

SMALL BUSINESSES IN SPACE: UPDATES TO SPACE-RELATED SMALL BUSINESS PROCUREMENT IN LIGHT OF THE SPACE FORCE’S PROPOSED ACQUISITION FRAMEWORK

Jonathan C. Clark\*

TABLE OF CONTENTS

I. Introduction .....249

    A. The USSF Acquisition Framework .....249

    B. New Space v. Old Space Procurement.....250

    C. A New Era in Space Procurement: New Space and the Acquisition of Commercial Space Technologies .....251

II. What’s the Big Deal About Small Businesses? .....251

    A. What Does the USG Have to Do with Small Business?.....251

    B. What Benefit Does the USG Get by Helping Small Businesses? .....252

    C. What’s Standing in the Way of Helping Small Businesses? .....254

    D. Growth Potential and Technical Capabilities—Space Small Businesses Still Need Help from USG to Grow and Scale.....255

III. The USSF’s Current Efforts to Involve Small Businesses.....255

IV. Small Businesses Will Not or Cannot Work with the DoD Space Procuring Agencies .....257

    A. General Small Business Problems Working with the USG .....257

    B. Space Small Business Procurement Issues .....258

        1. Space Technologies Are Expensive to Develop .....258

        2. Space Procurements May Require Access to Launch Capabilities .....260

        3. Space Is Highly Regulated, and Compliance Is Costly .....260

        4. Commercialization of Space Technology Is Difficult.....261

V. Using Current Small Business Set-Aside Programs for Short-Term Growth .....261

    A. SBIR/STTR Programs.....262

---

*\* Jonathan C. Clark (jonathan\_clark@law.gwu.edu) is a third-year law student at The George Washington University Law School (degree anticipated May 2023), pursuing a concentration in government procurement law. He is the Murray J. Schooner Procurement Law Scholar for the 2022–2023 academic year and a Senior Managing Editor of the Public Contract Law Journal.*

---

- 1. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs.....262
- 2. Changes to SBIR/STTR in the Space Acquisition Framework.....263
  - i. Increase Funding and Limits.....263
  - ii. Guaranteed Phase III Support .....264
  - iii. Leverage the Mentor-Protégé Program.....264
- B. Mentor-Protégé Program .....265
  - 1. The DoD’s Mentor-Protégé Program .....265
  - 2. Potential Benefits to Using MPPs for Space Procurement....266
  - 3. DoD’s MPP Is Underutilized and Ill-Suited for Space Procurement .....267
  - 4. Changes to the Mentor-Protégé Program in the Space Acquisition Framework .....269
- VI. Redefining Success: Helping Small Businesses Succeed in New Space.....270
  - A. Dollar Spend and Proportion of Contracts in New Space Procurement.....270
  - B. Redefining Success: FAR.....272
  - C. Redefining Success: SBIR/STTR.....273
  - D. Redefining Success: The DoD’s Mentor-Protégé Program.....274
- VII. Conclusion .....275

ABSTRACT

The United States Space Force (USSF) is in the process of creating and implementing a new acquisition framework. Space procurement, once dominated by massive contracts and multi-billion-dollar awards, has started to see a shift. Space procurements present unique challenges for small businesses. Not only do space technologies cost more money to develop and test, but they also often require access to various capabilities unique to space programs. Space is highly regulated, and compliance can be expensive. Additionally, and most importantly, space technology developed by small businesses is often hard to scale and bring to the commercial market.

To help alleviate these problems, this Note advocates for the USSF to modernize and adapt three small business programs: the Small Business Innovation Research (SBIR) program; the Small Business Technology Transfer (STTR) program; and the Department of Defense’s (DoD) Mentor Protégé Program (MPP). This Note also argues that the USSF must make changes in light of the “New Space” age as commercial activities continue to expand in space.

The commercial space age has brought an influx of new money, new actors, and new products and services to the space industry. One of the primary goals of the USSF acquisition system should be to leverage these commercial solutions to meet defense needs. As the USSF starts to make use of these commercial products and services, it should consider and be careful not to exclude small

businesses, as research shows that space-related small businesses disproportionately rely on government research and development (R&D) funding to develop their space technology and bring it to market. If the USSF starts spending less money on R&D, small businesses will require support in other ways.

## I. INTRODUCTION

Countless generations of stargazers have looked to the sky and thought about what it would be like to traverse the stars. Until the 1950s and early 1960s, such journeys existed only in dreams. However, humanity's journey into the stars created a unique set of national security concerns which required consideration of the vast reaches outside of Earth's atmosphere as a potential threat and eventual warzone.<sup>1</sup> In 2001, the Commission to Assess United States National Security Space Management and Organization urged that "[i]f the U.S. is to avoid a 'Space Pearl Harbor' it needs to take seriously the possibility of an attack on U.S. space systems."<sup>2</sup> Legislators have recognized space as "an environment where potential adversaries are becoming more active and capable."<sup>3</sup> And this focus on space as a warfighting domain led to the creation of the United States Space Force (USSF) on December 20, 2019.<sup>4</sup>

### A. The USSF Acquisition Framework

The creation of a new military service presents a unique opportunity to rethink our approach to military procurement for outer space.<sup>5</sup> The United States Department of the Air Force (DAF)<sup>6</sup> recognized this opportunity and tasked the RAND Corporation with developing a clean-sheet approach to space procurement.<sup>7</sup> RAND found that "to maintain an[] advantage over potential adversaries in space . . . DoD [must] draw on the *commercial space industry*, particularly nontraditional suppliers, such as *small startups*, which lead the way in technological innovation."<sup>8</sup> Unfortunately, the DAF and RAND did not address a critical problem: space small businesses rely on United States Government (USG)

1. Erik M. Conway, *From Rockets to Spacecraft: Making JPL a Place for Planetary Science*, 70(4) *ENG'G & SCI.* 2, 79 (2007).

2. COMM'N TO ASSESS UNITED STATES NAT'L SEC. SPACE MGMT. & ORG., REPORT OF THE COMMISSION TO ASSESS UNITED STATES NATIONAL SECURITY SPACE MANAGEMENT AND ORGANIZATION viii–ix (2001).

3. WILLIAM SHELTON ET AL., RAND CORP., A CLEAN SHEET APPROACH TO SPACE ACQUISITION IN LIGHT OF THE NEW SPACE FORCE 1 (2021).

4. National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92, subtit. D (2019); 10 U.S.C. § 9081.

5. SHELTON ET AL., *supra* note 3, at 1.

6. Most of the early USSF components were derived from existing DAF commands. See National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92, subtit. D, § 952(a) (2019) ("The Air Force Space Command is hereby redesignated as the United States Space Force").

7. SHELTON ET AL., *supra* note 3, at iii.

8. *Id.* at 2 (emphasis added).

funding to develop space-related products and technology.<sup>9</sup> As compared to their large counterparts, small businesses report that they are much more reliant on the USG for their research and development (R&D) activities.<sup>10</sup> The reality is that the commercial success of innovative space small businesses depends on USG investment.<sup>11</sup> Some space companies can rely on billions of dollars from their owners and investors, but the small businesses in the federal space supply chain do not have that same luxury.<sup>12</sup> How can the government rely on the technological innovation of small businesses in the commercial space industry if those small companies first require USG investment to find commercial success?

### B. *New Space v. Old Space Procurement*

While commercial R&D spending in the space industry is on the rise, the USG still spends twice as much on the development of new space technologies as the entire U.S. commercial space sector combined, though its lead is shrinking.<sup>13</sup> The USSF and space procuring agencies have started to recognize that the future of space procurement is commercial technology.<sup>14</sup> The days of new space systems driven by decades-long space procurements and multi-billion-dollar acquisitions are over.<sup>15</sup> The USSF's proposed "Alternative Acquisition System" recognizes this progression and stresses that the service must maintain close ties with private industry if it hopes to rapidly field modern and innovative space systems.<sup>16</sup> But the USSF must not lose sight of the

9. BUREAU OF INDUS. & SEC., U.S. DEP'T OF COM., U.S. SPACE INDUSTRY 'DEEP DIVE' ASSESSMENT: SMALL BUSINESSES IN THE SPACE INDUSTRIAL BASE 55 (2014).

10. *Id.*

11. Loren Grush, *Commercial Space Companies Have Received \$7.2 Billion in Government Investment Since 2000*, THE VERGE (June 18, 2019), <https://www.theverge.com/2019/6/18/18683455/nasa-space-angels-contracts-government-investment-spacex-air-force> [https://perma.cc/9GBW-W79Q].

12. See Alex Knapp, *Jeff Bezos Successfully Takes off on Blue Origin's First Crewed Spaceflight*, FORBES (July 20, 2021), <https://www.forbes.com/sites/alexknapp/2021/07/20/jeff-bezos-successfully-launches-on-blue-origins-first-crewed-spaceflight/?sh=215cf05f4bd2> [https://perma.cc/NX3U-2G8H] ("[Jeff Bezos has] put an estimated \$7.5 billion of his own money into the company.").

13. Ryan Brukardt & Jesse Klempner, *R&D for Space: Who Is Actually Funding It?*, MCKINSEY & CO. (Dec. 10, 2021), <https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/r-and-d-for-space-who-is-actually-funding-it> [https://perma.cc/3TUE-KE3Y]; *Global Space Economy Nears \$447B*, SPACE FOUND., <https://www.thespacereport.org/uncategorized/global-space-economy-nears-447b> [https://perma.cc/6AMU-CEA3] (\$51.8 billion on space-related activities in 2021) (last visited Oct. 27, 2022).

14. DEP'T OF THE AIR FORCE, ALTERNATIVE ACQUISITION SYSTEM FOR THE UNITED STATES SPACE FORCE 2, 14 (2020); see Sandra Erwin, *Military Building an Appetite for Commercial Space Services*, SPACE NEWS (June 25, 2021), <https://spacenews.com/military-building-an-appetite-for-commercial-space-services> [https://perma.cc/CAY4-QN63]; Sandra Erwin, *NASA, Space Force See Growing Opportunities to Use Commercial Space Services*, SPACE NEWS (Nov. 2, 2021), <https://spacenews.com/nasa-space-force-see-growing-opportunities-to-use-commercial-space-services> [https://perma.cc/8S89-SWYF]; Robert Van Steenburg, *Space Force Should Heed Commercial Practices*, NAT'L DEF. MAG. (July 9, 2021), <https://www.nationaldefensemagazine.org/articles/2021/7/9/space-force-should-heed-commercial-practices> [https://perma.cc/74T2-22CK].

15. See Matt Weinzierl & Mehak Sarang, *The Commercial Space Age Is Here*, HARV. BUS. REV., ¶¶ 2–5 (2021), <https://hbr.org/2021/02/the-commercial-space-age-is-here> [https://perma.cc/KR8C-E9GK].

