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NAVAL POSTGRADUATE SCHOOL

# VCs as Transition Partners: Leveraging Networks and Expertise to Improve Fielding Outcomes

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## Abstract

Venture capital (VC) firms focused on the defense market investments should serve as transition partners with their portfolio companies helping them identify potential defense customers, overcome integration challenges, and scale in advance of demand to improve fielding outcomes just as commercial-focused VC firms assist their portfolio companies with entering new markets, finding additional funding, and connecting with key industry players. Over the years, the DoD created multiple Service innovation organizations to support the identification and maturation of emerging commercial technologies. However, the reported transition rates of commercial technology into programs of record appears to be incredibly low despite the efforts of multiple government offices. The DoD recently created the Office of Strategic Capital to more squarely focus on leveraging private investment capital to meet defense customer requirements. Even still, VC firms find the DoD marketplace challenging to navigate. For VC firms to fully exploit their private investments, and to benefit national security, defense-oriented VC firms must transform their commercial-focused investment best practices into defense focused business engagement models that extend beyond raising capital.

## Introduction

With venture capital (VC) in defense technology increasing dramatically in the last 10 years, there should be demonstrable improvements in joint force capabilities as commercial innovation rapidly addresses unmet capability gaps. Yet, Department of Defense (DoD) procurement of technology backed by VC has remained roughly the same (percentage-wise) as it was in 2013 when investments in defense tech were minimal. The failure of companies using venture capital funds to successfully garner substantial contracts is often, unfairly, levied only at the DoD. Regardless, the DoD is at risk of losing this relatively new source of innovation funding.

This novel paper explores the potential role that VCs might have in extending their services to portfolio companies beyond just financial backing but becoming active partners in assisting companies navigate the DoD bureaucracy and successfully scale. For context, this paper provides a primer on venture capital, identifies trends in defense focused venture capital and resulting DoD contracts. It also offers an in-depth description of the services VCs provide and how those services might be tailored for defense. Finally, it offers actionable steps for VCs in the defense space to become a transition partner with startup founders, the DoD, broader industry, and Congress.



## Venture Capital

Venture capital is a type of financing that investors provide to startup companies and small businesses in different stages of maturity that are viewed as having high growth potential. The funds to support venture capital efforts come from private investors, investment banks, and financial institutions (Hayes, 2024). In return for investments, VCs usually form a limited partnership with the respective business and share in any profits or losses with VC liabilities only up to the level of investment made (Tarver, 2023).

VC firms usually take ownership stakes of less than 50%, invest in a wide variety of companies, will group with other VC firms, and have little to no management control in the day-to-day operations of the company (although they may have board seats; Baldrige, 2023). For distinction, VC is a form of private equity (PE) but is different than private equity strategies exercised by PE firms like Blackstone and The Carlyle Group. Those PE firms are focused on a smaller subset of mature companies, they take a full ownership stake, and have broad management control to streamline operations and exit their investment as they choose (Team, 2024).

VC firms meanwhile have varied investment strategies with some focused on earlier-stage startups that may only have a prototype and others who are more focused on scaling a promising technology that has a demonstrated market fit. While most VCs will not acquire a controlling interest like a PE firm, there are different strategies that can be employed. VCs focused on later-stage investments will want at least a 10%–15% stake while those in the earlier stages are willing to take a much smaller share commensurate with their lower investment (SVB, n.d.). These different entry points provide support for companies to undertake different business activities and impacts the VC investment return expectations (see Table 1; Orn, 2024). In 2023, 70% of deals were considered early-stage with mid and late-stage equaling 18% (CB Insights, 2023).

