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