## Recommendation 21: Refocus DoD's small business policies and programs to prioritize mission and advance warfighting capabilities and capacities.

### Problem

Today's increasingly complex and contested security environment places pressure on DoD to optimize warfighting capabilities and allocate its resources efficiently. Secretary of Defense James Mattis prioritized improving DoD's warfighting capabilities and lethality in his January 2017 memo, "Implementation Guidance for Budget Directives in the National Security Presidential Memorandum on Rebuilding the U.S. Armed Forces."[1] In his memo, Secretary Mattis stated that DoD will make "critical investments in advanced capabilities" as a means to "build a larger, more capable, and more lethal force."[2] Harnessing innovation is an essential component of DoD's Third Offset Strategy; however, DoD's slow acquisition system and ineffectiveness in engaging with small, innovative businesses, put DoD at risk of losing the race to advanced capabilities, as potential adversaries such as China work aggressively to acquire U.S. innovations and new technology.[3]

Small businesses produce many of the innovative capabilities, emerging technologies, and complex services DoD must acquire for warfighting dominance in a dynamic and uncertain strategic environment. Large contractors traditionally provide products and support to DoD yet studies indicate small companies are more innovative per dollar of research and development funds spent and per employee than large firms.[4] Therefore, DoD's challenges in working effectively with small businesses to address critical needs and achieve the strategic objectives of DoD are of substantial concern.

DoD would benefit if it aligned its acquisitions from small business with its strategic priorities of improving warfighting capabilities and lethality, as well as the Third Offset. Instead, DoD's small business policies and programs currently focus on acquiring supplies and services that further socioeconomic goals but do not fully leverage innovative and unique capabilities of small businesses to support DoD's mission. A complex and cumbersome acquisition system, coupled with few clear entry

[1] Implementation Guidance for Budget Directives in the National Security Presidential Memorandum on Rebuilding the U.S. Armed Forces, Memorandum from Secretary of Defense (2017).
[2] Ibid.
[3] Paul Mozur and Jane Perlez, "China Bets on Sensitive U.S. Start-Ups, Worrying the Pentagon," New York Times (2017), accessed January 2, 2018, https://www.nytimes.com/2017/03/22/technology/china-defense-start-ups.html?emc=edit_dk_20170323&nl=dealbook&nlid=69253745&ref=dealbook&te=1&_r=1. Supporting journalistic reporting on Chinese government investment into U.S. technologies with potential defense applications, four companies in the San Francisco area and three venture capitalists independently informed the Section 809 Panel that Chinese government-backed firms are increasingly pursuing acquisition of U.S. companies, start-ups, and technologies.
[4] Jose M. Plehn-Dujowich, *Product Innovation by Young and Small Firms*, accessed August 4, 2017, https://www.sba.gov/sites/default/files/files/rs408tot.pdf. Anthony Breitzman, D. Hicks, M. Albert, *Small Firms and Technology: Acquisitions, Inventor Movement, and Technology Transfer,* accessed August 4, 2017, http://rdw.rowan.edu/cgi/viewcontent.cgi?article=1012&context=csm_facpub. Diana Hicks and Anthony Breitzman, *Small Serial Innovators: The Small Firm Contribution to Technical Change,* 2003, accessed August 4, 2017, http://rdw.rowan.edu/cgi/viewcontent.cgi?article=1038&context=csm_facpub. Anthony Breitzman and Patrick Thomas, *Analysis of Small Business Innovation in Green Technologies,* accessed August 4, 2017, https://www.nist.gov/sites/default/files/documents/2017/05/09/analysis-of-SM-innovation-Technologies.pdf.

points into the defense market and uncoordinated outreach to small businesses, deters many small businesses from pursuing DoD as a customer.

## Background

DoD has an extensive history of supporting small businesses. Congress first tasked DoD with establishing a small business program in the Armed Services Procurement Act of 1947.[5] The 1953 Small Business Act also explicitly linked small business set-asides to DoD's core mission of national defense. Section 214 of the Act read,

> *To effectuate the purposes of this title, small-business concerns within the meaning of this title shall receive any award or contract of any part thereof as to which it is determined by the Administration and the contracting procurement agency (A) to be in the interest of mobilizing the Nation's full productive capacity, or (B) to be in the interest of war or national defense programs.*[6]

With a large budget and extensive presence across the country, DoD has played, and continues to play, a substantial role in achieving Congress's goal of supporting small American businesses. In 1958, the Small Business Act minimized the importance of using set-asides to fulfill national defense needs in favor of maximizing benefits to small businesses by requiring a *fair portion* of contracts for property and services go to small businesses in each industry category.[7] Concerns that small businesses could not win a *fair portion* of contracts, however, ultimately led to Congress creating set-asides for minority-owned small businesses via amendments to the Small Business Act in 1978.[8] The statute now emphasizes the role of small business set-asides and programs in furthering socio–economic policy objectives and supporting the U.S. economy.[9]

The Small Business Act, as it stands today, does not state a goal for government agencies to leverage small businesses as a means to enhance or support mission execution. The statute includes a reference that the American economic system of private enterprise and competition is essential to the "security of this Nation," but contains no direct references to agency missions or national defense.[10] DoD's small business activities are dollar-goal-oriented, with little focus on supporting the warfighter and DoD's mission. Furthermore, small business provisions and programs in statute today are codified in a disorganized manner, making it difficult for both government and the private sector to understand and follow relevant statute.

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[5] Section 202 of the 1947 Armed Services Procurement Act stated, "It is the declared policy of the Congress that a fair proportion of the total purchases and contracts for supplies and services for the Government shall be placed with small business concerns. Whenever it is proposed to make a contract or purchase in excess of $10,000 by negotiation and without advertising, pursuant to the authority of paragraph (7) or (8) of section 2 (c) of this Act, suitable advance publicity, as determined by the agency head with due regard to the type of supplies involved and other relevant considerations, shall be given for a period of at least fifteen days, wherever practicable, as determined by the agency head."

[6] Small Business Act of 1953, Pub. L. No. 163-83, 67 Stat. 238 (1953).

[7] Andrew G. Sakallaris, "Questioning the Sacred Cow: Reexamining the Justifications for Small Business Set Asides," *Public Contract Law Journal,* 36 (2007): 685-700. Small Business Act of 1953, Pub. L. No. 16-83, 67 Stat. 238 (1953).

[8] Andrew G. Sakallaris, "Questioning the Sacred Cow: Reexamining the Justifications for Small Business Set Asides," *Public Contract Law Journal,* 36 (2007): 685-700.

[9] Aid to Small Business, 15 U.S.C. Chapter 14a.

[10] Declaration of Policy, 15 U.S.C. § 631.

## Findings

### *DoD's Lack of a Coherent Small Business Strategy*

A principal challenge for DoD is establishing a coherent strategy and infrastructure for aligning small business programs and policies with DoD's mission-related needs. A number of previous advisory groups have identified challenges related to DoD's lack of a strategic approach to working with industry. For example, a 2012 report produced by the House Committee on Armed Services Panel on Business Challenges noted, "[T]he Panel found that DoD lacks a clearly articulated strategy that would provide a corporate vision of DoD's future technology needs."[11] A decline of nearly 100,000 small companies registered in the System for Award Management (SAM) to do business with the federal government since 2012[12] may be one issue cause by a lack of strategy. Steve Chabot, in 2015 testimony before the U.S. House of Representatives Committee on Armed Services, noted a lack of policy for driving small businesses toward "gaps in our industrial base."[13] Although this lack of policy was framed as a governmentwide problem, it is consistent with the Section 809 Panel's finding that DoD lacks an effective small business strategy.

Numerous offices and organizations exist across DoD to either shape the industrial base or promote small business use across the department. Examples of such offices include the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (DASD(MIBP)), Office of Small Business Programs (OSBP), and Defense Logistics Agency (DLA) Office of Small Business Programs.[14] Coordination among small-business-related offices and DASD(MIBP) is minimal, which has resulted in a disjointed and incomplete view of small business capabilities and innovations, as well as their importance to the health and robustness of the defense market.

DASD(MIBP) conducts analyses of the defense base to ensure critical capabilities and systems are protected and preserved. DASD(MIBP) does not place meaningful or specific focus on critical capabilities or emerging technologies developed by small businesses. For example, the *2015 Annual Industrial Capabilities Report to Congress* produced by DASD(MIBP) does not indicate an industrial base analysis was conducted to identify unique capabilities or preserve critical skills among small technology companies.[15] Although the report references establishment of Defense Innovation Unit Experimental (DIUx), it includes no information to suggest a robust industrial base assessment of small technology firms and start-ups has occurred.[16] Not including a thorough assessment of small businesses or technology in the report suggests DoD has not paid sufficient attention to either component as being critical to the defense market and enablers of DoD's strategic imperatives.