**Table 1. Stages of VC Investment and Expected Return**

| <b>Stage</b> | <b>Business Activity</b>                              | <b>Expected Return</b> |
|--------------|---|------------------------|
| Seed         | Building a Prototype; Business Startup                | 100X                   |
| Series A     | Marketing; Revenue Generation; Plan to Scale          | 10–15X                 |
| Series B     | Commercial Viability; Scaling Production and Sales    | 5–10X                  |
| Series C+    | New Products and Markets; New Customers; Acquisitions | 3–5X                   |

There are tradeoffs for companies accepting VC funds. Investors may require a large share of equity that dilutes the founder’s ownership, company leadership may lose creative control if investors press for faster returns; and founders may be forced to choose a non-preferred exit strategy that sacrifices long-term growth goals (Thangavelu, 2023). Exit strategies may include acquisition from another company, an initial public offering, liquidation of the company; or stock buybacks (Guest, 2022). The downsides of accepting VC funds are what makes grants from the Small Business Innovation Research (SBIR) program attractive to investors—the funding is nondilutive and the government never gets directly involved in operations (SBA, n.d.).

The United States pioneered the VC model with the establishment of the American Research and Development Corporation in 1946 and access to capital is considered a key reason why the United States leads the world in entrepreneurship and innovation.



Entrepreneurs need funding and support to transform their ideas into viable businesses and the United States offers a robust financial infrastructure, with venture capital firms, angel investors, and well-developed capital markets (Calimano, 2023). McKinsey & Company, in their Playbook for Innovation Hubs and Ecosystems have “*Capital and Funding*” as number 3 on their list of key actions for building a robust innovation ecosystem (Davis et al., 2023).

In 2015, public companies that received VC backing accounted for 20% of the market capitalization and 44% of the R&D spending of U.S. public companies (Gompers et al., 2021). Over the last decade, venture investing has grown significantly, with the value of deal investment growing five times from 2009 to 2019, and the number of deals doubling (Figure 1; Gabbert, 2020). Median deal size for earlier-stage companies is at an all-time high (Figure 2) and Q4 of 2023 was extremely active indicating ample opportunities for aspiring companies (Stanford, 2023).