16. DEP'T OF THE AIR FORCE, *supra* note 14, at 14.

need to help small businesses succeed in the “New Space” era. A rapid shift toward commercial space products will unintentionally exclude small businesses from the space industrial base—the same small businesses that USG seeks to rely on as the future of space procurement and space superiority.

The USG must focus its space small business programs on helping small businesses achieve success in the commercial marketplace, rather than in the closed system of government procurement. The USSF should leverage the tremendous growth of the commercial space market to alleviate some of the reliance of small businesses on the USG.<sup>17</sup> Where small businesses have had trouble in the past finding buyers for products developed using USG R&D funds, or trouble finding USG programs in need of their services, with help from the USSF these space-related small businesses can find greater success offering their services to the public moving forward.

### *C. A New Era in Space Procurement: New Space and the Acquisition of Commercial Space Technologies*

This Note identifies a number of short-term changes to the USSF’s acquisition framework that can help increase small business participation in space-related procurement programs. First, it provides a background on the benefits the USSF can realize through increased use of small businesses in its acquisition activities. Next, it addresses the difficulties small businesses experience in space procurement and provides recommendations for how the USSF and the Department of Defense (DoD) can support small businesses using existing small business programs to achieve mutually beneficial outcomes in new space procurement activities.

This Note also argues that these short-term changes are not enough. If Congress and the USG do not rethink the metrics for measuring the success of small business programs, the government will inadvertently harm small businesses in the commercial space sector and in future space procurement activities. To avoid this problem, Congress should modify the policies underlying small business programs and move away from the old dollar-based and proportion of total contracts success metrics to more nuanced future performance-based metrics that track the continued success of small businesses in the space industry writ large, rather than in government-funded programs.

## II. WHAT’S THE BIG DEAL ABOUT SMALL BUSINESSES?

### *A. What Does the USG Have to Do with Small Business?*

Congress has established a government-wide policy of promoting small businesses.<sup>18</sup> It believes that the security and economic wellbeing of the nation “cannot be realized unless the actual and potential capacity of small business is encouraged and developed.”<sup>19</sup> In furtherance of this goal, Congress requires

---

17. See Weinzierl & Sarang, *supra* note 15.

18. 15 U.S.C. § 631; FAR 19.201.

19. 15 U.S.C. § 631(a).

that the USG “aid, counsel, assist, and protect . . . the interests of small[] business[es] . . . [and] insure that a fair proportion of the [government’s] total purchases and contracts or subcontracts . . . be placed with small[] business[es] . . . to maintain and strengthen the economy of the Nation.”<sup>20</sup> Congress’s general goal has been to help more small businesses thrive and find success within the government and in the commercial sector.<sup>21</sup>

### *B. What Benefit Does the USG Get by Helping Small Businesses?*

Most policymakers in the United States believe that the country benefits by helping small businesses find success.<sup>22</sup> And much data tends to support that belief.<sup>23</sup> At a high level, helping small businesses work with the government leads to greater and more diverse participation in government procurement.<sup>24</sup> By awarding more contracts to more businesses, the government benefits through increased competition.<sup>25</sup> The Federal Acquisition Regulation (FAR) and the federal procurement system were designed based on the assumption that increased competition provides the greatest overall benefit to the government as compared to other potential goals.<sup>26</sup> Supporting small businesses increases competition and allows the government and the national economy to reap the benefits of free and competitive markets.<sup>27</sup> And increased market competition hopefully leads to better quality and better-priced products and services.<sup>28</sup> Finally, more small businesses working with the USG means a stronger and more resilient supply-chain.<sup>29</sup>

Dollar-for-dollar, small businesses are more innovative than their large business counterparts.<sup>30</sup> The DoD and all branches of service rely on small

20. *Id.*

21. ROBERT JAY DILGER, CONG. RSCH. SERV., R45576, AN OVERVIEW OF SMALL BUSINESS CONTRACTING 1–3 (2021).

22. See DEP’T OF DEF., SMALL BUSINESS STRATEGY 2–3 (2019) (“A strong, dynamic, and robust small business sector is critical to the health of our economy.”); OFF. OF SMALL BUS. PROGRAMS, DEP’T OF THE AIR FORCE, AIR FORCE SMALL BUSINESS PROGRAM PLAN 1–4 (2019) (“Our nation’s defense capabilities and economic prosperity rely on the innovation, agility, and efficiency provided by small businesses!”); Alicia M. Cullen, Note, *The Small Business Set-Aside Program: Where Achievement Means Consistently Failing to Meet Small Business Contracting Goals*, 41 PUB. CONT. L.J. 703, 706 (2012). But see Andrew G. Sakallaris, *Questioning the Sacred Cow: Reexamining the Justifications for Small Business Set Asides*, 36 PUB. CONT. L.J. 685, 689–90 (2007).

23. See BIPARTISAN POL’Y CTR., SUPPORTING SMALL BUSINESS AND STRENGTHENING THE ECONOMY THROUGH PROCUREMENT REFORM 5–10, 5 (2021).

24. *Id.*; 15 U.S.C. § 631; DEP’T OF DEF., *supra* note 22, at 3.

25. See KATE M. MANUEL, CONG. RSCH. SERV., R40516, COMPETITION IN FEDERAL CONTRACTING: AN OVERVIEW OF THE LEGAL REQUIREMENTS 2–4 (2011); BIPARTISAN POL’Y CTR., *supra* note 23.

26. MANUEL, *supra* note 25, at 2.

27. See JOHN M. OLSON ET AL., STATE OF THE SPACE INDUSTRIAL BASE 2021 34 (2021); BIPARTISAN POL’Y CTR., *supra* note 23, at 5–7.

28. DILGER, *supra* note 21. But see Sakallaris, *supra* note 22, at 689–93.

29. BIPARTISAN POL’Y CTR., *supra* note 23, at 3, 7.

30. 1 ADVISORY PANEL ON STREAMLINING AND CODIFYING ACQUISITION REGULS., REPORT OF THE ADVISORY PANEL ON STREAMLINING AND CODIFYING ACQUISITION REGULATIONS 169, 175 (2018) [hereinafter SECTION 809 REPORT] (citing M. PLEHN-DUJOWICH, PRODUCT INNOVATION BY YOUNG AND SMALL FIRMS, SMALL BUS. ADMIN. (2013), <https://www.sba.gov/sites/default>

businesses as an important source of innovation in defense procurement.<sup>31</sup> They provide fast and agile solutions to many of the government's unique problems,<sup>32</sup> often develop new technology faster than large businesses,<sup>33</sup> and they are able to rapidly prototype new technological solutions for the government.<sup>34</sup> Thus, helping small businesses succeed also ensures the government has access to an innovative workforce able to craft novel solutions for emerging problems.<sup>35</sup>

Increasing market competition is especially important in new and emerging fields like the commercial space sector.<sup>36</sup> New entrants will help diversify the space industrial base.<sup>37</sup> As critical sources of innovative economic activity and crucial components of a resilient and diversified supply chain, small businesses will likely be the primary drivers of future space exploration and advances in space technology.<sup>38</sup> In this regard, Jean Gustetic, Program Executive for NASA's Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) program, stated that "[o]ur path . . . to the moon and forward to Mars [depends on] hundreds of small businesses" throughout the United States.<sup>39</sup> She highlighted NASA's push to bring 3D printing technology to space, and how that effort has been driven by a small business with twenty-four employees that has "establish[ed] itself as the first commercially available manufacturing service in space."<sup>40</sup> Small businesses make up two-thirds of the suppliers for NASA's Artemis mission and Space Launch

---

/files/files/rs408tot.pdf [https://perma.cc/6K7N-XZ6L]; ANTHONY BREITZMAN ET AL., SMALL FIRMS AND TECHNOLOGY: ACQUISITIONS, INVENTOR MOVEMENT, AND TECHNOLOGY TRANSFER, SMALL BUS. ADMIN. OFF. OF ADVOC. (2004), [https://rdw.rowan.edu/cgi/viewcontent.cgi?article=1012&context=csm\\_facpub](https://rdw.rowan.edu/cgi/viewcontent.cgi?article=1012&context=csm_facpub) [https://perma.cc/PX6M-SCAR]; DIANA HICKS & ANTHONY BREITZMAN, SMALL SERIAL INNOVATORS: THE SMALL FIRM CONTRIBUTION TO TECHNICAL CHANGE, SMALL BUS. ADMIN., OFF. OF ADVOC. (2003), [https://rdw.rowan.edu/cgi/viewcontent.cgi?article=1038&context=csm\\_facpub](https://rdw.rowan.edu/cgi/viewcontent.cgi?article=1038&context=csm_facpub) [https://perma.cc/29PP-ZR9G]; ANALYSIS OF SMALL BUSINESS INNOVATION IN GREEN TECHNOLOGIES, SMALL BUS. ADMIN. OFF. OF ADVOC. (2011), <https://advocacy.sba.gov/2011/10/01/analysis-of-small-business-innovation-in-green-technologies> [https://perma.cc/JTE8-5WDQ].

31. DEP'T OF DEF., *supra* note 22, at 2–3.

32. SECTION 809 REPORT, *supra* note 30, at 169, 175.

33. *See id.*

34. *See id.*

35. *See generally* DILGER, *supra* note 21; OLSON ET AL., *supra* note 27, at 36; SECTION 809 REPORT, *supra* note 30, at 175.

36. Gabrielle Daley, *Building a Ladder to the Stars: A Competition Policy for the New Space Race*, 17 COL. TECH. L.J. 339, 365–66 (2019).

37. *See generally* OLSON ET AL., *supra* note 27, at 12, 18, 33–34.

38. *See id.* at 26; *Moon Landing to Mars Exploration: The Role of Small Business in America's Space Program: Hearing Before the S. Comm. on Small Bus. & Entrepreneurship*, 116th Cong. 116–139 (2019) [hereinafter Gustetic] (statement of Jenn Gustetic, Program Exec., Small Bus. Innovation Rsch. & Small Bus. Tech. Transfer, Nat'l Aeronautics & Space Admin.); Rob Starr, *Small Businesses Playing a Role in Future Space Exploration*, SMALL BUS. TRENDS (Sept. 22, 2020), <https://smallbiztrends.com/2020/09/vacuum-technology-incorporated-small-business-space-industry.html> [https://perma.cc/6YF2-Z2FM].

39. Gustetic, *supra* note 38, at 1.

40. *Id.* at 2.



System.<sup>41</sup> This proportion suggests that small business innovation will be a critical component of achieving the USSF's goal to develop and maintain tactical advantages over potential adversaries in space. The USG and the USSF have much to gain by helping small businesses succeed.