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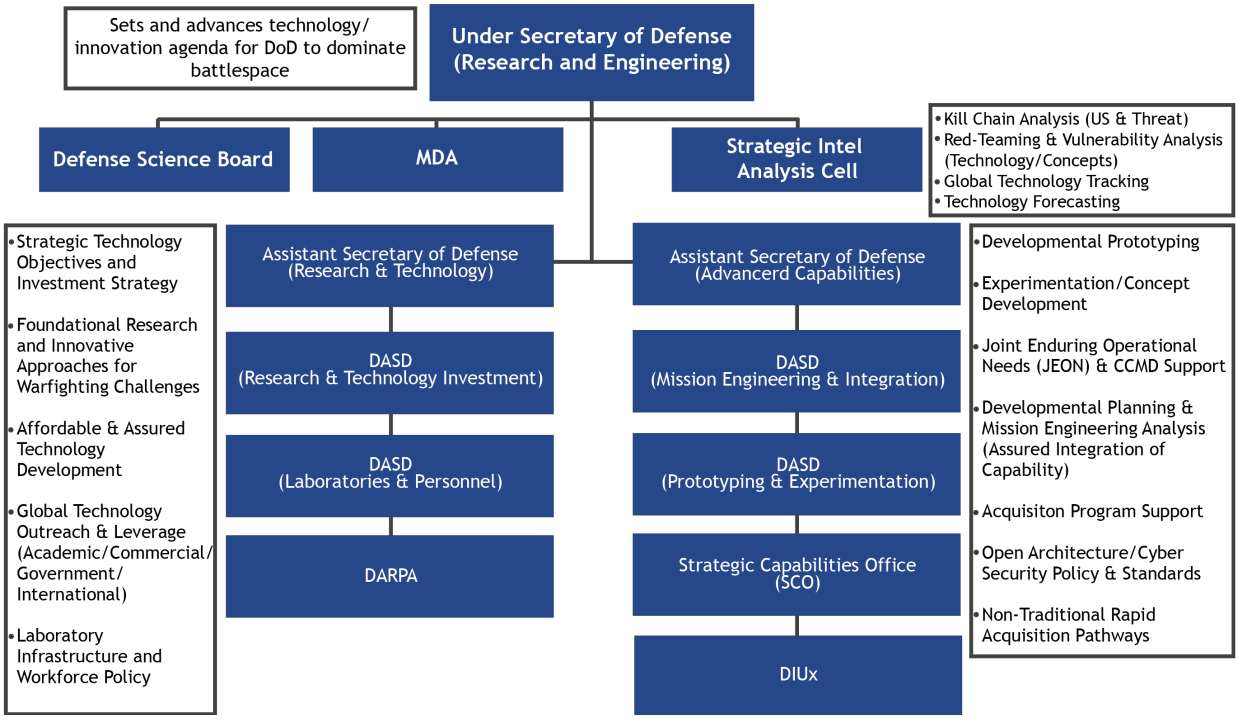
[11] Panel on Business Challenges in Defense Industry, *Challenges to Doing Business with the Department of Defense: Findings of the Panel on Business Challenges in Defense Industry,* March 2012, vii, accessed November 7, 2017, https://wcoeusa.org/sites/default/files/Challenges%20to%20Bus%20with%20DOD.3.12.pdf.
[12] Steve Chabot, Chairman, Committee on Small Business, testimony before U.S. House of Representatives Committee on Armed Services, April 14, 2015, accessed November 8, 2017, https://smallbusiness.house.gov/uploadedfiles/chabot_written_statement_fy_16_ndaa.pdf.
[13] Ibid.
[14] DLA's Office of Small Business Programs administers the Procurement Technical Assistance Program.
[15] OSD(AT&L), *Annual Industrial Capabilities Report to Congress for 2015,* accessed August 4, 2017, http://www.acq.osd.mil/mibp/resources/2015%20AIC%20RTC%2010-03-16%20-%20Public%20Unclassified.pdf.
[16] Ibid.

OSBP oversees DoD's implementation of small business policies and programs such as the 8(a) Business Development Program set-asides, SBIR, STTR, and RIF through small business offices across DoD. OSBP focuses on ensuring DoD's compliance with statutorily established small business contracting goals and administration of programs such as SBIR, STTR, and RIF. Data gathered in interviews conducted by the Section 809 Panel indicate there is no system or recurring dialogue between DASD(MIBP) and OSBP to align small business program objectives with critical needs in the broader defense market.

DLA administers the Procurement Technical Assistance Program (PTAP), which is designed to help small businesses enter the government market and navigate government contracting. DLA's administration of the program, prescribed in statute,[17] lacks a clear link to DASD(MIBP) or OSBP priorities, much less the SBA. Disjointedness among PTAP, industry, and DoD small business organizations is not new. In FY 1997 DLA unsuccessfully recommended repeal of Chapter 142 of Title 10, which requires DLA to administer PTAP, citing overlap between PTAP and SBA's Small Business Development Center (SBDC) program.[18] (PTAP is discussed again in greater detail below).

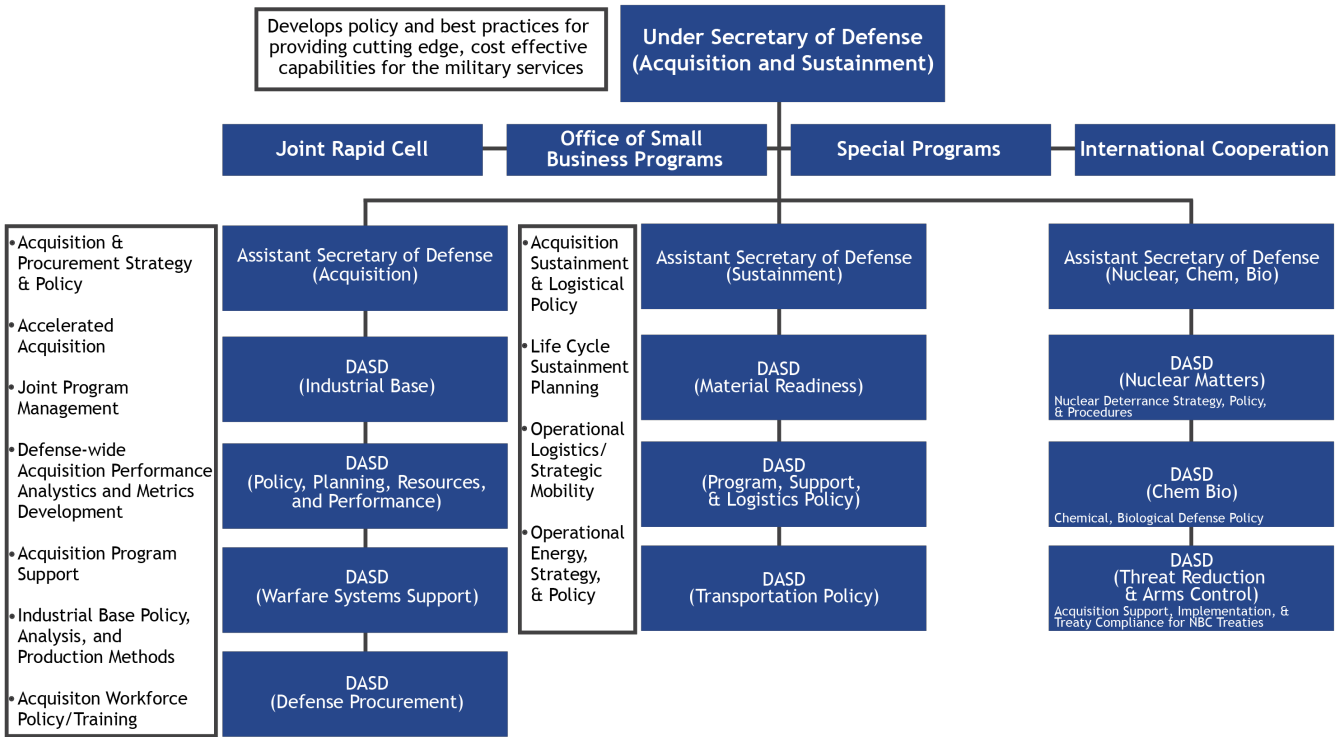
**Figure 6-1. Proposed USD(R&E) Organization**




*Source: Report to Congress, August 2017*[19]

[17] Cooperative Agreements, 10 U.S.C. § 2413.
[18] Office of the Inspector General, Department of Defense Procurement Technical Assistance Cooperative Agreement Program, accessed August 4, 2017, http://www.dodig.mil/Audit/reports/FY97/97-007.pdf.
[19] DoD, *Report to Congress: Restructuring the Department of Defense Acquisition, Technology and Logistics Organization and Chief Management Officer Organization,* August 2017, accessed November 8, 2017, https://www.sba.gov/sites/default/files/articles/FY2017_Final_Agency_Goals_Spreadsheet_20161201.pdf.

**Figure 6-2. Proposed USD(A&S) Organization**




*Source: Report to Congress, August 2017*[20]

A proposed reorganized structure was released in August 2017 outlining a potential realignment of USD(AT&L) functions under an Under Secretary of Defense (Research and Engineering) (USD[R&E]) and Under Secretary of Defense (Acquisition and Sustainment) (USD[A&S]) (see Figures 6-1 and 6-2 above). Of note, the proposal includes giving USD(A&S) responsibility for DASD(MIBP)'s current portfolio of industrial base policy and analysis, as well as oversight of DoD's OSBP. The proposal leaves OSBP as a distinct office, answering to USD(A&S).

The proposal further suggests realigning the SBIR, STTR, and RIF programs to fall under USD(R&E) instead of the OSBP.[21] DIUx, tasked with helping attract innovative companies and commercial technologies into the defense market, also would be aligned to USD(R&E). Moving SBIR, STTR, and RIF under USD(R&E) is a positive step toward aligning small business programs with acquiring innovations that enhance DoD's mission-essential capabilities. The proposed reorganization, however, does not clearly address the need to create a coordinated outreach program, identify clear points of entry for companies seeking to enter the defense market (discussed below), or the need for greater alignment of small business policy and programs with needs across the broader defense market.

[20] Ibid.
[21] Ibid.

Coupled with a disjointed management structure (at least as offices and programs are arranged currently), DoD's small business use is driven by the dollar value of contracts awarded to small businesses with little regard for effect on DoD's mission. This situation may be due in some part to the fact that for FY 2017, DoD set a target for at least 22 percent of its government prime contract dollars to be awarded to small businesses and small, disadvantaged businesses.[22] Five percent of prime contracts and 5 percent of subcontracts are to be awarded to women-owned small businesses; 5 percent to disadvantaged business owners; 3 percent to HUBZone small businesses; and 3 percent to service-disabled, veteran-owned small businesses.[23]

Contracting officers and program managers, not DoD's small business specialists, are held accountable for ensuring small businesses receive contracts, small business requirements are met, and goals are achieved. As a result, small business programs focus almost exclusively on the amount of money and number of contracts awarded to small businesses.[24] One RAND study notes,

> *Small business utilization is generally judged on input. That is, the entire goal-setting process, as well as data collection on its effects and reporting of its results, is geared to measuring the dollars and contracts awarded to small business.*[25]

Although small business specialists in the field conduct outreach to the small business community, the Section 809 Panel did not find any information to indicate outreach is informed by a strategy or aligned to mission-related needs.