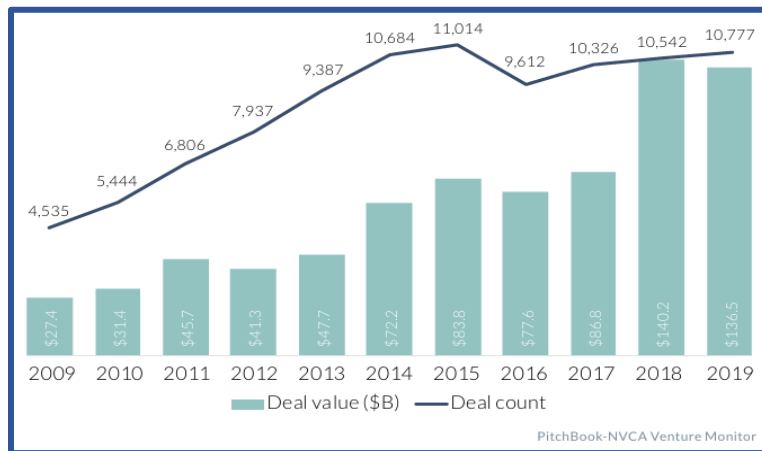


Figure 1. U.S. VC Deal Activity

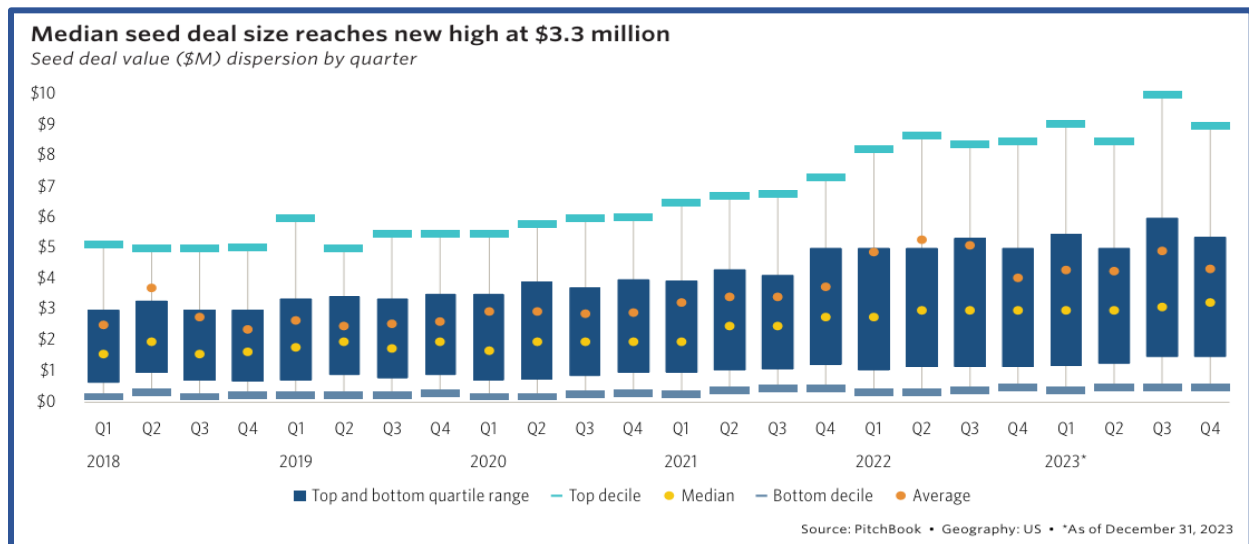


Figure 2. Median Seed Deal Size

### VC Shift to Defense Market

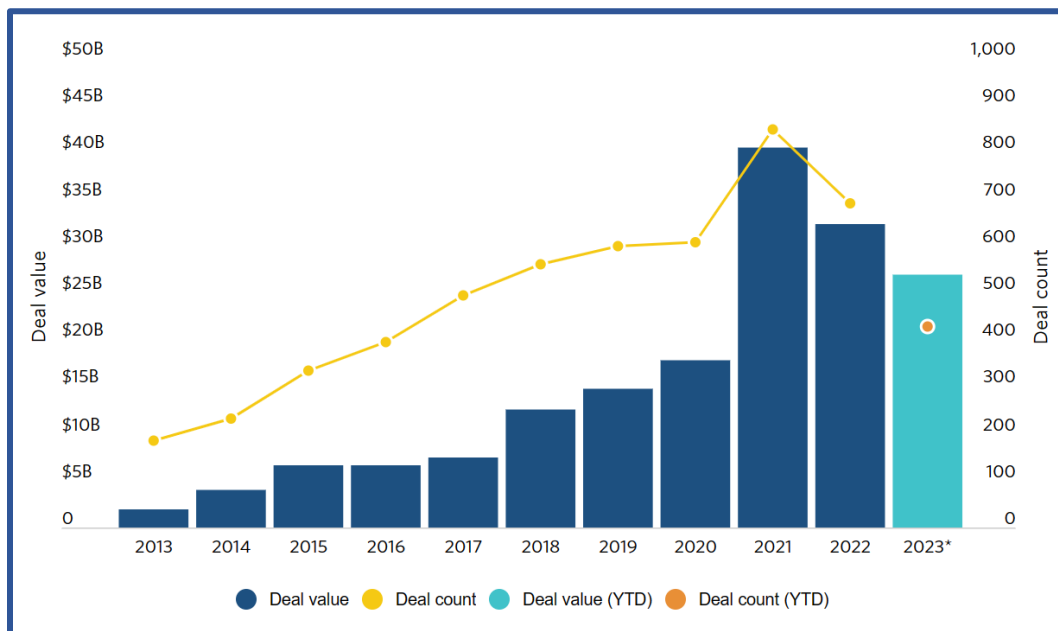
For the last two decades, the United States has been focused on conflicts where the adversary had inferior capabilities and where current military capabilities were sufficient for the



missions undertaken. In recent years, however, there has been substantial literature on how unprepared the United States and allied defense establishments are for a global and protracted conflict with a peer adversary. The Ukraine-Russian conflict has been demonstrative of how legacy systems designed for the Cold War can be compromised in the face of new high-tech systems such as proliferated satellite networks and artificial intelligence as well as high mass, low-cost drone manufacturing that can target capital assets like ships, tanks, and advanced aircraft.