### C. *What's Standing in the Way of Helping Small Businesses?*

Promoting the success of small businesses has generally been a bipartisan endeavor.<sup>42</sup> For example, the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2022 included at least three new bipartisan provisions concerning small business contracting.<sup>43</sup> Both sides of the aisle regularly commit to helping small businesses find greater success when working with the government.<sup>44</sup> In the current administration, President Joseph R. Biden and the DoD have both focused on the importance of small businesses to the national economy and identified small business success as a top priority.<sup>45</sup>

Small business advocates regularly call for the USG to “cut the red tape” and make it easier for small businesses to work with the federal government.<sup>46</sup> Such red tape for small businesses can include, among other requirements, the need to create affirmative action plans,<sup>47</sup> stand-up new cost-accounting systems,<sup>48</sup> and, in recent years, implementation of vaccine mandates in the workplace.<sup>49</sup> A report by the Bipartisan Policy Center from July 2021 raised the alarm: the number of small businesses supplying products and rendering services for the federal government is shrinking.<sup>50</sup> Since 2005, the number of new small businesses entering the government procurement market is

41. Christian Zur, *Securing America's Small Business Space Sector*, SPACENEWS (May 5, 2020), <https://spacenews.com/securing-americas-small-business-space-sector> [<https://perma.cc/K2SW-39MW>].

42. BIPARTISAN POL'Y CTR., *supra* note 23, at 4–5.

43. COMM. ON SMALL BUS., U.S. HOUSE OF REPRESENTATIVES, *House Passes Bipartisan Small Business Contracting Provisions in NDAA Bill* (Dec. 8, 2021), <https://smallbusiness.house.gov/news/documentsingle.aspx?DocumentID=4100> [<https://perma.cc/9R38-WQMG>].

44. See Amara Omeokwe, *Where Trump and Biden Stand on Helping Small Businesses*, WALL ST. J. (Oct. 14, 2020), <https://www.wsj.com/articles/where-trump-and-biden-stand-on-helping-small-businesses-11602667801> [<https://perma.cc/C3RM-3QLL>] (“Both campaigns call for measures that would improve federal contracting opportunities for minority-owned businesses . . .”); *Where Obama, Romney Stand on Small Business Contracting*, ASSOCIATED PRESS (May 18, 2012), <https://www.cnn.com/2012/05/18/where-obama-romney-stand-on-small-business-contracting.html> [<https://perma.cc/LC4X-2TCL>].

45. Farooq A. Mitha, *Why Small Businesses Are Essential to U.S. National Security*, BUS. INSIDER (Oct. 11, 2021, 4:09 PM), <https://www.businessinsider.com/why-small-businesses-are-essential-to-us-national-security-2021-10> [<https://perma.cc/MP8G-JVRT>].

46. See John Fairlamb & Stephen K. Craven, *If DOD Wants Small Business Contracts, It Has to Cut the Red Tape*, HILL (Sept. 22, 2021), <https://thehill.com/opinion/national-security/573377-if-dod-wants-small-business-contracts-it-has-to-cut-the-red-tape> [<https://perma.cc/Y772-RAD2>]; BIPARTISAN POL'Y CTR., *supra* note 23.

47. *Federal Contractor Affirmative Action and Related Requirements*, EMPLOYER.GOV, <https://www.employer.gov/EmploymentIssues/Federal-contractor-requirements/Reporting> [<https://perma.cc/TSS8-CQN4>] (last visited Sept. 29, 2022).

48. FAR 31.201.

49. Exec. Order No. 14042, 86 Fed. Reg. 50,985 (Sept. 14, 2021).

50. BIPARTISAN POL'Y CTR., *supra* note 23, at 2.



down by seventy-nine percent.<sup>51</sup> The Biden administration has made it a goal to “[i]ncrease the number of new entrants to the federal marketplace [and] reverse the decline in the small business supplier base.”<sup>52</sup> While policymakers are concerned about the mass exodus of small businesses from government contracting, their concerns—at least regarding space procurement—may be misplaced.<sup>53</sup> Certainly, reducing the problems small business face when working with the government is an admirable goal, but is it enough?

*D. Growth Potential and Technical Capabilities—Space Small Businesses Still Need Help from USG to Grow and Scale.*

Despite their propensity for innovation, small business contractors often have trouble acquiring private investment.<sup>54</sup> As a result, many small businesses in the space supply chain have turned to the government as a source of “seed funding” to develop new and emerging technologies.<sup>55</sup> In its deep-dive assessment of the space industrial base, the Bureau of Industry and Security found that a majority of small business respondents felt that if the government reduced its space-related demands and reduced the amount of money that it spends on space-related R&D, this would cause “direct and indirect impacts on small businesses[,] regardless of their dependency on [government funds].”<sup>56</sup> Thus, the government must walk a fine line as it transitions to the procurement of commercial space technologies.<sup>57</sup> Small businesses have strong potential for growth in the global space market.<sup>58</sup> But their ultimate “success is hinged on shaky support by the U.S. Government . . . .”<sup>59</sup> The USSF must ensure that it is spending enough money on small business R&D to help small firms bring potential new products to market, while also procuring currently available commercial solutions to achieve programmatic goals.

### III. THE USSF’S CURRENT EFFORTS TO INVOLVE SMALL BUSINESSES

Overall military spending on space-related programs is illustrative of the problem faced by the USG. Space procurement dollars go primarily to large contractors, but the space industrial base is primarily non-traditional small

51. *Id.*

52. White House Press Release, Fact Sheet: Biden-Harris Administration Announces Reforms to Increase Equity and Level the Playing Field for Underserved Small Business Owners (Dec. 2, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/02/fact-sheet-biden-harris-administration-announces-reforms-to-increase-equity-and-level-the-playing-field-for-underserved-small-business-owners> [<https://perma.cc/PW5H-AKRX>].

53. *Compare id.*, with MARCY E. GALLO, CONG. RSCH. SERV., R43695, SMALL BUSINESS RESEARCH PROGRAM: SBIR AND STTR 35–37 (2021).

54. *See generally* BUREAU OF INDUS. & SEC., *supra* note 9, at 63.

55. *Id.* at 55, 58, 70.

56. *Id.* at 66.

57. *Cf.* Gustetic, *supra* note 38, at 4.

58. OLSON ET AL., *supra* note 27, at C-2.

59. *Id.* at 18 (citing SAMANTHA COHEN ET AL., CTR. FOR STRATEGIC AND INT’L STUDIES, NEW ENTRANTS AND SMALL BUSINESS GRADUATION IN THE MARKET FOR FEDERAL CONTRACTS (2018)).

businesses.<sup>60</sup> Because the stand-up of the USSF is still ongoing, only limited data is available concerning how the USSF has utilized small businesses in its procurement activities thus far. If the service follows the lead of its predecessor, the USSF will likely try to make use of the three primary small business programs available to the DoD: the SBIR program,<sup>61</sup> STTR program,<sup>62</sup> and the DoD Mentor-Protégé Program (MPP).<sup>63</sup> Efforts in this regard have already begun. For example, the USSF has created a program mirroring the DAF's AFWERX program called SpaceWERX.<sup>64</sup> The USSF describes SpaceWerx as a program that “inspires and empowers collaboration with innovators to accelerate capabilities and shape our future in space.”<sup>65</sup> SpaceWerx leverages the SBIR/STTR programs to connect with small businesses and help fund R&D.<sup>66</sup> At a SpaceWerx event in 2021, the USSF awarded \$32 million to nineteen businesses in the form of Phase II SBIR awards.<sup>67</sup> But that amount is a drop in the bucket in the grand scheme of total space dollars.<sup>68</sup>

It is helpful here to look at the USSF's predecessor, the Air Force Space Command (AFSC). In spite of the DAF's professed commitment to small businesses and the government's resounding praise concerning the benefits of relying on small businesses in defense procurement, AFSC, in FY 2013, had the smallest total percentage of small business dollars spent across the DAF and the federal government as a whole.<sup>69</sup> At 6.2% of its total budget, AFSC's total obligations to small businesses was significantly lower than the DAF's average for FY 2013 (14–15%),<sup>70</sup> and far below the DoD's current goal of awarding at

60. OLSON ET AL., *supra* note 27, at C-1; *see, e.g.*, NASA Budget, Fiscal Year 2021, USASpending.gov (Space Exploration Technologies Corp. – \$1,608,434,961; Lockheed Martin Corporation – \$1,348,769,765; The Boeing Company – \$1,023,645,656; Jacobs Technology Inc. – \$1,015,752,222).

61. GALLO, *supra* note 53 at 3–4.

62. *Id.* at 12–13.

63. 48 C.F.R. ch. 2, app. I; ROBERT JAY DILGER, CONG. RSCH. SERV, R41722, SMALL BUSINESS MENTOR-PROTÉGÉ PROGRAMS 1–4 (2022). As of September 29, 2022, neither USSF nor SBA have announced any Mentor-Protégé agreements concerning USSF.

64. *SpaceWERX Launch Drives AFWERX Small Business Focus on Universities and On-Orbit Capability*, AIR FORCE RSCH. LAB'Y PUB. AFFS. (Aug. 11, 2021), <https://www.afrl.af.mil/News/Article/2727417/spacewerx-launch-drives-afwerx-small-business-focus-on-universities-and-on-orbi> [<https://perma.cc/9UXX-W5WJ>].

65. SPACEWERX, <https://spacewerx.us> [<https://perma.cc/S64L-XS5N>] (last visited Nov. 11, 2021).

66. AIR FORCE RSCH. LAB'Y PUB. AFFS., *supra* note 64.

67. Sandra Erwin, *Space Force Awards \$32 Million in Contracts to Startups and Small Businesses*, SPACE NEWS (Aug. 20, 2021), <https://spacenews.com/space-force-awards-32-million-in-contracts-to-startups-and-small-businesses> [<https://perma.cc/7N4M-9TX4>].

68. *Compare id.* (noting awards to “19 companies that each will receive \$1.7 million [SBIR] Phase 2 contracts” to further develop their technologies), *with Air Force President's Budget*, DEP'T OF THE AIR FORCE, <https://www.saffm.hq.af.mil/FM-Resources/Budget/Air-Force-Presidents-Budget-FY22> (Space Force FY22 RDT&E budget request of \$11.3 billion) (last visited Oct. 27, 2022) [<https://perma.cc/WA9N-D47T>] [hereinafter DAF], and *Global Space Economy Rose to \$447B in 2020, Continuing Five-Year Growth*, SPACE FOUND. (July 15, 2021), <https://www.spacefoundation.org/2021/07/15/global-space-economy-rose-to-447b-in-2020-continuing-five-year-growth> [<https://perma.cc/VK82-PDX4>] (last visited Sept. 29, 2022).