Multiple experts with whom the Section 809 Panel spoke indicated most DoD small business contracts go toward procuring basic services and commodities, given an almost singular focus on the aggregate dollar value of small business contracts.[26] It is easier and less risky for contracting officers to meet their contracting goals by acquiring basic commodities and services than it is to conduct market research and find new small businesses with which to work; available data confirm this assertion. Small businesses disproportionately account for the acquisition of basic commodities and services like administrative support, construction, building and grounds maintenance, and food-related support. FY 2017's top-10 DoD obligations to small businesses (see Table 6-1), as a percentage of DoD's total reported obligations, shows small businesses account for approximately 94 percent of obligated dollars toward fruits and vegetables; 83 percent toward maintenance of *other* administrative facilities and service buildings; and 90 percent toward highway and road maintenance.[27]

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[22] Small Business Administration, Small Business Procurement—Final FY2017 Goals—As of 12/01/16, accessed Dec. 8, 2017, https://www.sba.gov/sites/default/files/articles/FY2017_Final_Agency_Goals_Spreadsheet_20161201.pdf.
[23] "Goaling," U.S. Small Business Administration, accessed August 4, 2017, https://www.sba.gov/contracting/contracting-officials/goaling.
[24] The Section 809 Panel arrived at this finding through interviews with senior officials and staff responsible for small business policy and programs across DoD and Small Business Administration.
[25] Clifford A. Grammich, et al., *Small Business and Defense Acquisitions: A Review of Policies and Current Practices,* RAND National Defense Research Institute (2011), 35, accessed November 8, 2017, http://www.dtic.mil/dtic/tr/fulltext/u2/a551005.pdf.
[26] There is no definition in the FAR for the term *commodity*. For the purposes of this paper, the Section 809 Panel refers to the Merriam-Webster definition of a commodity as "an economic good, such as a mass-produced unspecialized product."
[27] Calculations based on Product and Service Code (PSC) contract obligation data retrieved from the Federal Procurement Data System as of January 2, 2018. Categories refer to PSC 8915: Fruits and vegetables; PSC Z1AZ: Other administrative facilities and service buildings maintenance services; and PSC Z1LB: Highways, roads, streets, bridges, and railways maintenance services.

**Table 6-1. Top Ten FY 2017 DoD Obligations to Small Businesses as a Percentage of Total FY 2017 DoD Obligations (for total obligations more than $100 million)**[28]

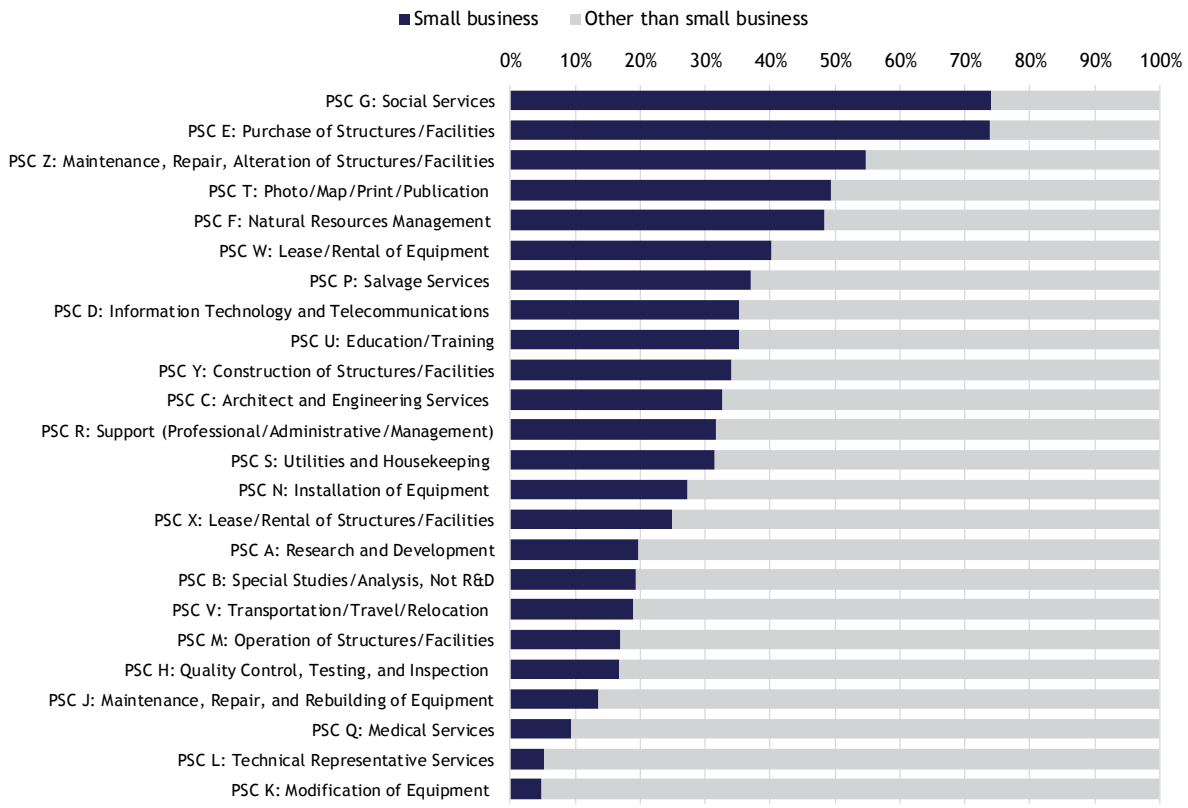
| PSC and Description | Small business USD obligations | Percent small business |
|---|---|---|
| PSC Y1BF: Missile system facilities construction services | $121.8 million | 98.9% |
| PSC 4220: Marine lifesaving and diving equipment | $1.69 billion | 97.6% |
| PSC Z2EB: Maintenance buildings repair or alteration services | $152.2 million | 93.9% |
| PSC 8915: Fruits and vegetables | $100.1 million | 93.5% |
| PSC Z1LB: Highways, roads, streets, bridges, and railways maintenance services | $107.7 million | 89.9% |
| PSC AC32: Ships applied research and exploratory development defense systems R&D | $109.1 million | 89.7% |
| PSC Z2EZ: Other industrial buildings repair or alteration services | $119.9 million | 86.7% |
| PSC Z1JZ: Miscellaneous buildings maintenance services | $217.2 million | 85.0% |
| PSC AD22: Other applied research and exploratory development defense R&D services | $144.5 million | 84.5% |
| PSC Z1AZ: Other administrative facilities and service buildings maintenance services | $261.1 million | 83.1% |

Further analysis of FPDS data indicates that approximately 55 percent of all obligated dollars for maintenance, repair, and alteration of structures and facilities went to small businesses in 2017.[29] By contrast, only 20 percent of R&D-related dollars went to small businesses.[30] DoD's dollars obligated to small businesses ultimately skew toward acquiring commoditized and noninnovative products and services (see Figure 6-3).

Meeting small business goals by acquiring basic commodities and services, rather than obtaining innovative products and support from small companies, will ultimately hurt DoD's ability to maintain warfighting dominance. Research shows small businesses can provide advanced capabilities and support to DoD; however, data show DoD is not prioritizing working with small businesses to acquire innovation and technology. According to one study, small companies generate "13 to 14 times more patents per employee" and produce more cutting-edge technologies than large companies.[31] Large companies in the technology industry with which the Section 809 Panel met indicated small businesses often are more innovative and capable of developing unique solutions for their customers. DoD is not capitalizing on the innovative potential of small businesses; the majority of DoD's small business contracts do not prioritize or align with its mission and warfighting needs.

[28] Data retrieved from FPDS on January 2, 2018.
[29] Calculations based on PSC contract obligation data retrieved from the Federal Procurement Data System on January 2, 2018. Categories refer to PSC Z (maintenance, repair, alteration of structures/facilities) and PSC A (research and development).
[30] Ibid.
[31] Diana Hicks and Anthony Breitzman, *Small Serial Innovators: The Small Firm Contribution to Technical Change,* 2003, accessed August 4, 2017, http://rdw.rowan.edu/cgi/viewcontent.cgi?article=1038&context=csm_facpub.

**Figure 6-3. Percentage of DoD Contract Dollars Obligated to Small Business, by Service Contract Category[32]**




In addition to potentially undermining the acquisition community's focus on furthering DoD's core mission, DoD's current approach to working with small businesses may not support DoD's long-term interests. The number of small business contract actions dropped nearly 70 percent from FY 2011 to FY 2016, but during that same timeframe the value of DoD small business contracts rose approximately 290 percent.[33] Small companies are receiving contracts of substantial value from the government, including DoD, but the decline in the number of small business contract actions indicates DoD's small business contracting is not promoting competition and fostering robustness in the defense market.

Small business programs, such as the 8(a) Business Development Program and Mentor–Protégé Program, aim to help small businesses mature and become capable of handling larger prime contracts. In theory, helping companies mature promotes healthier competition for federal contracts; however, small companies that successfully grow beyond the small business threshold for their NAICS code must compete with large companies for contracts, putting *other than large* companies at a substantial disadvantage compared to large contractors. For example, SBA's Table of Small Business Size Standards indicates many technology-related companies have limited room to grow before becoming

[32] Data extracted from Federal Procurement Data System on January 2, 2018. Service contract categories represent PSCs aggregated at the one-digit level.
[33] Steve Chabot, Chairman, Committee on Small Business, testimony before U.S. House of Representatives Committee on Armed Services, April 14, 2015, accessed November 8, 2017, https://smallbusiness.house.gov/uploadedfiles/chabot_written_statement_fy_16_ndaa.pdf.

*other than small*. Companies offering custom computer programming services, for instance, cannot grow beyond $27.5 million in average annual revenue over the previous 3 years before losing their small business classification.[34] Companies that exceed this threshold must bid against large competitors that offer the same services such as Booz Allen Hamilton, Lockheed Martin, and Northrop Grumman, which respectively posted $5.4 billion, $47.2 billion, and $24.5 billion in revenue in FY 2016.[35] Many companies that are not small, but far from large, struggle to compete for government contracts against large, well-established companies without set-aside programs and other support.

This structure incentivizes small companies to adopt strategies that may be inconsistent with DoD's interests and small business programs' goals. For example, some small defense contractors adopt a practice of restricting their growth to ensure they retain their small business classification and maintain access to preferential contracting and small business programs.[36] This practice may run counter to DoD's interest in leveraging its small business programs, such as the 8(a) Business Development Program, to create greater robustness in the defense market.