The DoD’s willingness to consider new technology that is not exclusively developed by large defense primes created an opening for dual-use commercial companies to potentially gain a share of the large defense market. Innovation hubs like AFWERX and Defense Innovation Unit (DIU) have also increased expectations for aspiring startups by providing a new level of government to industry engagement not previously seen from the defense enterprise. Defense Secretary Ash Carter envisioned this very scenario when creating DIU. Former Deputy Secretary of Defense Bob Work described DIU as the DoD’s effort to create a “beachhead in Silicon Valley” (Albon, 2023). The success of companies such as SpaceX, Anduril, Palantir, Shield AI, Hawkeye 360, Rebellion Defense, Skydio, and Epirus (all defense tech unicorns) have also demonstrated that large-scale success is possible in defense even if the path was not always easy (Temkin, 2023).

Silicon Valley has responded to this outreach by expanding VC investment in the defense-tech sector. Rapid growth was seen from 2016 to 2022 with \$135.3 billion invested across 4,744 deals. Investors expect this trend to grow to \$184.7 billion by 2027, “driven by the government’s growing demand for innovative dual-use technologies to meet its national security goals” (Figure 3; Javaheri, 2023). The leading startup accelerator, Y Combinator recently jumped into the defense space on the heels of other prominent VC firms such as Sequoia, Bessemer Venture Partners Andreessen Horowitz’s a16z (Alamalhodaie, 2024).



**Figure 3. VC Activity in Defense Technology**

Given the initial focus on dual-use technology, this jump in interest may not seem as significant for meeting defense-specific needs, but in recent years VC investments have expanded beyond just artificial intelligence, space launch, and space imagery into more kinetic



domains that have less dual-use applicability. As Mike Brown, a partner at Shield Capital and former director of DIU noted, “We are seeing more VCs saying they are comfortable investing in start-ups doing . . . tech that can have a kinetic effect used purely for the military” (Kinder, 2023). Palmer Luckey, founder of Anduril, went even further saying, “We want to build the capabilities that give us the ability to swiftly win any war we are forced to enter” (Thompson, 2024). This expanded view has led Anduril to make significant investments in loitering munitions, such as the Altius, and for leading investors such as Founders Fund, Andreessen Horowitz, General Catalyst, 8VC, and Lux Capital to be willing to make serious bets on those military-centric capabilities (Martin, 2022). Further diversity of investment is demonstrated with the varying portfolios of the 10 most active VC investors in defense and aerospace technology (see Figure 4; Robbins, 2023).

| VC Firm             | Focus   | Median Deal Size | Portfolio Companies            |
|---------------------|---|------------------|--------------------------------|
| Soma Capital        | Satellite imagery, hydrogen fuel jets and broad portfolio | \$4M             | Albedo, Destinus               |
| SpaceFund           | Reusable satellites, aerospace refueling                  | \$8.5M           | Space Forge, Axiom Space       |
| Alumni Ventures     | Drones and air defense                                    | \$29.2M          | Red 6, SkySafe                 |
| Space Capital       | Intelligence payloads                                     | \$77.5M          | Iceye, Impulse Space           |
| Seraphim Space      | Drones, satellite imagery and aerospace launch            | \$18.6M          | Nightingale Security, Edgybees |
| Gaingels            | Smart gun tech, drone defense and AI services             | \$15.6M          | Shield AI, Biofire Group       |
| Founders Fund       | AI and augmented reality                                  | \$43.6M          | Anduril, Biofire Group         |
| Hemisphere Ventures | Communication, drones, intelligence and refueling.        | \$12.8M          | Skyfront, Nightingale Security |
| Draper Associates   | Aerial intelligence, smart gun tech and drones.           | \$8.1M           | Biofire Group, Natilus         |
| Liquid 2 Ventures   | Satellite intelligence                                    | \$10M            | Anduril, Prenav                |

**Figure 4. VC Activity in Defense Technology**

Given the factors highlighted, there are now numerous what might be termed “defense-involved” VC firms, which means they have and are making serious bets on the defense sector (Figure 5).