69. NANCY Y. MOORE ET AL., RAND CORP., IMPROVING THE AIR FORCE SMALL BUSINESS PERFORMANCE EXPECTATIONS METHODOLOGY 6 n.15, 11 (2017).

70. *Id.*

least 22.5% of prime contracting dollars and 32.25% of subcontracting dollars to small businesses.<sup>71</sup> In comparison, NASA awarded 17.5% of its prime contract dollars and 39.3% of its subcontracting dollars to small businesses.<sup>72</sup> Data on the USSF's small business obligations are not yet available, but, even if the USSF gets to the same percentage as AFSC, that would mean it spends approximately \$700 million on small business programs.<sup>73</sup> Compared to the global space economy (\$447 billion),<sup>74</sup> that number appears negligible.

Whether the USSF's lofty goal of expanding the space industrial base through collaborative partnerships comes to fruition will depend on how it goes about supporting small businesses. Unfortunately, as currently written and implemented, the three small business programs mentioned above are not suitable for the USSF's goal.

#### IV. SMALL BUSINESSES WILL NOT OR CANNOT WORK WITH THE DOD SPACE PROCURING AGENCIES

##### *A. General Small Business Problems Working with the USG*

Though small businesses experience a significant number of problems uniquely associated with space procurement, they also face various non-space-specific government procurement related problems. As such, it is helpful to start with a brief look at some of the common issues that small businesses have when working with the federal government. Small businesses often complain that competing for government contracts entails red tape and burdensome regulations which discourage them from working with the government.<sup>75</sup> Often when a small business might be willing to work with the government, contracting officers (COs) are unaware of small businesses that can meet government needs.<sup>76</sup> Even if a CO knows that a small businesses can meet the government's needs, small businesses are often scared away by the slow speed of government acquisition and the length of the acquisition cycle.<sup>77</sup> When working with the DoD, small businesses have an especially difficult time understanding the government's needs because the DoD uses a lot of agency- and government-specific terms that have no contemporaries in the private

---

71. *Small Business Program Goals and Performance*, DEP'T OF DEF., <https://business.defense.gov/About/Goals-and-Performance> [<https://perma.cc/42YB-EAFT>] (last visited Sept. 29, 2022).

72. SMALL BUS. ADMIN., NATIONAL AERONAUTICS AND SPACE ADMINISTRATION: FY2020 SMALL BUSINESS PROCUREMENT SCORECARD (2021).

73. See DAF, *supra* note 68 (noting that USSF's FY22 total RDT&E budget request is \$11.3 billion). The request of \$11.3 billion multiplied by AFSC's most recent small business spend (6.2%) suggests that USSF will end up spending about \$700 million on small business programs.

74. SPACE FOUND., *supra* note 68.

75. OLSON ET AL., *supra* note 27, at 88.

76. See *id.* at C-7; U.S. GOV'T ACCOUNTABILITY OFF., SPACE ACQUISITIONS CHALLENGES IN COMMERCIALIZING TECHNOLOGIES DEVELOPED UNDER THE SMALL BUSINESS INNOVATION RESEARCH PROGRAM 20 (2010); SECTION 809 REPORT, *supra* note 30, at 178–79.

77. BIPARTISAN POL'Y CTR., *supra* note 23, at 12 (“Small business owners consistently said the process is too time-consuming and too complicated, that there is not enough information on federal contract opportunities, and that they feel success is unlikely because small businesses are not adequately prioritized.”).

commercial sector.<sup>78</sup> Finally, the system for awarding small business set-asides makes small businesses afraid of growing too big and losing out on government contracts.<sup>79</sup> In addition to these more general problems, small businesses working in the space industry have unique concerns of their own.

### B. Space Small Business Procurement Issues

To achieve the USSF's goal of a fast and agile innovation-focused procurement system, any acquisition framework must help small businesses overcome the structural barriers inherent in a space-based procurement system. In their 2021 State of the Space Industrial Base Report, the Defense Innovation Unit, USSF, and the Air Force Research Laboratory noted that while "[m]ost innovation, economic growth and jobs come from small business . . . structural barriers 'architect out' many would-be commercial providers."<sup>80</sup> Small businesses are forced to overcome "[s]pecial requirements and modifications, security requirements, fiscal risk profiles, lengthy timelines to award, significant demand for meetings, [and] paperwork-chase proposals," all while facing numerous other challenges unique to space.<sup>81</sup>

#### 1. Space Technologies Are Expensive to Develop

Space-related technologies are more expensive to develop, and small businesses often have problems finding funding to develop such technology.<sup>82</sup> To make matters worse, developmental costs are often extremely high.<sup>83</sup> Large contractors are more likely to have the ability to fund the development of their own commercial space technology and sell finished products to the government.<sup>84</sup> Small businesses, on the other hand, are far more reliant on government R&D funds to develop new space technologies.<sup>85</sup> One unique issue is that space-related technologies require specialized testing facilities that are often cost-prohibitive for small businesses competing for USG contracts.<sup>86</sup> Before a technology developed by a small business is declared flight ready, it must undergo extensive testing to ensure that it will survive the unforgiving environment of space.<sup>87</sup>

Figure 1 shows a general testing flow diagram suggested by the California Polytechnic State University for the development of a "CubeSat." Before it is

78. SECTION 809 REPORT, *supra* note 30, at 178 ("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 non-compliant with what DoD actually requires."); see BIPARTISAN POL'Y CTR., *supra* note 23, at 18.

79. SECTION 809 REPORT, *supra* note 30, at 177.

80. OLSON ET AL., *supra* note 27, at 34.

81. *Id.*

82. *See id.* at 56.

83. *Id.*

84. BUREAU OF INDUS. & SEC., *supra* note 9, at 55. *See generally* LORRIE A. DAVIS & LUCIEN FILIP, AEROSPACE CORP., HOW LONG DOES IT TAKE TO DEVELOP AND LAUNCH GOVERNMENT SATELLITE SYSTEMS 1 (2015).

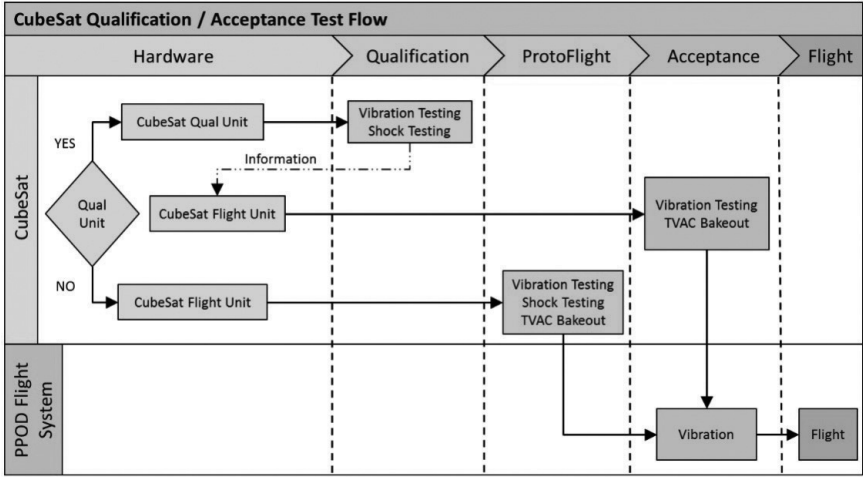
85. BUREAU OF INDUS. & SEC., *supra* note 9, at 55.

86. U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 76, at 17.

87. *Id.* *See generally* SPACE STANDARDS, DEFENSE STANDARDIZATION PROGRAM JOURNAL (Jan./Mar. 2017 edition).

ready for flight, a CubeSat needs to undergo at least eight rounds of testing.<sup>88</sup> The Hawaii Space Flight Laboratory provides estimated costs for use of its testing facilities.<sup>89</sup> To use the lab’s thermal vacuum chamber, the rough order of magnitude cost is \$17,000 per week.<sup>90</sup> For attitude determination and control system testing the cost is \$19,000 per week.<sup>91</sup> Depending on the amount of testing needed, a contractor could easily spend thousands of dollars on access to testing facilities alone, even for the construction of a CubeSat.<sup>92</sup> For large contractors, this sum is likely not a major problem. For small businesses it can be fatal. In its review of space-related SBIR contracts, GAO noted that one of the small businesses that it interviewed “said it had the opportunity to transition its technology [to Phase III] . . . but to do so, it needed an advanced microcircuit that cost \$750,000.”<sup>93</sup> As a result, the small business was unable to bring its technology to market.<sup>94</sup>

Figure 1. CubeSat Testing Flow Diagram by the California Polytechnic State University.<sup>95</sup>



88. See CAL. POLYTECHNIC STATE UNIV., CUBE SAT DESIGN SPECIFICATION (CDS) REV. 13–15 (Feb. 20, 2014).

89. *Integration and Testing*, HAW. SPACE FLIGHT LAB’Y, <https://www.hsfl.hawaii.edu/facilities> [<https://perma.cc/7BXY-FHWT>] (last visited Oct. 12, 2022). The Hawaii Space Flight Laboratory provides commercial test facilities for space-related businesses.

90. *Id.*

91. *Id.*

92. Compare *id.*, with CAL. POLYTECHNIC STATE UNIV., *supra* note 88. CubeSats are a class of nanosatellites measuring 10x10x10 centimeters that are intended to “provide a cost effective platform for science investigations, new technology demonstrations and advanced mission concepts using constellations, swarms disaggregated systems.” Elizabeth Mabrouk, *What Are SmallSats and CubeSats*, NASA (Feb. 26, 2015), <https://www.nasa.gov/content/what-are-smallsats-and-cubesats> [<https://perma.cc/3RW6-W39K>].

93. U.S. GOV’T ACCOUNTABILITY OFF., *supra* note 76, at 20–21.

94. *Id.*

95. CAL. POLYTECHNIC STATE UNIV., *supra* note 88.

## 2. Space Procurements May Require Access to Launch Capabilities

Historically, the developmental costs of satellites dwarf in comparison to the costs of sending an object into outer space, though this has become less of a problem in recent years.<sup>96</sup> The total cost of a launch can vary drastically depending on the type of launch vehicle being used. For \$2.5 million, a small business could send 330 pounds of payload into space onboard SpaceX's "Falcon 9" as part of a separately planned launch, or for \$5.7 million it could get its own dedicated launch using Rocket Lab's "Electron."<sup>97</sup> To send a payload to the International Space Station, NASA charges commercial activities approximately \$20,000 per kilogram of weight.<sup>98</sup> Small businesses seeking to launch an object into space will also likely face serious backlogs and competition from larger businesses that often jump to the front of commercial lines by block-buying launches.<sup>99</sup> Unfortunately, there is no way around these delays.<sup>100</sup> The median delay for all small satellites launched in the last five years was 128 days.<sup>101</sup> While a small business could try to avoid these problems by going through the USG, they are likely to experience serious delays when working with the federal government as well.<sup>102</sup>

## 3. Space Is Highly Regulated, and Compliance Is Costly

Small businesses often have difficulty understanding the space industry's complex regulatory regime.<sup>103</sup> Commercial space transportation and launches are governed by at least eight primary pieces of legislation in addition to thousands of pages of regulations, other policies,<sup>104</sup> and the yearly National

96. See Gil Denis et al., *From New Space to Big Space: How the Commercial Space Dream Is Becoming a Reality*, 166 ACTA ASTRONAUTICA 431, 434–36 (2020).