Given the complexity and wide range of issue areas included in socio–economic programs and provisions, the Section 809 Panel will assess their effect on defense acquisition more fully in a subsequent report. The panel recognizes the importance of products and services to DoD that do not directly enhance warfighting capabilities or capacities and will outline alternative means for companies offering such support to sell to DoD in a future report.

### *Impediments to Working with Small, Innovative Companies*

The complexity and slowness of DoD's acquisition system impedes working with small, innovative companies. To better understand barriers to entry into the defense market for small businesses, the Section 809 Panel met with more than 50 small companies. Of those companies, at least 30 explicitly stated that doing business with DoD is too complex and burdensome. Many of these companies also stressed that the slowness of the acquisition system presents challenges. Small businesses, particularly those in the technology sector, operate on rapid business cycles. Such companies must raise funds at least every 12 to 18 months, yet according to one investor DoD often takes at least two years to award a contract.[37] The amount of time it takes DoD to get to *yes* on executing an acquisition, as well as the amount of time to say *no*, is especially problematic for small companies. In a meeting with the Section 809 Panel, Heidi Roizen, a renowned venture capitalist stated, "Companies would rather reach

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[34] U.S. Small Business Administration, *Table of Small Business Size Standards Matched to North American Industry Classification System Codes,* accessed August 4, 2017, https://www.sba.gov/sites/default/files/files/Size_Standards_Table.pdf.

[35] Booz Allen Hamilton Holding Corporation, *Form 10-K,* accessed August 4, 2017, http://investors.boozallen.com/secfiling.cfm?filingID=1443646-16-138#BAH-20160331X10K_HTM_S366CB8D67F54551397F4E49AC59D9239. Lockheed Martin Corporation, *2016 Annual Report,* accessed August 4, 2017, http://www.lockheedmartin.com/content/dam/lockheed/data/corporate/documents/2016-annual-report.pdf. Northrop Grumman, *2016 Annual Report,* accessed August 4, 2017, http://www.northropgrumman.com/AboutUs/AnnualReports/Documents/pdfs/2016_noc_ar.pdf.

[36] Donna Huneycutt, Wittenberg Weiner Consulting, presentation to Section 809 Panel, April 25, 2017. Jacques Gansler, William Lucyshyn, and Jinee Burdg, *Unintended Outcomes of Small Business Legislation & Policy: Opportunities for Improvement,* accessed August 4, 2017, https://www.publicpolicy.umd.edu/sites/default/files/SPP_Unintended%20Outcomes%20of%20Small%20Business%20Legislation%20and%20Policy_March%202015_FINAL_0.pdf.

[37] Heidi Roizen, DFJ Venture Capital, meeting with Section 809 Panel, February 16, 2017.

a quick 'no' than deal with a drawn-out 'maybe.' "[38] Setting aside time, personnel, and money to pursue business with DoD is too risky for many small companies.[39] Given the risks of relying on DoD for revenue, five of six venture capitalists with whom the Section 809 Panel met indicated they advise the companies in which they invest to avoid doing business with DoD.

Many companies not familiar with DoD struggle to understand requirements as they are articulated in requests for proposal. Acronyms and jargon that are widely used across DoD are not always comprehensible for small businesses lacking experience in the defense market, which leads them to develop proposals that are noncompliant with what DoD actually requires.[40] Similarly, DoD's workforce may not be sufficiently versed on the language used by small businesses, particularly those in the technology sector, and might pass on awarding contracts that would acquire potentially better technologies and solutions.[41]

Small companies also desire more open communication with DoD's acquisition community, much like the communication they have in private-sector acquisitions. A roundtable discussion with four small business in San Diego, CA, highlighted that small businesses experience barriers to entry into the defense market due to the inability to speak with DoD's acquisition officials to ask questions about requirements and receive feedback on proposals. DoD's lack of transparency and communication with small businesses subsequently leaves small companies struggling to learn and understand DoD's needs and expectations. This situation may lead to small businesses producing noncompliant proposals and missing opportunities. Some small companies indicated they need more communication and support to understand administrative requirements, such as how to certify compliance with complex legal liability and risk provisions included in many contracts, such as cyber security, counterfeit electronic parts controls, and export controls. Empowering and encouraging contracting officers to engage with small businesses and help them understand and navigate requirements and processes is one way to reduce such barriers to entry.

### *Need for Clear Entry Points and Effective Outreach*

Small and large businesses alike express frustration over the lack of clear entry points into the defense market. Companies can spend months or years searching for the appropriate person or office with the authority to initiate the acquisition process. For example, a San Francisco-based company met with multiple potential customers in DoD, and despite those potential customers expressing strong interest in acquiring the company's product, the company was unable to find a client with appropriate

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[38] Ibid.

[39] Scott Fredrick, NEA, meeting with Section 809 Panel, June 12, 2017. For further reports demonstrating the effects of complexity and slowness of the defense acquisition system on businesses, see also GAO, *Military Acquisitions: DoD is Taking Steps to Address Challenges Faced by Certain Companies,* accessed August 4, 2017, http://www.gao.gov/assets/690/686012.pdf. Panel on Business Challenges in Defense Industry, *Challenges to Doing Business with the Department of Defense: Findings of the Panel on Business Challenges in Defense Industry,* March 2012, accessed November 7, 2017, https://wcoeusa.org/sites/default/files/Challenges%20to%20Bus%20with%20DOD.3.12.pdf.

[40] Meagan Metzger, Dcode42, meeting with Section 809 Panel, March 29, 2017. Additionally, during a roundtable discussion with the Section 809 Panel on June 30, 2017, six small companies seeking entry into the defense market indicated requests for proposals and requirements often are unclear, making it difficult for small companies new to the defense market to understand client needs and offer effective solutions.

[41] Meagan Metzger, Dcode42, meeting with Section 809 Panel, June 30, 2017. Scott Fredrick, NEA, meeting with Section 809 Panel, June 12, 2017.

acquisition authorities to carry out the acquisition. Because of the cost and burden of pursuing DoD contracts, the company decided to abandon all efforts to work with DoD. This company was among 18 companies that told the Section 809 Panel they have no interest or plans to do business with DoD in the near future.

Anecdotal evidence gathered by the Section 809 Panel indicates that the example above is not a unique experience; companies with new technology unknown to DoD cannot easily introduce their products and services into the defense market, to the ultimate detriment of warfighters. Six California-based companies independently indicated similar challenges, stating to the Section 809 Panel they had *no idea where to begin* when it came to pursuing DoD contracts. Difficulties finding points of entry often lead to increased costs and burdens for companies actively seeking opportunities in the defense market. For instance, representatives from one small company that manufactures custom industrial equipment indicated their company outsources searching for requests for proposal, because it cannot afford to hire a team with the knowledge to find and pursue business opportunities with DoD.[42]

To understand what infrastructure exists to help companies to enter the defense market, the Section 809 Panel reviewed PTAP. Under the program, DoD established Procurement Technical Assistance Centers (PTACs) nationwide to help businesses "compete successfully in the government marketplace."[43] Awards are made annually to eligible entities (e.g., nonprofits, states, Indian tribes, and universities) to serve as PTACs, but due to cost-sharing requirements, becoming a PTAC often is unaffordable or unattractive to such entities.[44]

PTACs operating on a statewide basis can receive up to $750,000 per fiscal year, and those operating on *less than a statewide basis* can receive up to $450,000.[45] The centers must find matching funds, as DoD cannot bear more than 65 percent of the cost of providing assistance (or in the case of distressed areas, 75 percent of the cost).[46] For example, in the case of the San Diego PTAC, DoD provides $300,000 in funding per fiscal year, and the center must find matching funds from other sources, such as state and local governments.[47] Funds go to covering administrative costs, including salaries.[48] After covering such expenses, PTACs often find themselves with inadequate funds for advertising and outreach, causing low awareness among small businesses of the existence of PTACs. During interviews, the Section 809 Panel asked representatives from 14 small businesses in Silicon Valley if they knew about the existence of PTACs. None were familiar with the centers.

A DoDIG report from 1996 expressed concerns over PTAC roles. The report noted PTACs duplicate some roles of the SBA's SBDCs, primarily because of an expansion of PTAP's authorities in the FY 1994

[42] The Section 809 Panel met with the company in Seattle, WA, in March 2017; the company operates in the manufacturing industry, producing custom-designed components for machines, engines, etc.
[43] "About the PTAP and APTAC," Association of Procurement Technical Assistance Centers, accessed August 4, 2017, http://www.aptac-us.org/about-us/.
[44] Sherry Savage, Defense Logistics Agency, meeting with Section 809 Panel, July 10, 2017.
[45] Limitation, 10 U.S.C. § 2414.
[46] Cooperative Agreements, 10 U.S.C. § 2413.
[47] Rachel Fischer, San Diego Procurement Technical Assistance Center, meeting with Section 809 Panel, June 19, 2017.
[48] Ibid.

NDAA,[49] allowing PTAPs to provide assistance on contracts with other federal agencies, as well as state and local governments.[50]

Each PTAC is different due to the nature of its environment, local industries, and other factors. For instance, the technical competency of companies from rural, agricultural regions may be very different from those in urban areas.[51] PTACs must develop a unique approach to supporting small businesses within their areas of responsibility. As such, DLA includes in its assessment of PTACs their performance against three goals: the number of new clients, number of outreach events, and number of counseling hours.[52]

PTACs with limited staffs and high demand, like the one in San Diego, also struggle at times with backlog. For instance, in 2009 during the economic downturn, the San Diego PTAC faced a 12-week waiting period for small companies to get an appointment. Although the PTAC dealt successfully with the problem, the experience highlights the lack of integration among PTACs. Additionally, the PTACs lack a system, and sufficient visibility within DoD, necessary to help build DoD-wide awareness of small businesses' unique offerings and innovations.

Beyond PTAP, the Section 809 Panel was not able to identify a DoD-wide program or system designed to conduct outreach to bring small businesses into the defense market. Although DIUx represents a concerted effort to work more closely with small technology companies, it does not conduct broad outreach and technology scouting to discover new technologies and companies. Stated requirements from DoD customers, such as the Military Service branches, drive DIUx's process, which only solicits commercial solutions for DoD's known needs.[53] There are, however, isolated models within DoD that have demonstrated successes in conducting outreach, and DoD can look to other agencies for lessons on how to better reach small, nontraditional partners.