|                 |                         |                  |                        |
|-----------------|-------------------------|------------------|------------------------|
| Lux Capital     | Marque Ventures         | Decisive Point   | Iron Gate Advisors     |
| RIOT            | Refinery Ventures       | Squadra          | Scout Ventures         |
| A16z            | Snowpoint Ventures      | Shield Capital   | Insight Partners       |
| Founders Fund   | America’s Frontier Fund | USIT             | Moonshots Capital      |
| 8VC             | Point 72 Ventures       | Sequoia          | General Catalyst       |
| Space Capital   | Acorn Growth Companies  | Cubit Capital    | Generation Space       |
| Silent Ventures | GulaTech Adventures     | Red Cell         | Roadrunner Venture     |
| Vision Fund     | Accel Partners          | Prosus Ventures  | Champion Hill Ventures |
| Techstars       | SoftBank Vision Fund    | The Veteran Fund | Pallas Ventures        |

**Figure 5. VC “Defense-Involved” Firms**





The VC arena has become so attractive that even large defense primes are entering the game. Lockheed Martin established Lockheed Martin Ventures with 16 different focus areas and \$200 million in investments across 35 companies (Lockheed Martin, 2024). Boeing established AE Industrial Partners (ae HorizonX) with five primary focus areas and investments in 29 platform companies (AE Industrial Partners, 2024). RTX established RTX Ventures with a focus in four areas and an undisclosed portfolio that includes promising companies such as EpiSci, Hermeus, Impulse Space, Neural Propulsion Systems and H55 (RTX, 2024). Booz, Allen, Hamilton initiated Booz Allen Ventures with a focus on Joint All Domain Command and Control technologies and have invested in at least nine companies in that space (Booz, Allen, Hamilton, 2024). L3Harris Technologies uniquely formed a strategic partnership with VC firm Shield Capital (L3Harris, 2022).

### Defense Challenges for Startups

Even with the increased investments over the past 10 years, the creation of new defense-tech startups and expressed interest from DoD leadership, the military has not taken advantage of the private capital flowing into the defense space. While there have been some isolated, decently sized contracts to some of the larger non-traditionals, in FY23, venture-backed companies were awarded less than 1% of the total awarded DoD contracts (according to data collected by Govini) which is roughly the same margin as 2010 when venture investment in defense was minimal (Figure 6; Somerville, 2024).