97. Darrell Etherington, *Rocket Lab Points Out That Not All Rideshare Rocket Launches Are Created Equal*, TECHCRUNCH (Jan. 30, 2020), <https://techcrunch.com/2020/01/30/rocket-lab-points-out-that-not-all-rideshare-rocket-launches-are-created-equal> [https://perma.cc/V8Y3-489M].

98. NASA, COMMERCIAL AND MARKETING PRICING POLICY, <https://www.nasa.gov/leo-economy/commercial-use/pricing-policy> [https://perma.cc/AG2X-8A6Q] (last visited Jan. 23, 2022) (NASA provides launch services to commercial and marketing activities. To support these missions, it publishes pricing for private astronaut missions that reflect "full reimbursement for the value of NASA resources," and "[a]ny proposals or awards for private astronaut missions [are] subject to the [stipulated] prices.").

99. Jeff Mathews, *The Decline of Commercial Space Launch Costs*, DELOITTE CONSULTING LLP, <https://www2.deloitte.com/us/en/pages/public-sector/articles/commercial-space-launch-cost.html> [https://perma.cc/C2LQ-8YA3] (last visited Jan. 23, 2022); see Jeffrey Hill, *Rocket Lab Grows Backlog by 30%, Acquires Space Separation Systems Company PSC*, VIA SATELLITE (Nov. 11, 2016), <https://www.satellitetoday.com/business/2021/11/16/rocket-lab-grows-backlog-by-30-acquires-space-separation-systems-company-psc> [https://perma.cc/C6T7-588E].

100. See generally BRYCE TECH, SMALLSAT LAUNCH DELAYS (2021) (finding that "[a]ll smallsats on commercial launches in the last 5 years experienced delays").

101. *Id.*

102. Cf. Stephen Clark, *Payload Issue Delays SpaceX's Next Falcon Heavy Launch to Early 2020*, SPACEFLIGHT NOW (Oct. 4, 2021), <https://spaceflightnow.com/2021/10/04/payload-issue-delays-spacexs-next-falcon-heavy-launch-to-early-2022> [https://perma.cc/8U3X-H9UC].

103. See generally BUREAU OF INDUS. & SEC., *supra* note 9, at 8, 66 ("Finally, these studies touched on common issues, such as finding skilled workers, dealing with complex export control regulations, handling government purchasing requirements, and many other challenges.").

104. See Communications Act of 1934, 47 U.S.C. §§ 151–163; National Aeronautics and Space Act of 1958, 51 U.S.C. §§ 20101–20164; Commercial Space Launch Act of 1984, 51 U.S.C.



Defense Authorization Act.<sup>105</sup> A review of all the regulations and laws that a small business must comply with in order to develop and launch an object into space is beyond the scope of this Note, but it is certainly a daunting endeavor for any business that decides to enter the space industry. To make matters worse, federal regulators have been unable to keep up with the pace of innovation in the industry, leading to largely ineffective and confusing bodies of national space law.<sup>106</sup>

#### 4. Commercialization of Space Technology Is Difficult

Even when a small business is able to overcome the hurdles of product development, it will often have difficulty commercializing space technologies that it develops for the government.<sup>107</sup> Products developed using SBIR/STTR funding might make it through Phase I and II only to fail once the small business contractors seek to sell their products to government partners or prime contractors during the commercialization phase of product development. This problem is compounded by the fact that small businesses often have trouble working with the government because COs are risk-averse.<sup>108</sup> Procurement officials are afraid of relying on small businesses for the development and procurement of space-related technologies.<sup>109</sup> These officials see large contractors as being less risky and better positioned to navigate the complexities of building space systems.<sup>110</sup> Large contractors, on the other hand, often have no positive incentive to work with small businesses, and some would rather acquire a small business with a promising product rather than purchase or license its commercial solutions.<sup>111</sup> Together these factors demonstrate that small businesses are significantly disadvantaged when it comes to commercialization.

### V. USING CURRENT SMALL BUSINESS SET-ASIDE PROGRAMS FOR SHORT-TERM GROWTH

Rather than start from scratch, the USSF should make use of existing small business set-aside programs to encourage the participation of more small businesses in space procurement. By making changes to the SBIR, STTR, and

---

§§ 50901–50923; Land Remote-Sensing Policy Act of 1992, 15 U.S.C. §§ 5601–5641; U.S. Commercial Space Launch Competitiveness Act of 2015, Pub. L. No. 114-90; Weather Research and Forecasting Innovation Act of 2017, Pub. L. No. 115-25; National Aeronautics and Space Administration Transition Authorization Act of 2017, 51 U.S.C. § 10101.

105. See, e.g., William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, Pub. L. No. 116-283.

106. See Michael B. Runnels, *On Clearing Earth's Orbital Debris & Enforcing the Outer Space Treaty in the U.S.*, BUS. L. TODAY, Jan. 2022 ¶ 4, 11–16; see also Claudia Geib, *The US Government Has No Idea What to Do About Small Satellites*, FUTURISM (Apr. 11, 2018), <https://futurism.com/small-satellites-us-government> [<https://perma.cc/EKB4-VLAD>].

107. See generally U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 76.

108. *Id.* at 19.

109. *Id.*

110. *Id.*

111. *Id.*



MPP programs, the USSF can ensure that, in the short-term, small businesses have an opportunity to grow along with the commercial space market.

### A. SBIR/STTR Programs

#### 1. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs

Congress created the SBIR program in 1982 as a way to help innovative small businesses participate in federally funded R&D.<sup>112</sup> It recognized that, while small businesses are among the most cost-effective solutions to R&D needs, they only account for a very small percentage of the total R&D dollars spent in the United States.<sup>113</sup> Congress further reinforced its commitment to involving small businesses in federally funded R&D through the establishment of the STTR program.<sup>114</sup> The key difference between the SBIR and STTR programs is that the STTR program requires that the small business collaborate with a nonprofit research institution for the development and commercialization of its technology or product.<sup>115</sup>

Federal agencies with an extramural R&D budget greater than \$100 million must set aside at least 3.2% of their funds for the SBIR program, and agencies with R&D budgets above \$1 billion must also set aside an additional 0.45% of their extramural R&D budgets to fund projects under the STTR program.<sup>116</sup> In FY 2019, the DoD failed to meet the minimum spending requirement, as SBIR funding only accounted for 3.04% of its overall extramural R&D spending.<sup>117</sup> Of the major defense agencies, the DAF performed the worst in meeting its minimum spend goal (2.58%).<sup>118</sup>

Besides the relatively limited amount of funds available from the government, small businesses also face problems in terms of the total amount of funding available in Phase I and II. The award limits on SBIR contracts are too low to support the development of space technology.<sup>119</sup> The SBIR/STTR statute limits Phase I awards to a maximum of \$150,000 adjusted for inflation.<sup>120</sup> This limit means that agencies are currently allowed to issue Phase I awards up to a maximum of \$295,924.<sup>121</sup> They can also request a waiver from the SBA if they want to make an award that exceeds the \$295,924 limit.<sup>122</sup>

112. GALLO, *supra* note 53.

113. *Id.* (citing Small Business Innovation Development Act of 1982, Pub. L. No. 97-219 (1982)).

114. *Id.* (citing Small Business Research and Development Enhancement Act of 1992, Pub. L. No. 102-564 (1992)).

115. *The SBIR and STTR Programs*, SMALL BUS. ADMIN., <https://www.sbir.gov/about> [https://perma.cc/JF99-64TJ] (last visited Jan. 29, 2022).

116. *Id.*

117. SMALL BUS. ADMIN., SBIR AND STTR ANNUAL REPORT FOR FISCAL YEAR 2019, at 17 (2020).

118. *Id.*

119. *See* BUREAU OF INDUS. & SEC., *supra* note 9, at 62–65.

120. 15 U.S.C. § 638.

121. SMALL BUS. ADMIN., *supra* note 117.

122. *Id.*

The Phase I award is intended to support concept development and usually covers a period from six months to a year.<sup>123</sup> SBIR Phase II awards are capped at \$1,972,828 for two years.<sup>124</sup> Phase II is intended to help continue the R&D efforts started under a Phase I award with the intent to move towards commercialization of the product in Phase III.<sup>125</sup> However, many small business contractors experience what they call the “valley of death” between Phase II and Phase III.<sup>126</sup> Because Phase II money is not enough to qualify the products for use in space, small businesses “require Phase III investment to do [space] qualification.”<sup>127</sup>

## 2. Changes to SBIR/STTR in the Space Acquisition Framework

### i. Increase Funding and Limits

Unfortunately, the SBIR funding restrictions are not well-suited to the development of space technologies.<sup>128</sup> As discussed above in Section IV.B, space technologies are inherently more expensive, more highly regulated, and sometimes take more effort to develop and test. To solve these problems, Congress should amend the SBIR/STTR statutes to provide small businesses with more funding, more support, faster award times, and longer contract periods as needed. Congress must raise the USSF’s SBIR/STTR budget allocation so that more small businesses have an opportunity to participate in these programs and COs are encouraged to make use of SBIR/STTR funds. It should also amend the SBIR/STTR statutes so that fifteen percent (15%) of the USSF’s extramural R&D budget would go to the SBIR/STTR Programs. For FY 2023, the USSF requested \$15.8 billion for R&D.<sup>129</sup> A fifteen percent allocation would mean that \$2.370 billion dollars would be available for use in the SBIR/STTR program as compared to just \$576,700,000 under the current 3.65% allocation. This increase is critical to ensure a reliable government source of seed-funding to support companies in the space industry.<sup>130</sup> Congress could also allow the USSF to use excess SBIR/STTR funds to procure commercial products developed using SBIR/STTR funding. Small businesses need help from the government to develop their space-related technologies.<sup>131</sup> This increase and additional flexibility make those funds available.

Congress must increase the size of awards allowed to be made under the SBIR/STTR programs as the program does not currently provide sufficient

---

123. *Id.*

124. *Id.*

125. *Id.*

126. BUREAU OF INDUS. & SEC., *supra* note 9, at 62.

127. *Id.*

128. *See id.* at 63 (“The gap between a new technology development, however promising, and a space qualified product usually outstrips the dollars available in SBIR or other similar technology development program[s].”) (internal quotations omitted).