U.S. Special Operations Command (USSOCOM), in partnership with the Doolittle Institute, launched SOFWERX. SOFWERX aims to cultivate an ecosystem of innovative companies that can deliver solutions to the special operations community's unique challenges.[54] To do so, SOFWERX accepts unsolicited proposals, hosts challenges, and advertises widely across social media and through its university and industry partners. SOFWERX has facilities in which companies can collaborate, conduct rapid prototyping, and demonstrate capabilities.[55] To attract and leverage the ideas of young, innovative, and entrepreneurial people, the organization offers fellowships, summer camps, and college internships. USSOCOM reported that for a low cost, SOFWERX gives USSOCOM awareness to

[49] Office of the Inspector General, Department of Defense Procurement Technical Assistance Cooperative Agreement Program, accessed August 4, 2017, http://www.dodig.mil/audit/reports/fy97/97-007.pdf.
[50] Authority to Provide Certain Types of Technical Assistance, 10 U.S.C. § 2418.
[51] Sherry Savage, Defense Logistics Agency, meeting with Section 809 Panel, July 10, 2017.
[52] Ibid.
[53] "Work With Us," Defense Innovation Unit Experimental, accessed October 26, 2017, https://www.diux.mil/work-with-us/companies.
[54] SOFWERX, accessed October 26, 2017, http://www.sofwerx.org/. See also Defensewerx, accessed October 26, 2017, http://defensewerx.org/.
[55] "Frequently Asked Questions," SOFWERX, accessed October 26, 2017, http://www.sofwerx.org/faqs/.

unknown and emerging technologies, and is successfully cultivating partnerships with innovative small businesses to support warfighters.[56]

Part of SOFWERX's success may be attributable to the brand and public recognition of the special operations community. Similarly, the National Aeronautics and Space Administration's (NASA's) iTech program ascribes a portion of its success to NASA's globally recognizable brand. Small companies and innovators place great value on recognition from organizations with high visibility, like the U.S. Special Forces and NASA, because that recognition may attract venture capital investments for their companies or technology.[57]

Similar to SOFWERX, NASA's iTech program targets nonspace small startup companies, as well as universities and labs seeking to discover innovative technologies that can potentially solve critical challenges necessary for future space exploration. NASA iTech does not post specific requirements, but rather posts a broad topic of interest for a given challenge.[58] For example, iTech's third challenge cycle accepted white papers from potential participants on artificial intelligence, augmented reality, autonomy, high performance computing, and medical breakthroughs.[59] If applicants have a technology they believe NASA needs, but does not fit into one of the focus areas listed, NASA accepts white papers submitted under an undefined X Factor category.[60] NASA evaluates the white papers, and semifinalists have an opportunity to demonstrate their technology to all NASA chief technologists, venture capitalists, and representatives of large companies.[61] For little cost, iTech provides NASA an effective outreach capability and point of entry to identify groundbreaking technologies with both NASA mission-related and commercial viability.

### *Compliance-Related Requirements*

Based on data gathered from Section 809 Panel interviews with small companies, many that pursue business with DoD for the first time either are unaware of or underestimate the potential effects of audits, paperwork, and other processes on their companies' ability to operate. In one instance, a small business owner with whom the panel spoke shut down his business due to alleged delays and inappropriate application of accounting standards by the Defense Contract Audit Agency (DCAA), causing the company to lose a contract.[62] Although that company's experience may be an extreme case, the Section 809 Panel consistently heard that auditability requirements place undue burden on small companies. For example, the panel participated in a roundtable with four small businesses that had substantial experience operating in the aerospace and defense industries. Despite having experience in the defense market, all four companies expressed consistent struggles to meet DCAA requirements and cover audit-related costs.[63] Due to the complexity and depth of audit-related challenges, this report

[56] James Geurts, Special Operations Command, presentation to the Section 809 Panel, May 25, 2017.
[57] Kira Blackwell, NASA iTech, presentation to the Section 809 Panel, September 14, 2017.
[58] Ibid.
[59] NASA iTech, accessed October 26, 2017, https://nasaitech.com/#intro.
[60] Kira Blackwell, NASA iTech, presentation to the Section 809 Panel, September 14, 2017.
[61] Ibid.
[62] The company was based in the San Diego, CA, vicinity and had been in business for 16 years before ending operations.
[63] The roundtable took place in Seattle, WA, in March 2017. Though the companies all operated in aerospace and defense, each offered different products and services.

includes a separate section that explores the issue and offers recommendations on that topic (see Section 2).

In addition to challenges caused by audits, some companies, particularly those without prior experience in the defense or national security sectors, indicated they have difficulty obtaining security clearances. Valerie Muck, the Air Force's Director of Small Business Programs summarized small businesses' challenge with security clearances: "Small businesses cannot get a clearance without a contract, but cannot win a contract without having a clearance."[64] Failure to address such burdens on small businesses will continue to deter companies from entering the defense market and drive innovative companies out of the market.

### *Small Business Programs and Authorities Enabling Research and Development and Innovation*

The Section 809 Panel researched the SBIR and STTR programs, RIF, Mentor-Protégé Program, and consortia to assess their ability to help small businesses gain entry into the defense market.[65]

#### Small Business Innovation and Research Program and Small Business Technology Transfer Program

Congress created the SBIR and STTR programs in 1982 and 1992 respectively to encourage small businesses to contribute innovation to solve the nation's public policy challenges through federal research and development funding.[66] SBIR and STTR encourage domestic small businesses to engage in federal research/research and development (R/R&D) that has the potential for commercialization.[67] SBIR and STTR allow small businesses to profit from the commercialization of products developed through the program.[68] The SBIR and STTR programs have similar structures, but the STTR program requires the small business to collaborate with a research institution throughout the program.

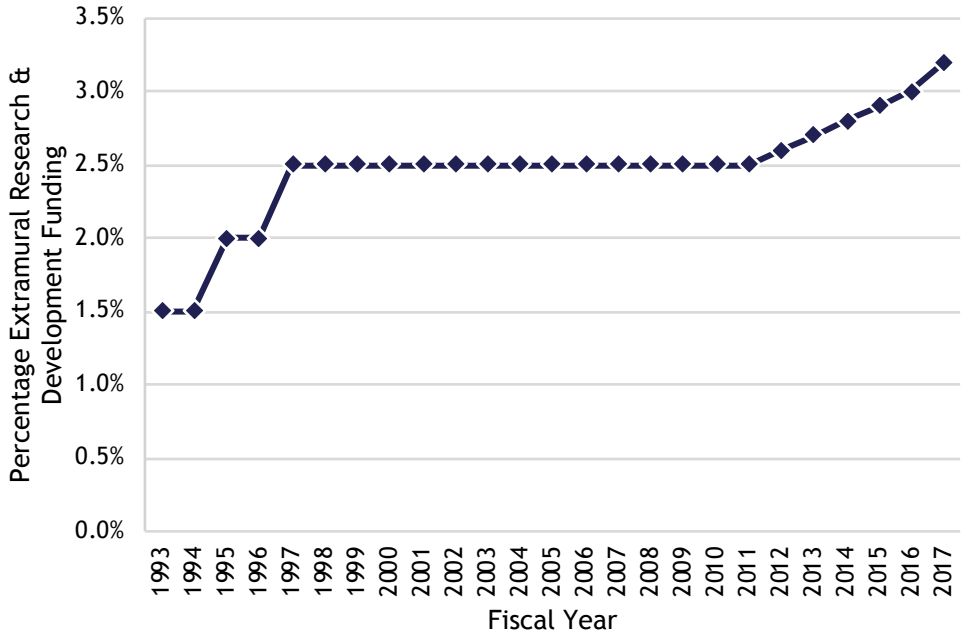
Past reports and performance evaluations indicate the SBIR program generates positive outcomes for participants and the government. The Government Accountability Office (GAO) found that agencies were funding high quality and innovative proposals through the program; indicating positive returns on investment for the agencies involved.[69] An analysis of employment and sales growth among 1,435 companies over a 10-year span indicated that companies participating in SBIR programs across the U.S. government, particularly companies in the high-tech sector located in areas with high volumes

[64] Valerie Muck, United States Air Force Office of Small Business Programs, meeting with Section 809 Panel, September 22, 2017.
[65] The Section 809 Panel also identified the Comprehensive Subcontracting Test Program as potentially effecting small businesses' access to the defense market. The Section 809 Panel intends to research the program more extensively as part of its research on subcontracting separately from this report.
[66] David Metzger, *While the Nation Slept: The Struggle of Small Innovative Businesses in the U.S.* (Herndon, VA: Mascot Books, 2016), 180.
[67] DoD tends to view commercialization differently than most other agencies administering an SBIR program. DoD typically defines commercialization as a product being acquired by a DoD entity; most other agencies define commercialization as a product being marketed and sold outside the government market.
[68] "About SBIR," U.S. Small Business Administration, accessed August 4, 2017, https://www.sbir.gov/about/about-sbir#embedded_flash_111707621.
[69] U.S. General Accounting Office, *Federal Research: Effectiveness of Small Business Innovation Research Program Procedures,* accessed August 4, 2017, http://www.gao.gov/assets/150/145342.pdf.

of private venture capital investment, were more likely to receive venture capital investments and grow in size than those companies that did not participate in SBIR.[70]

SBIR also offers a rather direct connection between innovative technology companies and the acquisition community. A survey conducted by the National Research Council revealed SBIR allows participants "direct access to DoD acquisition officers and other staff without the need to work through a prime contractor."[71] Statutory requirements for DoD to increase technology transition from SBIR into programs of record encourage connections between program participants and the acquisition community.[72] Small companies offering niche capabilities that may not attract venture capital funding can leverage SBIR's resources and support to improve their products and find potential DoD customers.[73]

**Figure 6-4. Minimum Expenditures Toward SBIR (By Fiscal Year)**




[70] Josh Lerner, "The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program," *The Journal of Business,* 72, no. 3, (1999): 285-318.
[71] Jacques Gansler, et al., *SBIR at the Department of Defense* (Washington, DC: The National Academies Press, 2014), 143-144.
[72] Goal for SBIR and STTR Technology Insertion, 15 U.S.C. § 638(y)(6).
[73] Jacques Gansler et al., *SBIR at the Department of Defense* (Washington, DC: The National Academies Press, 2014), 142.