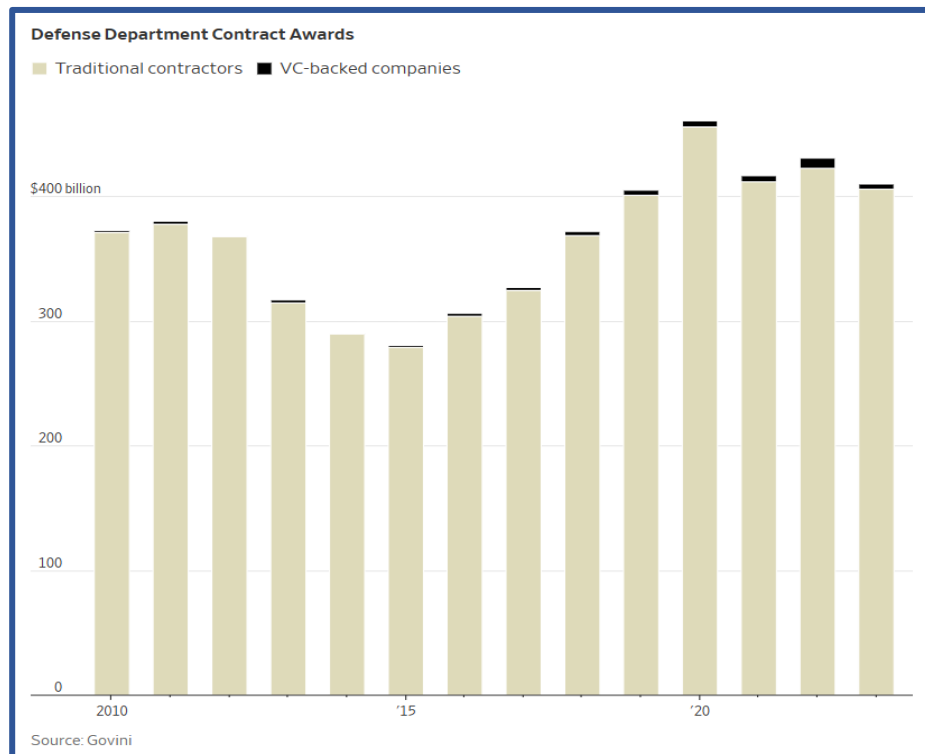


Figure 6. DoD Contract Awards and Share of VC-Backed Companies

There is no shortage of challenges for defense startups to penetrate the DoD market. One investor aptly summarized the problem as “risk aversion, bureaucracy, red tape, heavy regulation, and a culture that values the status quo over change are stalling the pace of innovation” (Yakulis, 2023). A major one is funding timelines. DoD budget cycles and acquisition processes take years to build a new program into the long-term resourcing plan, while startups





are operating on very lean budgets with often little margin. Venture funding may only be available for a one-to-two-year window leaving startups with a critical gap (often referred to as the valley of death) between when a product may be available for purchase and when the DoD would have the funds and approvals to begin procurement. This gap makes it harder for startups to continue to raise funds as military commitments are hard to predict until they are placed on contract. As one VC put it, “if a technology is not in a program of record with a budget line item, that is an Achilles heel to the entire commercial integration effort where we put years of effort, and nothing comes out of it” (Erwin, 2023).

While Small Business Innovation Research (SBIR) funding can be helpful for many companies, it is a poor substitute for substantial and recurring revenue streams. It is critical for defense-involved startups to have technologies that are formalized into the acquisition system and have a programmed budget line. One startup founder compared getting a new technology into the DoD’s budget as a “Field of Dreams,” so this is no easy task given the DoD’s numerous priorities (Somerville, 2024).

Another key challenge that constrains the application of innovative commercial technology to military problems is the requirements process that underpins the creation of any long-term acquisition program. The DoD is notorious for requiring large, multi-mission and exquisite solutions to problems that few startups would have the expertise, security clearances, or certifications to win the contract for or to successfully complete the work. This is compounded by the dictation of specific components or subsystems in highly detailed specifications that often preclude alternative solutions (Erwin, 2023). This is the reason why defense primes have dominated defense procurement over the many decades. There has been progress in the various innovation shops using novel requirements approaches and streamlined contracting vehicles (Toliver, 2022). However, as some studies have noted, the “DoD has effectively divorced defense innovation from defense procurement [by] detaching the development of cutting-edge capabilities from the production of major systems and platforms” and created a system of “innovation tourism” where innovation offices lack the financial resources necessary to drive wholesale modernization across the DoD (Flagg & Corrigan, 2021). This is a challenge that startups need help in overcoming to effectively sell their products and potentially a challenge that VCs can help the DoD overcome.

Deputy Defense Secretary Kathleen Hicks rightly characterized the most looming challenge for startups when she said, “I think transition clearly is one of our biggest problems [with] the so-called ‘Valley of Death,’ scaling up to fielding and full-scale production” (Metzger, 2023). As one CEO noted, “Program managers are not necessarily incentivized to bring in cutting-edge innovation . . . their duty is to deliver cost, schedule and performance on those programs of record, which are tied to a congressional budget line” (Erwin, 2023). A recent Reagan Foundation report noted that the government is failing to transition SBIR contracts to production with even the top 25 awardees generating a tiny fraction of revenue from follow-on Phase III contracts (Zakheim, 2024). The reality is that not all commercial technology is easily assimilated into warfighting capabilities as the military has become accustomed to procuring and fielding integrated platforms. This means that careful planning is needed when deciding the best approach for selling a product to the DoD. A new sensor may be game-changing, but it may need to be integrated into an existing system to be of use to military forces. A new analytics tool may be more powerful than any other DoD capability, but it faces the reality of having to replace a product that has already been scaled to thousands of military users. A new application may have superior functionality, but it has not undergone the security testing of other products and may not be immediately fieldable on an operational network. New commercial space services may be able to provide better coverage and resolution than existing military satellites, but program offices may not know how to contract for different business models and



operational users may not understand how to integrate the commercial capability across different classification domains. While there have been notable changes to statute, regulations, and policies requiring program managers to embrace commercial standards for open systems that would make this an easier process, challenges remain in achieving seamless integration of cutting edge solutions.