129. *Air Force President’s Budget FY 2023*, DEPT. OF THE AIR FORCE, <https://www.saffm.hq.af.mil/FM-Resources/Budget/Air-Force-Presidents-Budget-FY23> [<https://perma.cc/PR2M-36MJ>] (last visited Oct. 11, 2022).

130. *Cf. Gustetic*, *supra* note 38, at 3.

131. *See id.* at 4; *supra* discussion, at notes 77–82.

funding to mature space technologies or satisfy the rigorous testing required by the DoD for space-related technologies.<sup>132</sup> And finally, Congress must increase funding for SBIR/STTR awards within the USSF to account for the increased costs associated with developing space technology. At a minimum, Congress should increase Phase I award limits to \$2.5 million and Phase II award limits to \$10 million. While no specific number exists as to what it costs to develop new space technologies, these increases provide enough flexibility—and a wide enough margin of error—that the government and the contractor should not run into difficulties funding R&D efforts.

ii. Guaranteed Phase III Support

To support product commercialization, Congress and the DoD should also amend the SBIR/STTR program to provide for limited guaranteed funding and government support during a product's transition from Phase II to Phase III. The DAF and the USSF have attempted to provide such support through the Strategic Funding Increase (STRATFI) and Tactical Funding Increase (TACFI) Supplemental Funding Pilot Programs.<sup>133</sup> STRATFI and TACFI are intended to “catalyze relationships between the Air Force[,] Space Force . . . and [the private sector],” and to “bridge the capability gap between . . . Phase II efforts and Phase III scaling . . . .”<sup>134</sup> In addition to making these programs permanent within the USSF, and increasing the number of small businesses eligible to participate, the government should provide limited matching funds from the SBIR/STTR program during Phase III to help generate interest from investors. Small businesses with Phase II contracts transitioning to Phase III should also be provided with low-cost opportunities and partnerships with government entities to space-qualify their products. These changes would mean that small businesses are involved in USSF R&D to the maximum extent possible, with an eye towards commercializing products developed through SBIR/STTR, and towards strengthening the commercial space sector. If a small business fails to transition to Phase III, the USG has essentially wasted its investment in a promising technology, and it loses access to an otherwise viable space supplier.

iii. Leverage the Mentor-Protégé Program

Finally, the USSF should link its SBIR/STTR contracts with the DoD MPP.<sup>135</sup> The SBA has already taken a similar step for firms in its SBIR/STTR program.<sup>136</sup> Under a mentor-protégé agreement, protégés can receive developmental assistance from mentors.<sup>137</sup> The DoD's MPP anticipates that mentors will provide assistance with “[g]eneral business management, including

132. See U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 76, at 20.

133. AFWERX, STRATFI/TACFI 1–4 (2021), [https://www.afsbirsttr.af.mil/Portals/60/documents/STRATFI\\_TACFI\\_v1.pdf](https://www.afsbirsttr.af.mil/Portals/60/documents/STRATFI_TACFI_v1.pdf) [<https://perma.cc/K22N-F79J>].

134. *Id.* at 3.

135. *Infra* discussion, at notes 168–84.

136. See DILGER, *supra* note 63, at 4–5.

137. DFARS § 219.71.

organization management, financial management, and personnel management, *marketing, business development and overall business planning*.<sup>138</sup> While not expressly contemplated in the DoD's MPP, a mentor could help a protégé commercialize its product in exchange for credit towards its subcontracting goals, a percentage of profits, an equity stake, or any other suitable arrangement between the parties.<sup>139</sup> At the request of a contractor transitioning from Phase II to Phase III, or upon the USSF's receiving notice that a contractor has failed to transition from Phase II to Phase III, the USSF could advise potential suitable mentors about the possibility of a new mentor-protégé agreement. The DoD would also benefit from implementing a system like the SBA's All Small Mentor Protégé Program (ASMPP), which allows joint ventures between mentors and protégés to compete for small business set-asides.<sup>140</sup> To realize the greatest potential impact, these joint ventures between a mentor and protégé under an MPP agreement should also be allowed to compete for R&D SBIR/STTR contracts. These changes would help to alleviate many of the problems small businesses face in space procurement and ensure that the USSF has access to the innovative capabilities of small businesses as it seeks to maintain space superiority in the years to come.

## B. Mentor-Protégé Program

### 1. The DoD's Mentor-Protégé Program

Congress envisioned the various mentor-protégé programs as a way to provide small businesses with the resources and support necessary to succeed in their own right as federal contractors.<sup>141</sup> While agencies can create an agency-specific MPP, most use the SBA's government-wide MPPs.<sup>142</sup> The SBA's 8(a) MPP and ASMPP account for over ninety percent of all MPP agreements.<sup>143</sup> The DoD's MPP is the largest program not administered by the SBA.<sup>144</sup> Under both of the SBA's MPPs, and most of the other agency MPPs, a small business "may receive financial, technical, or management assistance from mentors" in order to help the small business obtain or perform federal contracts or subcontracts.<sup>145</sup> In contrast, the DoD's MPP is focused on helping small businesses obtain DoD subcontracts and helping them to serve

138. DFARS App. I-106(d)(1)(i) (emphasis added).

139. See *id.*

140. *Infra*, notes 174–75.

141. See Small Business Mentor Protégé Programs, 81 Fed. Reg. at 48,574; U.S. Gov't ACCOUNTABILITY OFF., GAO/NSAID-94-101, DEFENSE CONTRACTING: IMPLEMENTATION OF THE PILOT MENTOR-PROTEGE PROGRAM I (1994); Small Business Jobs Act of 2010, Pub. L. No. 111-240, § 1345(a), 124 Stat. 2504, 2546.

142. See U.S. SMALL BUS. ADMIN., REPORT TO CONGRESS ON MENTOR-PROTÉGÉ PROGRAMS FOR FISCAL YEAR 2020 6, 8 (2021) [hereinafter MPP REPORT FY20]. Seven agencies have active MPPs: the DoD, Department of Energy (DoE), Department of Transportation (DoT), Department of Homeland Security (DHS), General Services Administration (GSA), National Aeronautics and Space Administration (NASA), and Small Business Administration (SBA).

143. *Id.* at 6.

144. *Id.* at 8.

145. DILGER, *supra* note 63, at 1–3.

as suppliers on other DoD contracts.<sup>146</sup> One of the unique benefits offered by the SBA's ASMPP is that a mentor and its protégé can form a joint venture to compete for small business set-aside contracts.<sup>147</sup> MPPs formed under the ASMPP also allow mentors to provide equity investments, loans, and bonding to protégés.<sup>148</sup>

During FY 2020, mentors helped protégés develop technical capabilities in “aerospace and lean manufacturing . . . telecommunication and satellite services,”<sup>149</sup> provided “[g]uidance on . . . manufacturing,”<sup>150</sup> “train[ed] [protégés] on mentor’s products, services, and cyber security,”<sup>151</sup> and “provide[d] rent-free use of mentor’s facilities . . .”<sup>152</sup> Within the DoD, “mentors helped proteges receive Facility Security Clearances . . . [and] certification[s] such as ISO 9000, CSSIP, and CMMI.”<sup>153</sup>

While the success of small businesses is the primary concern of MPPs, both mentors and proteges derive substantial benefit from participation.<sup>154</sup> Under the DoD's MPP, mentors can receive reimbursement for a certain amount of the costs that they incur by assisting protégés.<sup>155</sup> For any unreimbursed costs, a mentor can receive credit towards its statutorily mandated subcontracting goals.<sup>156</sup> Protégés, on the other hand, benefit through broad exposure to the federal procurement system, increased competitive advantage when bidding on federal contracts, and free technical and business assistance.<sup>157</sup> The DoD's MPP also allows protégés subcontracting for mentors to receive DoD reimbursable advance payments and installments prior to a project's completion.<sup>158</sup> This allowance can help small businesses who might otherwise be unable to complete a contract due to cashflow issues, by providing necessary funds to complete performance.

## 2. Potential Benefits to Using MPPs for Space Procurement

The MPP seems like a great way for small businesses to break into the space industry. Small businesses face four critical problems when they compete for USG space contracts: (1) the cost to develop new space technologies; (2) difficulty commercializing space technologies developed for the government;

---

146. *Id.* at 10.

147. *Joint Ventures*, SMALL BUS. ADMIN., <https://www.sba.gov/federal-contracting/contracting-assistance-programs/joint-ventures> [<https://perma.cc/C7CC-Y9FM>] (last visited Sept. 29, 2022).

148. See DILGER, *supra* note 63, at 8.

149. MPP REPORT FY20, *supra* note 148, at 11 (NASA).

150. *Id.* at 12 (SBA).

151. See U.S. SMALL BUS. ADMIN., REPORT TO CONGRESS ON MENTOR-PROTÉGÉ PROGRAMS FOR FISCAL YEAR 2019 42 (2020) [hereinafter MPP REPORT FY19] (GSA).

152. *Id.* at 42 (GSA).

153. *Id.* at 8 (DoD).

154. DILGER, *supra*, note 63, at 1–2, 7–8, 14.

155. DFARS App. I-109. Mentor reimbursements are capped at \$1 million per fiscal year unless the contractor receives written approval from the DoD that unusual circumstances justify a higher amount. See DFARS App. I-109(d); DILGER, *supra* note 63, at 13.

156. DFARS App. I-110.1(a); DILGER, *supra* note 63, at 13.

157. DILGER, *supra* note 63, at 13.

158. DFARS App. I-106(d)(4).

(3) an insular space procurement industry wary of new entrants; and (4) risk averse COs procuring space technology.<sup>159</sup> In addition to receiving technical assistance, the DoD MPP can provide unique benefits to a new entrant into the space industry.

An MPP agreement can help defray many of the costs of developing space technologies. For example, a small business could potentially enter into an MPP agreement with a mentor that would allow it to make use of the mentor's specialized testing facilities.<sup>160</sup> MPPs have been used in the past to provide rent-free access to mentor facilities, so this type of arrangement would likely be reimbursable under current DoD regulations.<sup>161</sup> Small businesses are also often unable to compete for certain government contracts because they lack security clearances.<sup>162</sup> An MPP agreement can be used to help a small business acquire a security clearance.<sup>163</sup> A protégé could potentially leverage its agreement with a mentor to gain access to launch capabilities that would otherwise be unavailable to it. Critically, a protégé could also make use of a mentor's knowledge and expertise in compliance and regulatory matters concerning space, in order to decrease the overall cost of developing new space technologies and performing space-related contracts.<sup>164</sup> Mentors with extensive experience working on space government contracts will have a better understanding of the regulatory regime applicable to space and will be able to impart that knowledge on their protégés. Finally, even after the development of a technology, a protégé could receive business assistance to help with the product's commercialization.<sup>165</sup>

An MPP agreement might also be able to help smooth many of the more intangible issues concerning access to DoD officials and establishment of business relationships with major space prime contractors.<sup>166</sup> By working with a more established contractor, a protégé will have more access to the industry in general and USSF procurement officials in particular. Finally, an active MPP agreement can help assuage the fears of COs that might otherwise avoid working with a small business. A CO would likely be more comfortable awarding a contract to (or integrating the technologies of) a protégé with an MPP over a small business lacking such an agreement.