SBIR's funding is currently set at 3.2 percent of DoD's extramural R&D funds.[74] The SBIR program has received incremental increases in its percentage allocation from DoD's extramural R&D funds since 2011.[75] STTR receives an allocation of just 0.45 percent of the extramural budget.[76] A study commissioned by the U.S. Air Force offers some insights into the SBIR and STTR programs' returns on investment. The study evaluated the economic effects of the U.S. Air Force's $4 billion investment into SBIR and STTR from 2000 to 2013, and indicated that the service's SBIR and STTR investments yielded $47.9 billion in economic output nationwide.[77] The benefits of the SBIR and STTR programs have led to calls for them to become permanent. Currently, the programs' reauthorization requires periodic renewal, with the risk of not being reauthorized.[78] Several experts in acquisition and small business innovation advocate for the permanent authorization of SBIR and STTR. Jacques Gansler, a scholar and former USD(AT&L), stated in a 2015 Senate Small Business Committee hearing that it is time for the programs to become permanent.[79] During this hearing, the committee asked other outside expert acquisition witnesses if there were any possible objections to making SBIR and STTR permanent; none were given.[80] Other small business and innovation experts have called for the programs to be improved and made permanent.[81]

Although the SBIR program is lauded as being successful, the program has some limitations. Of greatest concern to the Section 809 Panel is that the SBIR program lacks speed, agility, and flexibility. The program's processes are increasingly onerous.[82] Companies, program experts, and prior studies indicate the topics, time to Phase III, contracting process, and audits undermine the program's innovative potential.[83] Many companies struggle to transition to Phase III of DoD's SBIR program and see their technologies inserted into DoD programs of record.[84]

Numerous small companies shared concern about DoD's SBIR topics. Representatives from one San Diego-based company noted that the only SBIR topics for which their organization had received an award were the topics the company wrote themselves and provided to the DoD program managers for

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[74] Required Expenditure Amounts, 15 U.S.C. § 638(f)(1).
[75] Ibid.
[76] Given the relatively small size of the STTR program compared to SBIR, the Section 809 Panel put greater emphasis on researching opportunities to improve the SBIR program as a means to reduce barriers to entry for small businesses and better work with the small business community to support DoD's mission.
[77] United States Air Force, *The Air Force Impact to the Economy via SBIR/STTR*, accessed October 30, 2017, https://www.sbir.gov/sites/default/files/USAF%20SBIR-STTR%20Economic%20Impact%20Study%20FY2015.pdf.
[78] SBIR and STTR must be reauthorized by September 30, 2022 under Section 1834 of the FY 2017 NDAA.
[79] Jacques Gansler, *Acquisition Reform: Next Steps*, testimony before United States Senate Committee on Armed Services, December 1, 2015.
[80] Ibid.
[81] David Metzger, *While the Nation Slept: The Struggle of Small Innovative Businesses in the U.S.* (Herndon, VA: Mascot Books, 2016), 279-282.
[82] Small Business Technology Council, *Small Business Innovation Research (SBIR): Leveraging American Business Growth and Jobs, SBIR: Entrepreneur-Driven R&D to Support American Economic Revitalization*, 2017, accessed November 20, 2017, http://sbtc.org/wp-content/uploads/2017/01/SBTC-SBIR-White-Paper-2017.pdf.
[83] Jacques Gansler et al., *SBIR at the Department of Defense* (Washington, DC: The National Academies Press, 2014). For further information on SBIR topics and program phases, see "About SBIR," U.S. Small Business Administration, accessed November 30, 2017, https://www.sbir.gov/about/about-sbir#sbir-three-phase-program.
[84] Ibid, 220. The report notes improvements have been made in helping small companies reach Phase III, but also notes a number of ways in which DoD can improve Phase III transition.

inclusion in a broad agency announcement (BAA). Topics often are prescriptive, outlining specific requirements and thus creating barriers for innovative companies trying to participate in SBIR. Transitioning away from requirements-based topics to problem statements or theme-based topics may help alleviate this issue. The National Science Foundation (NSF) may serve as a model for such an approach. NSF's SBIR topics are thematic in nature; posting broad needs and interests encourages many companies with different capabilities and ideas to generate SBIR proposals.

Awarding a Phase I contract often takes at least a year.[85] The speed at which technologies mature in DoD's SBIR program simply does not happen quickly enough; DoD SBIR technologies take 8 to 12 years to reach commercialization.[86] The rate of technological advancement far outpaces the speed of DoD's SBIR program, potentially causing DoD to acquire already outdated or suboptimal technologies through SBIR Phase III.[87] Other agencies have struggled with lack of speed in the SBIR program in the past, and have found success in accelerating their programs through rather modest initiatives. For example, the NSF adopted the Lean LaunchPad methodology[88] for its Innovation Corps (I-Corps) program. In an effort to improve the pace and effect of its SBIR program, NSF also established an I-Corps boot camp program that exposes all SBIR grantees and their program officers to the Lean LaunchPad process.[89]

A master release schedule, which SBA manages,[90] determines when DoD can make SBIR awards.[91] This approach constrains DoD from awarding SBIR contracts in response to unsolicited proposals. DoD also awards all of its SBIR funds using contracts. Federal regulations require that DoD grants officers make a determination as to whether the proposed activity is for a *public purpose* or is in support of DoD's mission.[92] The SBIR program supports research that meets both criteria and could be grant funded. Even though other federal agencies fund SBIR projects through grants, as well as contracts, current regulations that apply only to DoD restrict DoD's options for funding companies' innovation- and research-related efforts through SBIR.

Relative to grant and cooperative agreement funding, FAR-based contracts are more complex, and SBIR participants and DoD officials have difficulty with contracting and FAR-based requirements

[85] David Sikora, Acting DoD SBIR/STTR Program Administrator, meeting with Section 809 Panel, May 4, 2017.
[86] Ibid.
[87] Ample research exists demonstrating the rate of technological change happens exponentially. For example, Moore's Law projected that computing power would double approximately every 2 years (see: Gordon E. Moore, "Cramming More Components onto Integrated Circuits," *Electronics*, April 19, 1965). Ray Kurzweil's Law of Accelerating Returns further indicates technological change happens exponentially, and the rate of technological advancement is consistently increasing (see Ray Kurzweil, *The Law of Accelerating Returns,* accessed August 4, 2017, http://www.kurzweilai.net/the-law-of-accelerating-returns).
[88] The Lean Launchpad methodology, pioneered by Steve Blank, consists of three elements: (1) Companies or organizations develop a one-page business or mission model canvas, which outlines core assumptions and hypotheses about a product to be developed and its end-users; (2) Companies or organizations gather data from potential end-users to ensure the product to be developed is solving actionable problems, rather than meeting prescriptive requirements; and (3) Agile development of the product allows for incremental testing and iterative feedback by and from the anticipated end-users.
[89] Errol Arkilic, former Innovation Corps Program Director, phone call with Section 809 Panel, June 28, 2017.
[90] Assistance to Small-Business Concerns, 15 U.S.C. § 638(b)(5).
[91] David Sikora, Acting DoD SBIR/STTR Program Administrator, meeting with Section 809 Panel, May 4, 2017.
[92] Distinguishing Assistance from Procurement, 32 CFR § 22.205.

applicable to the SBIR program.[93] Small businesses also struggle to overcome the delays and costs inherent in DoD's contracting process and acquisition regulations,[94] which introduces difficulties and delays that can otherwise be avoided.[95] At a 2016 hearing on the SBIR program, a Navy senior official testified,

> *Our challenge…[is] the FAR and DFAR. When my SBIR companies have to comply with the same regulations, procedures, and processes that we expect of our defense primes, it is very difficult if it is two people in a garage.*[96]

Leveraging grants and cooperative agreements for Phases I and II, as is done by other SBIR administering agencies, could offer benefits in terms of speed and program flexibility. Grants and cooperative agreements require less preaward effort than contracts and facilitate awarding contracts faster.

By statute, companies can receive only one additional Phase II SBIR award for a given project, which further limits the flexibility of SBIR to support small companies and promote innovation.[97] New companies that may have more innovative, high-quality proposals, but also are in need of more capital to bridge the *valley of death*[98] are restricted to the same number of Phase II awards for a project as companies with prior SBIR experience. This situation limits DoD's ability to lend greater support to small businesses new to SBIR compared to companies that already understand SBIR and likely have greater knowledge of how to successfully commercialize their technologies.

Another challenge for small companies is the required audit of the firm's accounting systems and procedures. DCAA performs this function for DoD SBIR participants. According to DCAA, SBIR small businesses potentially are subject to two audits: a preaward audit of the financial system and a postaward audit of the contract.[99] During a roundtable held by the Section 809 Panel, Army contracting officers identified the requirements for DCAA audits and the onerous contracting process as a substantial impediment to SBIR participants.[100] Audit compliance, (see Section 2), is often burdensome and costly, especially for small businesses. DoD is by far the largest SBIR agency in terms of dollars and has the highest number of awardees. DCAA conducts many audits each year, especially if the awardees are new. Delays and backlogs can range from 6 months to more than a year.[101] These timelines,

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[93] National Research Council, Charles Wessner, ed., *Committee for Capitalizing on Science, Technology, and Innovation: An Assessment of the Small Business Innovation Research Program* (Washington, DC: National Academies Press, 2009), 25, 194, 201, 210.
[94] Ibid, 20.
[95] Ibid, 201.
[96] Robert Smith, *Commercializing on Innovation: Reauthorizing the Small Business Innovation Research and Small Business Technology Transfer Program*, testimony before United States House of Representatives Committee on Small Business, March 2, 2016.
[97] Express Authority for Awarding a Sequential Phase II Award, 15 U.S.C. § 638(ff)(1).
[98] The *valley of death* is a commonly used term in the technology and start-up industries. The term refers to the period of time between when a company first receives money to support research and development, to when the product becomes commercialized and generates steady revenue.
[99] Defense Contract Audit Agency, *Resource Guide for the Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs*, accessed August 4, 2017, http://www.acq.osd.mil/osbp/sbir/sb/resources/index.shtml.
[100] U.S. Army contracting officers, meeting with the Section 809 Panel, November 2016.
[101] National Research Council, Charles Wessner, ed., *Committee for Capitalizing on Science, Technology, and Innovation: An Assessment of the Small Business Innovation Research Program* (Washington, DC: National Academies Press, 2009), 201.

although normal for larger contractors, can introduce additional cost and risk analysis on potential SBIR firms.