Requirements, funding, and transition (RFT or RIFT) barriers are all substantial but can be overcome with the right application of technology, appropriate planning, user engagement and advocacy building. There are examples of the innovation ecosystem breaking through the legacy approaches that go to the same vendors for solutions (McNamara et al., 2023). Unfortunately, it is not happening at the rate needed to sustain the capital market investments long-term. Even when former military officers, like Even Rogers of True Anomaly have tried to convey to DoD decision makers that “venture capital will fund the hard stuff, building prototypes and testing,” the DoD has yet to reward that behavior at scale by buying the finished products that they say they need. Tara Murphy Dougherty, chief executive of Govini, characterizes the situation as risky with “venture looking at the defense market as a failed experiment.” Mike Brown has commented that without a shift in the concentration of contracts going to these new, innovative startups, the “VC investment will dry up” (Somerville, 2024).

## Founder Support

Venture capital is sometimes viewed as merely financial resourcing. While financial capital is highly important for startups to hire top talent, make key investments, produce high-quality products, and evolve their product line, VC support also comes as technical or managerial expertise. This expertise can be viewed as different forms of capital, namely “intellectual capital” and “relationship capital” (Chan, 2007).

Intellectual capital can be comprised of services such as human resources, sales, negotiation, marketing, branding, pitch, design, and manufacturing expertise along with coaching, mentorship, and executive support to a founder from an experienced hand in that business sector. One VC firm, MGCV, makes sales expertise a core part of their offering and supports founders “through every step of becoming a master of sales—everything from which digital systems to use to in-person pitch practice” (Schroder, 2021). One forward-leaning VC firm even connects its startup founders “with wellness and personal development services, like executive coaching, sleep support, peer groups, team coaching, therapy, nutritionists, and culture building” (Graumann, 2023).

Relationship capital is more focused on leveraging a VC’s extensive networks to support continued fundraising, help with recruitment of experienced board members and senior employees, navigate complex regulatory environments, and facilitate introductions to potentially strategic clients. One VC partner noted, “that it can’t be overstated how helpful it is to have investors provide operational support, facilitate connections to prospective clients or give guidance on expanding into regional markets” (Schroder, 2021).

The strategic relationships element might be the most critical offering a VC can provide given the downstream ramifications and why it is important for that firm to have experience in the same domain. For instance, a pharmaceutical startup would be taking a greater risk partnering with a VC who has only invested in the AI space since they may not have the necessary connections to help accelerate a drug approval, be connected with the right universities to run a trial, or get prioritization for drug manufacturing (Zapflow, 2022). This is why its key for startup companies to understand their strengths and weaknesses when choosing a VC partner to make sure they add value in helping to grow and scale the business (Schroder, 2021). This is also why the relationship between a company and an investor should not end



after a financial investment has been made but rather serve as the beginning of a relationship (Yakulis, 2023).

In the defense VC space, this approach may even be more critical given the RIFT barriers, identified earlier, that the current defense acquisition imposes on startups. As Philip Bilden, a managing partner at Shield Capital noted, “You’ve got to have very specialized skills and capabilities to actually make money [investing in the defense sector]—you don’t just do this as a generalist” (Temkin, 2023). This also means that defense-involved VCs with smaller portfolios may be the best relationship partners given they can provide the focused support that is needed to navigate the maze of DoD stakeholders, get visibility on the startup’s offering, and work towards establishing them as a formal acquisition program. One successful investor noted that when he is actively involved in his portfolio companies, he more routinely achieves a return of 70%, whereas when he acts as a passive investor, success drops closer to 10% (Chan, 2007).