### 3. DoD's MPP Is Underutilized and Ill-Suited for Space Procurement

Unfortunately, the DoD MPP is underutilized, underfunded, and outdated. On January 1, 2019, the DoD had sixty-one active mentor-protégé

159. See discussion *supra* notes 103–39.

160. See MPP REPORT FY19, *supra* note 157, at 42 (reporting that an MPP provided protégé with access to mentor's facilities).

161. *Id.*

162. U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 76, at 18.

163. See MPP REPORT FY19, *supra* note 157, at 42.

164. Cf. Jessica Tillipman & Vijaya Surampudi, *The Compliance Mentorship Program: Improving Ethics and Compliance in Small Government Contractors*, 49 PUB. CONT. L.J. 217, 219–20, 234–35 (2020) (proposing the use of MPPs to incentivize large contractors to help small businesses develop effective anti-corruption compliance programs).

165. See discussion *supra* notes 163–67.

166. See U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 76, at 17–19.

agreements.<sup>167</sup> In FY 2019, the DAF had fifteen MPPs, the Army had thirteen, the Defense Intelligence Agency had nine, the Missile Defense Agency had twelve, the Navy had four, the National Guard had three, and the remaining seven MPPs were distributed among DCMA, NSA, and SOCOM.<sup>168</sup> In comparison, NASA (a much smaller agency in terms of both funding and overall size) had ten active MPPs in its program.<sup>169</sup> This means NASA had almost as many active MPPs as the Army, despite the Army having a budget almost seven times as large.<sup>170</sup> When further considered in light of the 44,768 distinct small businesses that received contracts from the DoD in FY 2020, this number is disappointing, as it means that only 0.14% of small business contractors are taking advantage of the DoD MPP.<sup>171</sup>

What is keeping more small businesses from making use of mentor-protégé agreements? While there is no definitive answer, a culmination of issues could contribute to the program's lack of traction. Small businesses may perceive mentor-protégé agreements as disproportionately benefitting large contractors, or they may be concerned that involving a large contractor will lead to a controlling relationship rather than a true mentor-protégé arrangement.<sup>172</sup> Some mentors use the program to benefit themselves in an attempt to bid on contracts for which they would otherwise be ineligible.<sup>173</sup> It could be that potential protégés have problems finding a suitable mentor. The DoD's MPP states that mentor firms are solely responsible for the selection of potential protégés.<sup>174</sup> If the drawbacks to participation far outweigh the incentives, large firms may be reluctant to take on protégés. What's more, because the program caps reimbursement for developmental costs at \$1 million, the developmental costs of space technology might be too high to make it worthwhile for mentors.<sup>175</sup> Add to this the fact that the DoD's program only received about \$30 million in FY 2021, and its underutilization starts to make sense.<sup>176</sup> Additional research should investigate why more small firms do not have active MPPs.

---

167. MPP REPORT FY20, *supra* note 148, at 22.

168. DAVE VENLET, DEF. BUS. BD., MENTOR PROTÉGÉ PROGRAM (MPP) ASSESSMENT STUDY 6–8 (2019).

169. MPP REPORT FY20, *supra* note 148, at 8. This number is not inclusive of other MPPs that may have been entered into by NASA contractors under a relevant SBA MPP.

170. *Compare* NASA, FY 2023 BUDGET ESTIMATES (2022), *with* DEPT. OF THE ARMY, ARMY FISCAL YEAR 2023 BUDGET OVERVIEW (2022).

171. SMALL BUS. ADMIN., DEPARTMENT OF DEFENSE FY 2020 SMALL BUSINESS PROCUREMENT REPORT CARD I (2021).

172. James Fontana, *SBA's Mentor-Protégé See Some Welcome Changes and One Not So Welcome Change*, WASH. TECH. (Mar. 29, 2021), <https://washingtontechnology.com/opinion/2021/03/sbas-mentor-protege-sees-some-welcome-changes-and-one-not-so-welcome-change/355210> [<https://perma.cc/PE5B-MFBU>].

173. DILGER, *supra* note 63, at 7–8.

174. DFARS App. I-104(a).

175. *See id.*; 48 C.F.R. ch. 2, App I-109(d); DILGER, *supra* note 63, at 14 n. 87 (“The amount of such payments generally may not exceed \$1 million per year.”); *supra* discussion, at notes 104–12.

176. DEP'T OF DEF., OFF. OF THE SEC'Y OF DEF., DEPARTMENT OF DEFENSE FISCAL YEAR (FY) 2021 BUDGET ESTIMATES: DEFENSE WIDE JUSTIFICATION BOOK VOLUME I OF 2, FEBRUARY 2020, EXHIBIT P-40, BUDGET LINE-ITEM JUSTIFICATION: PB 2021, <https://comptroller.defense.gov>



#### 4. Changes to the Mentor-Protégé Program in the Space Acquisition Framework

Any potential changes to the DoD's MPP should be focused on increasing participation in the program. To increase participation, the USSF needs to make the benefits of participation attractive enough to convince large contractors that taking on new protégés is worth their time.<sup>177</sup> To that effect, the DoD's MPP should incorporate many of the changes made in the SBA's ASMPP.<sup>178</sup> In particular, the DoD should allow joint ventures between a mentor and protégé to compete for small business set-asides. Large businesses would likely be drawn by the opportunity to compete for and win new business, and, as a result, they would be more likely to enter into a mentor-protégé agreement.<sup>179</sup> The DoD should also allow joint ventures between a mentor and protégé to compete for SBIR/STTR contracts. A joint venture for a SBIR/STTR contract could help defray the costs associated with pursuing an award as the mentor would be able to help with proposal writing and production, concept development, and feasibility studies.

What's more, a mentor-protégé agreement could help pay for the costs of space qualification and bridge the gap over the "valley of death" between Phase II and Phase III.<sup>180</sup> Under the DoD's current MPP, a mentor would be able to seek reimbursement from the government for such developmental costs or receive credit towards its subcontracting goals.<sup>181</sup> Obviously, this type of support could be prohibitively expensive. As such, funding for the DoD's MPP must be increased to encourage and support the creation of new MPP agreements within the USSF. To that effect, the DoD should change its MPP so that mentors can receive reimbursement for developmental costs incurred up to \$2.5 million. Congress should also increase the amount appropriated to the DoD for the MPP from \$30 million to a number commensurate with the program's increased participation.

Finally, the DoD's MPP should be changed to specifically identify commercialization and commercial success as a type of assistance that can be provided by a mentor firm in USSF MPP agreements. To support this change, in addition to developmental costs, a mentor firm operating under an USSF MPP should also be able to receive credit towards applicable subcontracting goals based on a protégé's future commercial success. The USSF could measure this through "[a]n increase in the dollar value of contract and subcontract awards to protegee firms under . . . commercial contracts."<sup>182</sup> The amount

---

/Portals/45/Documents/defbudget/fy2021/budget\_justification/pdfs/02\_Procurement/PROC\_Vol1\_DW\_PROC\_PB21\_Justification\_Book\_Final.pdf [https://perma.cc/4W9P-YFGS].

177. Cf. Tillipman & Surampudi, *supra* note 170, at 219.

178. See W. Barron A. Avery et al., *Navigating the SBA's All Small Mentor-Protégé Program*, 52(2) *PROCUREMENT L.* 3–5 (2017).

179. Fontana, *supra* note 178.

180. See discussion *supra* notes 151–54.

181. DFARS App. I-109.

182. DFARS App. I-100(c)(1). This quotation modifies the DoD's current MPP policy statement so that commercial contracts are the primary focus of the proposed new standard for subcontracting goal credits.

of credit that the mentor can receive should be two times the total amount of those contracts attributable to assistance furnished by the mentor. This change would incentivize large contractors who have trouble meeting their subcontracting goals to provide a different type of assistance to proteges: commercial assistance.

This change would also increase overall participation in the program without requiring as much of an overall increase in the total amount appropriated to the program. Providing this type of credit is a win-win-win for the government, the mentor, and the protégé. While the mentor's investment is minimal, the small businesses would receive much needed assistance commercializing their products. The mentor has an incentive to help the small business succeed commercially, the small business would obviously benefit from commercial success, and the government benefits through the availability of more commercial products in the marketplace. These changes consider the new reality that, while small businesses might not be able to contract or subcontract with the government on space-related procurements, the USG can still help them find commercial success and benefit as a result.

These changes also ensure that the government is getting the maximum return on its investment in small businesses. However, one other critical and more fundamental change to the procurement system is necessary for the USSF acquisition system to actually accomplish its goals. The MPP and SBIR/STTR programs are potentially revolutionary because of their focus on and consideration of commercial success. Both identify commercialization and commercial contracts as measures of success. The USG needs to take that focus and apply it across the board to all small business procurement conducted by the USSF. The ultimate goal of every dollar spent by the USSF on small business programs should be to help small businesses succeed in the commercial space sector.

## VI. REDEFINING SUCCESS: HELPING SMALL BUSINESSES SUCCEED IN NEW SPACE

### *A. Dollar Spend and Proportion of Contracts in New Space Procurement*

While modernizing small business set-asides will certainly be helpful in the short term, it runs the risk of creating a false sense of security. It would be easy to see a resultant increase in dollars flowing to small businesses and assume that the programs are helping small businesses succeed. However, that assumption would largely miss the mark. The problem starts at the top.

Congress envisioned a procurement system which aims to “aid, counsel, assist, and protect . . . the interests of small[] business[es],” how?<sup>183</sup> By “insur[ing] that a *fair proportion of the [government’s] total purchases* and contracts or subcontracts . . . be placed with small[] business[es].”<sup>184</sup> FAR subpart

183. 15 U.S.C. § 631(a); see FAR 19.201.