Efforts to improve commercialization rates and processes date back to 1992;[102] nevertheless, problems remain. Federal agencies are required by statute to issue Phase III (commercialization) awards "to the greatest extent practicable."[103] Research indicates there is uneven emphasis on Phase III awards across DoD, with the Navy being a notable exception, accounting for 70 percent of all DoD Phase III awards.[104] Due to inadequate resources dedicated to Phase III, DoD struggles to help SBIR companies reach commercialization.[105] Given that Phase III resources are limited, and that the program receives funds by taking money from extramural R&D accounts, managers often view SBIR as a tax on their programs.[106] The fact that SBIR does not factor prominently in acquisition strategies and programs may also inhibit commercialization. The only reference to SBIR in DoDI 5000.02 is a single bullet point requiring program managers to "establish goals" for applying SBIR technologies in programs of record.[107]

### Rapid Innovation Fund

The RIF was created in 2011.[108] In FY 2016, the program was appropriated $250 million.[109] DoD OSBP and ASD(R&E) Emerging Capability and Prototyping (EC&P) manage the RIF program jointly with funding administered by OSBP.[110] After appropriations, Congress disburses program funds to DoD OSBP, which allocates a portion of the RIF funds to each of the Military Services and retains a portion used for projects proposed by the Defense Agencies and Combatant Commands.[111] The Services select and manage their RIF projects, and OSBP and EC&P jointly select projects that defense agencies and combatant commands manage.[112] OSBP, as the program element manager, funds all RIF projects.[113]

RIF awards cannot exceed $3 million.[114] For RIF, BAAs solicit white papers and initiate a competitive selection process.[115] Small businesses receive preference; as of FY 2016, 88 percent of all RIF awards

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[102] Jacques Gansler, et al., *SBIR at the Department of Defense* (Washington, DC: The National Academies Press, 2014), 96-97.
[103] Phase III Awards, 15 U.S.C. § 638(r)(4).
[104] National Research Council, Charles Wessner, ed., *Committee for Capitalizing on Science, Technology, and Innovation: An Assessment of the Small Business Innovation Research Program* (Washington, DC: National Academies Press, 2009), 29.
[105] Jacques Gansler et al., *SBIR at the Department of Defense* (Washington, DC: The National Academies Press, 2014), 167.
[106] David Sikora, Acting DoD SBIR/STTR Program Administrator, meeting with Section 809 Panel, May 4, 2017. Jacques Gansler et al., *SBIR at the Department of Defense* (Washington, DC: The National Academies Press, 2014), 167, 211, 221.
[107] Operation of the Defense Acquisition System, DoDI 5000.02, Enclosure 1, 48 (2015).
[108] FY 2011 NDAA, Pub. L. No. 111-383, 124 Stat. 4137 (2011).
[109] Ellen Purdy and Ted Bujewski, *Rapid Innovation Fund (RIF): Program Overview*, accessed August 4, 2017, http://business.defense.gov/Portals/57/Documents/RIF_Overview-Feb2017.pdf.
[110] Ted Bujewski, DoD Office of Small Business Programs, email to Section 809 Panel, October 12, 2017.
[111] Ibid.
[112] Ibid. Memorandum from Office of the Undersecretary of Defense, Acquisition, Technology, and Logistics, *Announcement of Implementation Guidelines and Use of Technology Transition Best Practices for Components Planning to Participate in the Rapid Innovation Fund (RIF) Program for Fiscal Year 2017,* April 11, 2017.
[113] Ibid.
[114] Science and technology programs to be conducted so as to foster the transition of science and technology to higher levels of research, development, test, and evaluation, 10 U.S.C. § 2359.
[115] Ellen Purdy and Ted Bujewski, *Rapid Innovation Fund (RIF): Program Overview*, accessed August 4, 2017, http://business.defense.gov/Portals/57/Documents/RIF_Overview-Feb2017.pdf.

have gone to small businesses.[116] A large business can receive a RIF award if a small business cannot produce a mature prototype.[117]

RIF is a useful tool for enabling acquisition and integration of innovative capabilities developed by small businesses. For example, RIF provides fiscal resources to help DoD transition SBIR technologies from Phase II into Phase III; approximately 60 percent of RIF technologies are developed through SBIR.[118] RIF, however, is constrained by inflexibility. The program only posts BAAs once per year on FedBizOpps, the main source for businesses to find opportunities to contract with the federal government. Because the statute requires a competitive selection process for RIF awards,[119] unsolicited proposals for technologies may not receive a RIF contract outside the BAA cycle. It is unclear whether the SBIR process qualifies as a competitive process for RIF awards,[120] despite the statute allowing sole source Phase III awards for SBIR technologies.[121]

Survey feedback, as reported by DoD's OSBP, indicated more than 90 percent of RIF awardees stated that RIF helped their businesses, and 57 percent reported RIF succeeded in helping transition technology.[122] Given requirements to compete RIF awards, however, the process is slower than intended. One small company shared with the Section 809 Panel that it took nearly 2 years from a white paper through the proposal process to get on a RIF contract, concluding, "The Rapid Innovation Fund wasn't rapid at all."[123] A 2015 U.S. GAO report expressed similar concerns and indicated the process for awarding RIF contracts takes approximately 18 months.[124] The program's speed suffers, at least in part, from lack of dedicated contracting offices and infrastructure.[125] Executing a RIF contract, especially for organizations like combatant commands and defense agencies without contracting offices of their own, typically requires searching for a contracting office with the bandwidth and willingness to take on the work.[126]

The $3 million cap on RIF project funding (unless the Secretary of Defense or the Secretary's designee approves greater funding)[127] does not ensure the program can help small companies navigate past the *valley of death* and transition their technologies into programs of record. The same company that

[116] Ibid.
[117] Ted Bujewski, DoD Office of Small Business Programs, meeting with Section 809 Panel, May 19, 2017.
[118] Ibid.
[119] Science and technology programs to be conducted so as to foster the transition of science and technology to higher levels of research, development, test, and evaluation, 10 U.S.C. § 2359.
[120] Ibid.
[121] Ibid.
[122] Ellen Purdy and Ted Bujewski, *Rapid Innovation Fund (RIF): Program Overview*, accessed August 4, 2017, http://business.defense.gov/Portals/57/Documents/RIF_Overview-Feb2017.pdf.
[123] Eric Patten, Ocean Aero, presentation to Section 809 Panel, June 21, 2017.
[124] GAO, *DoD Rapid Innovation Program: Some Technologies Have Transitioned to Military Users, but Steps Can Be Taken to Improve Program Metric and Outcome,* accessed August 5, 2017, http://www.gao.gov/assets/680/670090.pdf.
[125] Ted Bujewski, DoD Office of Small Business Programs, phone call with Section 809 Panel staff, September 29, 2017.
[126] Ibid.
[127] Science and technology programs to be conducted so as to foster the transition of science and technology to higher levels of research, development, test, and evaluation, 10 U.S.C. § 2359.

pointed to slowness in the program indicated $3 million is insufficient to develop the contracted platform. As a result, the company is taking a loss on the project.[128]

### Mentor-Protégé Program

The Mentor–Protégé Program facilitates partnerships between small and large businesses, with the goal of leveraging large businesses' resources and expertise to help small companies win defense contracts and promote technology transfer.[129] DoD is not the only agency to administer a mentor–protégé program (although DoD's program is agency-specific, whereas other such programs across the federal government fall under the SBA's purview).[130]

Small business protégés with which the Section 809 Panel spoke, indicated that mentors occasionally pressure small business protégés to transfer their rights to intellectual property to the mentors. Because neither DoD nor SBA has tangible data on the program, however, the Section 809 Panel did not identify any compelling findings on the program's efficacy. Based on interviews with DoD's OSBP, efforts are underway to change the Mentor-Protégé Program's data collection and reporting requirements.[131]

### Consortia and Accelerators

Consortia and accelerators (referred to as consortia here) are effective resources for DoD to access small business innovations and technologies. Consortia pool companies with specific technical capabilities and service offerings, effectively building a community of companies that can collaborate and compete with one another to deliver better products and services to DoD. Such organizations can tap into their communities to help connect small businesses with DoD, especially organizations executing other transaction authorities (OTAs) for R&D and prototyping, allowing DoD to quickly make awards to small businesses offering innovative capabilities and technologies.[132]

For instance, NSTXL helps small businesses pursue, win, and receive awards via OTAs within 80 to 100 days.[133] DIUx employs a similar approach to getting companies awards via OTAs.[134] The speed at which consortia can help DoD administer OTAs to acquire innovative capabilities and technologies meets the needs of small companies for DoD acquisitions to move more quickly, and is an important tool for enhancing DoD's warfighting capabilities.

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[128] Eric Patten, Ocean Aero, presentation to Section 809 Panel, June 21, 2017.
[129] "Mentor-Protégé Program (MPP)," U.S. Department of Defense Office of Small Business Programs, accessed August 5, 2017, http://www.acq.osd.mil/osbp/sb/programs/mpp/. Robert Stewart, *DOD Mentor Protégé Program*, accessed August 5, 2017, http://www.acq.osd.mil/osbp/docs/DoD-MPP_FY16_SlideDeck-15DEC15.pdf.
[130] Robert J. Dilger and Kate M. Manuel, *Small Business-Protégé Programs,* accessed August 5, 2017, https://fas.org/sgp/crs/misc/R41722.pdf.
[131] Alice Williams, Acting Deputy Director of DoD Office of Small Business Programs, meeting with Section 809 Panel, May 4, 2017
[132] OTAs are established in 10 U.S.C. § 2371 and give DoD the authority to enter into agreements other than contracts, grants, or cooperative agreements. OTAs are not covered by the FAR, and are intended for use on basic, applied, advance research and prototyping projects. The Section 809 Panel found that OTAs are of increased interest to DoD and an important vehicle for companies to deliver innovative products and services to the Department. The Section 809 Panel continues to research OTAs and may offer findings and recommendations in a later report.
[133] Tim Greeff, NSTXL, presentation to Section 809 Panel, April 25, 2017.
[134] Michael Bold, *Speed Contracting,* accessed August 5, 2017, https://www.army.mil/article/178968/speed_contracting.

Consortium managers have no incentives to search for new technologies and recruit new members into the community. Consortium managers search for technologies within the consortia in response to a specific DoD requirement, but consortia managers do not typically provide technology-scouting support to DoD.[135] Because consortium managers may not proactively identify new technologies for DoD application, finding new technologies by way of consortium managers is not consistent and may cause innovative technologies to remain unknown to, or overlooked by, DoD.

Some stakeholders the Section 809 Panel met with expressed concern that leveraging consortia to execute OTAs is creating a pay-to-play system in which small companies looking to do business with DoD through OTAs must pay consortium membership fees.[136] The panel noted, however, that consortium membership fees often are minimal, no more than a few hundred dollars per year.[137] Absent alternative revenue sources, membership fees and transaction administration fees are necessary to fund consortium operations.[138] Although this funding approach may not present a substantial barrier today, the situation may require future consideration if fees become a major barrier for businesses looking to enter the defense market.

## Conclusions

Small business policy objectives and programs, as executed today, do not emphasize promoting small businesses that directly enable DoD to better execute its missions. The pressures that DoD faces, and will increasingly face, to execute its mission necessitate a clear-minded focus on leveraging small businesses to maximize warfighting effectiveness. DoD should refocus its small business policies, programs, and practices to maximize warfighting capabilities and capacities. A number of issues need resolution for DoD to work more effectively with small businesses:

- Greater unity of effort is necessary to direct and align DoD's small business policy, programs, and strategy with DoD's mission. DoD lacks the infrastructure and connectivity between the small business community and industrial base policy to align small business programs with the DoD's strategic needs. Regardless of the ultimate outcome of the current reorganization, it is important to increase the connectedness of DASD(MIBP), OSBP, and PTAP to develop a complete view of the defense market, support innovative small businesses, and leverage small businesses to meet the DoD's mission-related needs.

- DoD must better support small businesses, and in doing so, it should prioritize working with innovative small businesses that can directly enhance mission capabilities. DoD needs to articulate a strategy and implementation policy for how it will leverage the innovative capacity and potential of the small business community to meet critical, mission-related needs. DoD's small business professionals at the field-level are not focused on finding innovative small companies with offerings that can enhance DoD's warfighting capabilities and capacities. DoD should repurpose its small business assets to find and connect innovative small businesses with contract opportunities supporting DoD's strategic needs.

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[135] Chris Van Metre, Advanced Technology International, phone call with Section 809 Panel, May 11, 2017.
[136] Meagan Metzger, Dcode42, presentation to the Section 809 Panel, April 25, 2017.
[137] Chris Van Metre, Advanced Technology International, phone call with Section 809 Panel, May 11, 2017.
[138] Ibid.

- Small businesses seeking entry into the defense market need better communication and clearer points of entry. Small companies require coaching, support, and feedback to enable their growth, development, and success in supporting DoD. PTAP could help address the need for greater and more effective communication with small businesses; however, PTAP is not exclusively DoD-focused, lacks sufficient resources, and struggles to reach small businesses that may be interested in the defense market. In addition to increasing small businesses' awareness of PTACs and PTACs' capacities to help small businesses across the country, DoD needs to align PTAC goals and operations with DoD's strategic needs and priorities. Open innovation centers like SOFWERX present another viable approach because they could offer a low-cost, yet effective method of attracting innovators into the defense market. DoD should use such centers more widely to provide entry points and host challenges (like those put on by both SOFWERX and NASA iTech) to leverage small, innovative companies to solve unique DoD problems. The mentor–protégé program also helps small businesses grow and mature. To allow for detailed reviews and studies of the program in the future, DoD should continue to improve data collection and reporting should continue.

- DoD should invest more heavily in SBIR and RIF, as both effectively leverage small businesses to further DoD's mission-related capabilities; however, both programs could benefit from greater speed and flexibility. DoD should factor SBIR technologies more explicitly into its acquisition strategies and plans. Greater speed, as well as the ability to disburse large awards under both programs, will help companies bridge the *valley of death* and successfully commercialize their products.

- Consortia and technology accelerators can help DoD gain greater awareness of emerging technologies and quickly connect small businesses to DoD customers. Consortia need to provide greater technology scouting support and services to DoD to maximize their effect. Consortium fees need to remain affordable for small companies to prevent emergence of additional barriers to entry into the defense market.

## Implementation

### *Legislative Branch*

- Enact a Defense Small Business Act, consolidating all statutes pertaining to DoD's small business programs under Title 10.

### *Executive Branch*

- Introduce policy directing a refocus to working with small businesses to support and enhance DoD's warfighting capabilities and capacities.

### *Subrecommendation 21a: Establish the infrastructure necessary to create and execute a DoD small business strategy, ensuring alignment of DoD's small business programs with the agency's critical needs.*

#### *Legislative Branch*

- Introduce a requirement for DoD to develop a small business strategy within 180 days of enactment, to include the following provisions:
  - Integration of small business into a holistic view of industry;
  - Alignment of DoD small business programs with agency mission; and
  - Clarifying points of entry into the defense market, including enabling and promoting the PTAP to facilitate small business entry into the defense market.
- Amend 10 U.S.C. § 2504 to require DoD to include the following in its annual report to Congress on the defense base:
  - An analysis of capabilities and emerging technologies relevant to DoD's warfighting mission across the small business community and among non-traditional partners.
  - How DoD will incorporate small business goals and strategies into the greater industrial base strategy.
  - How relevant offices are integrating small business activities into a greater industrial base strategy.
- Amend Chapter 142 of 10 U.S.C. to provide PTACs the flexibility and resources necessary to conduct greater outreach and provide greater support to small businesses by: increasing funding of PTACs to cover all operational costs up to a cap that is double what can currently be allocated to each individual PTAC and eliminating the requirement for PTACs to secure matching funds.
- Increase the annual appropriation made to the Procurement Technical Assistance Cooperative Agreement Program to no less than $68 million.
- Encourage small DoD contractors to grow and mature their capabilities by allowing small businesses that grow beyond their size thresholds to retain their status as a small business and/or 8(a) for 3 years unless a large company acquires the small businesses.

#### *Executive Branch*

- No Executive Branch changes are required.

## *Subrecommendation 21b: Build on the successes of the SBIR/STTR and RIF programs.*

### *Legislative Branch*

- Amend 15 U.S.C. § 638 to make SBIR and STTR permanent.
- Amend 10 U.S.C., in recognition of the success of the SBIR program, to increase DoD's percentage allocation of extramural R&D funds allocated to SBIR to 7 percent, phased in during 5 years.
- Amend 10 U.S.C. to authorize DoD SBIR Phase I awards of $500,000 and Phase II awards of $1.5 million.
- Amend 10 U.S.C. to allow explicitly the application of simplified acquisition procedures to SBIR Phases I and II, while ensuring SBIR intellectual property protections remain.
- Amend 10 U.S.C. to allow DoD to issue sole-source SBIR Phase I and Phase II awards outside the master release schedule and to nonconforming proposals, not requiring a Justification and Approval (J&A), and not subject to protest.
- Amend 10 U.S.C. to allow for DoD SBIR Phase II awards without regard for whether a small business received a Phase I award.
- Amend U.S.C. Title 10 to ensure small business concerns participating in the SBIR program for the first time may receive more than two Phase II awards.
- Amend U.S.C. Title 10 to allow for the use of grants, cooperative agreements, and other transaction authority for SBIR and STTR.
- Amend 10 U.S.C. § 2359 to explicitly allow SBIR and STTR technologies entering into Phase III to be eligible for sole-source RIF awards, not requiring a J&A, and not subject to protest.
- Increase the annual appropriation to RIF to $750 million.
- Amend 10 U.S.C. § 2359 to eliminate the $3 million spending cap per RIF award, and allow agencies to issue sole-source RIF awards to unsolicited proposals deemed critical for enhancing DoD's warfighting capabilities and capacities.

### *Executive Branch*

- Update DoD policy on major weapons system programs to emphasize SBIR technologies as essential components of acquisition strategies and plans.
- Change DoD policy to disburse a share of RIF money to the defense agencies, USSOCOM, U.S. Transportation Command, and any Combatant Command granted contracting authority; give those entities the ability to select and manage RIF projects.

- Create a specific exemption for the SBIR and STTR programs within Title 32 CFR § 22.205, and exempt SBIR and STTR funding agreements from Title 32 CFR § 22.205b and § 34.18.

### *Subrecommendation 21c: Enable innovation in the acquisition system and among industry partners.*

#### *Legislative Branch*

- Authorize through legislation a DoD Nontraditional Technology Partner Initiative to incentivize outreach and working with nontraditional partners through the following:
  - Awards (to include cash prizes) to DoD civilians and uniformed personnel for efforts to leverage nontraditional partners for the delivery and/or development of new technologies directly enhancing warfighting capabilities.
  - Cash or noncash awards to DoD contractors for the identification of and subcontracting with nontraditional partners offering new technologies to DoD.
  - Cash or noncash awards to consortia that successfully assist non-traditional partners in obtaining DoD contracts (to include other transactions) for the first time.
- Direct the establishment of a Defense Innovation Center Program, expanding the use of robust open innovation centers, like SOFWERX, across DoD, the Services, and organizations. Under the program, DoD should do the following:
  - Identify DoD components with sufficient public recognition under which open innovation centers can be established.
  - Budget for the establishment and operation of open innovation centers in regions enabling small, innovative companies to interact directly with DoD end-users and operators.
  - Give sponsoring organizations under which the centers are established authority and necessary resources to execute business arrangements, to include OTAs and grants, and host challenges.

#### *Executive Branch*

- No Executive Branch changes are required.

#### *Implications for Other Agencies*

- Because SBA oversees governmentwide small business activities, changes to DoD's small business activities and programs may affect SBA's oversight of DoD's programs. Some recommendations made by the Section 809 Panel may require coordination between SBA and DoD to implement.