184. FAR 19.201.

19.201 states that “[i]t is the policy of the Government to provide *maximum practicable opportunities* in its acquisitions to small business[es] [and] [s]uch concerns must also have the *maximum practicable opportunity to participate as subcontractors* in the contracts awarded by [the government].”<sup>185</sup> The FAR also envisions that each agency’s “Office of Small and Disadvantaged Business Utilization” will conduct reviews to ensure that small businesses are receiving “*a fair share* of Federal procurements.”<sup>186</sup> It mandates that the government “[e]ncourage prime contractors to subcontract with small business concerns.”<sup>187</sup> Prime contractors receiving contracts above the simplified acquisition threshold “must agree in the contract that small business[es] . . . will have the *maximum practicable opportunity to participate in contract performance* consistent with its efficient performance.”<sup>188</sup>

Unfortunately, Congress’s approach to measuring small business success has a fundamental flaw. It uses a short-term and superficial metric for success. The DoD and the SBA declare victory when at least 22.5% of prime contracting dollars and 32.25% of defense subcontracting dollars go to small businesses.<sup>189</sup> But they miss the actual effect that those dollars have on small business success and resultant effects on the U.S. supply chain. Relying on total dollars awarded to small businesses as a metric for success does nothing to ensure that small businesses are developing the skills and capabilities necessary to succeed outside of the closed market of government procurement. If the USSF shifts its focus to procuring commercial products and services, and small businesses have yet to create those commercial products and services, the result will be that small businesses are excluded from future space procurement. Unlike their large counterparts, small businesses need USG funds to develop the commercial space technologies the government seeks to procure.<sup>190</sup>

The products that are not procured commercially will likely be complex projects that only large contractors can handle,<sup>191</sup> or base operations contracts, janitorial contracts, and the like.<sup>192</sup> Unfortunately, most small businesses are likely unable to handle the massive undertaking of designing new major weapons systems for space or for creating new space-based technology for the

185. FAR 19.201(a).

186. FAR 19.201(c)(11)(i) (emphasis added).

187. FAR 19.202-1(d).

188. FAR 19.702 (emphasis added).

189. DEP’T OF DEF., *supra* note 71.

190. See discussion *supra* notes 104–06.

191. See, e.g., Sandra Erwin, *Military Space Gets Big Boost in Pentagon’s \$750 Billion Budget Plan*, SPACE NEWS (Mar. 31, 2019), <https://spacenews.com/militaryspace-gets-big-boost-in-pentagons-750-billion/> [<https://perma.cc/4XWY-A9UR>] (“[The] Air Force is requesting \$1.4 billion in RDT&E funds . . . includ[ing] \$817 million for the development of three Block 0 geosynchronous missile-warning satellites *being built by Lockheed Martin under a \$2.9 billion sole-source contract* . . . \$107 [billion] for two polar-orbiting satellites *to be made by Northrop Grumman* . . . \$264 million for ground systems and \$205 million for studies of future parts and material obsolescence.”) (emphasis added).

192. SECTION 809 REPORT, *supra* note 30, at 171, 174–75.

USSF.<sup>193</sup> While small firms should be involved in the development of major weapons systems as subcontractors, the USSF needs to look for different ways to support them. If small businesses receive fifteen percent of USSF procurement dollars, but all of those dollars go to relatively low-skilled service type contracts, small businesses are not better overall.

When Congress eventually calls on the USSF to award more contracts to small businesses and increase the percentage of USSF contracts that go to small businesses, it will be missing the point. While a small business may find great short-term success in the development of highly specialized widgets for a USSF weapons system, and the award of janitorial contracts will help increase the percentage of government dollars spent on small businesses, the effect of those dollars in the commercial sector is likely negligible. As the government shifts towards commercial solutions to problems in space, these types of contracts do nothing to develop and enhance the commercial space marketplace. The USSF needs to focus on how it can help small businesses create commercial solutions to space-related problems. If the USSF measures small business success based on total dollars spent and contracts awarded to small businesses, this will have the unintended effect of further increasing the reliance of space-related small businesses on government funds, and it will exclude potential new entrants in the commercial space sector. New space is commercial, so the success of USSF small-business programs should be measured in terms of commercial success.

### *B. Redefining Success: FAR*

Rather than focusing on “insur[ing] that a fair proportion of the [government’s] total [space-related] purchases” go to small businesses, it should be the priority of the government to ensure that space spending helps small businesses succeed in the commercial space market.<sup>194</sup> In the context of space procurement, “maximum practicable opportunities” should not be defined by a percentage of the government’s budget, nor by a percentage of the total contract awards made by the government.<sup>195</sup> “[A] fair share” of government contracts needs to be considered in light of not only current contract actions, but also potential future procurements.<sup>196</sup> It is in the USSF’s and small businesses’ best interests to ensure that small business government contractors find commercial success. Thus, USSF small business programs should not focus on providing maximum practicable opportunities within the closed market of government but should instead seek to provide the skills and support necessary for small businesses to be successful in the private and international

---

193. See *id.*; cf. John A. Welsh & Jerry F. White, *A Small Business Is Not a Little Big Business*, HARV. BUS. R. (July 1981), <https://hbr.org/1981/07/a-small-business-is-not-a-little-big-business> [<https://perma.cc/UA3N-FNN8>] (last visited Oct. 11, 2022) (noting that “external forces tend to have more impact on small businesses,” and “small businesses can seldom survive mistakes or misjudgments”).

194. 15 U.S.C. § 631(a).

195. See FAR 19.201.

196. See FAR 19.201(c)(11)(i).

sector. FAR Part 19 should be modified to that effect by including the following additional section:

FAR 19.201(e) - Facilitating Small Business Success in Space Procurement

- (a) It is the policy of the Government to provide small business concerns with an equitable opportunity to compete for space-related acquisitions.
- (b) For the purposes of space-related procurement, an equitable opportunity is characterized by the overall ability of small businesses to offer for sale to the general public their space-related products and services, after being awarded a contract or subcontract on a space-related procurement.
- (c) In order to facilitate small businesses being able to offer their goods as commercial items and services, it shall be the policy of the Government to use the SBIR/STTR and Mentor-Protégé programs to the maximum extent practicable on space-related procurement.
- (d) In order to ensure that small business concerns are receiving adequate support in commercializing products developed for the Government, annual reviews should be conducted to assess
  - (1) the extent to which small businesses are successful in the commercial space sector after being awarded a contract or subcontract on a space-related procurement
  - (2) as applicable, the extent to which small business are able to successfully market their products to foreign governments after being awarded a contract or subcontract on a space-related procurement; and
  - (3) the actions necessary to help small businesses find commercial success after being awarded a contract or subcontract on a space-related procurement.
- (e) An equitable opportunity for the purposes of space-related procurements shall not be exclusively characterized as a total percentage of space-related procurement funds allocated to small business concerns, nor by the total number of space-related procurements awarded to small business concerns.

### C. Redefining Success: SBIR/STTR

While the SBIR/STTR programs already promote the eventual commercialization of products developed by small businesses, the policy behind the SBIR/STTR statute should be updated to reflect the understanding that helping small businesses in space-related government contracting means helping them find commercial success. This effort can be done by amending the last line in 15 U.S.C. § 638(a) to state: “It is the policy of the Congress that assistance be given to small-business concerns to enable them to undertake and to obtain the benefits of research and development,” *and to ensure that they have a reasonable opportunity, and the assistance necessary, to offer for sale to the public, the results of such research and development* “in order to maintain and strengthen the competitive free enterprise system and the national economy.”<sup>197</sup> A similar

---

197. Adapted from 15 U.S.C. § 638(a).

provision should be added to the DoD Instruction (DoDI 5000.02) for the USSF which identifies the primary focus of the program as the creation of new commercial technologies and strengthening of the commercial space sector.<sup>198</sup> Because commercialization is already the primary goal of the SBIR/STTR programs, major changes to the programs are not needed outside of the improvements mentioned in the prior section.<sup>199</sup>

#### *D. Redefining Success: The DoD's Mentor-Protégé Program*

The DoD and the USSF should also refocus the DoD MPP to ensure that commercialization and future commercial success are the primary goals of the program. Instead of encouraging small businesses to grow in a closed market that will eventually run dry, the USSF must create MPPs that emphasize and prioritize commercialization. The DoD currently measures the success of its MPP based on

(1) increase[s] in the *dollar value* of contract and subcontract awards to protege firms (under DoD contracts, contracts awarded by other Federal agencies, and commercial contracts) from the date of their entry into the Program until 2 years after the conclusion of the agreement; (2) increase[s] in the *number and dollar value* of subcontracts awarded to a protege firm (or former protege firm) by its mentor firm (or former mentor firm); and (3) an increase in the employment level of protege firms from the date of entry into the Program until 2 years after the completion of the agreement.<sup>200</sup>

While the program nominally contemplates commercial success, the DFARS (or Space Force Federal Acquisition Regulation Supplement, when released) should make a protégé's commercial success the primary goal of mentor-protégé agreements administered by the USSF. While DoD contracts and other federal contracts are important, focusing on—and specifically identifying—commercial success as an independent criterion for success highlights the new reality that space-related procurement is commercial. This goal could be done by amending the regulation so that the first metric for program success is as follows:

the development of new commercial items and services made available or offered for sale to the public by the protégé firm; an increase in the total number of commercial sales or contracts by the protégé firm; or an increase in total sales to foreign governments by the protégé firm.

MPP agreements should be leveraged so that small businesses can be successful in the commercial space sector. Anything less means that they will eventually miss out on the benefit of USG spending on space as the USSF shifts to an acquisition system driven by commercial products and services. These changes highlight the importance of small business success to space

198. See DEPT. OF DEF., DoD INSTRUCTION 5000.02: OPERATION OF THE ADAPTIVE ACQUISITION FRAMEWORK (2022).

199. See discussion *supra* notes 150–67.

200. DFARS App. I-100(c).

procurement and acknowledge the reality that the best way for the government to help small businesses succeed in space is to help them find commercial success.

## VII. CONCLUSION

The commercial space sector is expected to grow to over \$1 trillion by 2040.<sup>201</sup> The USG should be doing everything it can to help position small businesses to take advantage of this market. Unfortunately, small businesses have failed to keep pace with their large counterparts when it comes to finding success in developing commercial space technologies.<sup>202</sup> And they risk being unable to compete in the global commercial space sector at all. While the solutions presented in this Note appear simple, their effect will be tremendous. Each of the suggested solutions can be implemented alone or in conjunction with one another for maximum practicable effect. At a minimum, the USSF should refocus its acquisition system in light of the fact that small business success in space is not defined by total USG contracts or percentage of intramural budgets, but rather by a firm's success in the commercial sector. Implementing the changes above are the first step in making the USSF's goal of space superiority a reality.

---

201. *Space: Investing in the Final Frontier*, <https://www.morganstanley.com/ideas/investing-in-space>, MORGAN STANLEY (July 24, 2020) [<https://perma.cc/99XA-VSFN>].

202. BUREAU OF INDUS. & SEC., *supra* note 9, at 46 ("Non-small business commercial respondents increased these sales by 37 percent [\$5.5 billion] . . . while small businesses saw their non-U.S. commercial sales increase six percent [\$133 million].").