This type of hands-on engagement is critical as many startup companies may not understand the many nuances of how systems are fielded in the DoD, the various user groups that need to be engaged, the advocacy networks that need to be established, the processes that need to be navigated, and the approvals that need be garnered. The term “founder friendly” is used in the VC space and there are even advisory firms that propose using a Venture Capital Net Promoter Score “that incorporates feedback from startups and entrepreneurs in its portfolio to provide a more well-rounded picture of a VC firm’s success, beyond just its financial performance” (Graumann, 2023). This approach could be tailored to assess a VC’s “defense friendliness” and their ability to provide services that are necessary to achieve success in the defense space.

There is no standard template for venture capital services to startup companies. Each VC adopts their own unique approach based on their goals and investment strategy. An extensive survey of VC websites and media, combined with targeted interviews with experienced investors, informed the development of the Matrix of VC Services (Figure 7). While this is by no means exhaustive, it attempts to characterize the different offerings that a VC might provide to an aspiring startup in the commercial space. Even defense-involved VCs (as we are terming them) will, in most cases, have commercial aspirations so there is considerable overlap among the startup services that a “defense-involved” VC might offer (Figure 8).

|                         |                      |
|-------------------------|----------------------|
| Strategic Relationships | Product & Technology |
| Client Introduction     | Operations           |
| Branding/PR             | Coaching/Mentoring   |
| Sales & Marketing       | Human Resources      |
| Strategy Development    | Recruitment          |
| Sector Expertise        | Finance & Admin      |
| Legal / Regulatory      | Investor Connections |
| Engineering Assistance  |                      |

**Figure 7. Matrix of VC Services**

While teaming arrangements certainly occur among commercial companies, in the defense context, this refers to teaming on government contracts where a larger company can provide the capital infrastructure and fielding expertise while the smaller startup provides more innovative or more cost-effective solutions. A good example of this is Lockheed Martin’s teaming with Terran Orbital on the Space Development Agency’s Transport Layer Tranche 2



constellation where Terran provided satellite buses developed using advanced manufacturing processes that were produced with shorter lead times and at lower cost (Terran Orbital, 2023). Booz Allen Ventures specifically advertises helping portfolio companies find “subcontracting opportunities [and] proposing teaming agreements for proposals” (Booz, Allen, Hamilton, 2024). The agreement that Shield Capital and L3Harris signed is premised on L3 gaining access “to disruptive innovators for technology transfer, teaming arrangements, direct investments, or potential acquisitions and partnered contracts” (L3Harris, 2022). The Army has even taken steps to incentivize this type of teaming, so VC’s that can provide this service may be opening a pathway for easier entry to large DoD contracts, provided the partnership is structured equitably (Judson, 2023).

| VC Services                    | Comparable Defense-Involved VC Services  |
|--------------------------------|--|
| <b>Strategic Relationships</b> | <b>Government Relations:</b> Providing access to or representing the interests of the portfolio companies with key stakeholders at the federal and state levels.   |
| <b>Client Introduction</b>     | <b>Teaming Agreements:</b> Teaming either as equal partners or in a subcontractor role to satisfy the needs of a government contract.  |
| <b>Branding/PR</b>             | <b>HQ/ PEO/ PM Advocacy:</b> Facilitating access to key stakeholders with influence on resourcing decisions and acquisition leaders with influence over acquisition and contracting strategies             |
| <b>Sales &amp; Marketing</b>   | <b>User Engagement:</b> Engaging with appropriate user groups to bring awareness to the capability’s potential and garner feedback on specific features and overall feasibility for operations.            |
| <b>Strategy Development</b>    | <b>Acquisition / Contracting:</b> Aiding planning and execution of acquisition strategies and contractual arrangements acceptable to the startup’s founder/board as well as to the government.             |
| <b>Sector Expertise</b>        | <b>Defense Primer:</b> Explaining nuances of the defense system and various forces at play that impact the ability to garner a contract.   |
| <b>Legal / Regulatory</b>      | <b>Compliance:</b> Supporting efforts to ensure the startup’s product meets export, security, cyber, and assurance requirements.   |
| <b>Engineering Assistance</b>  | <b>Integration / Fielding:</b> Enabling the seamless integration and/or accelerated fielding of the startup’s product with expertise and infrastructure needed to reduce any barriers to government sales. |

Figure 8. Matrix of Comparable Defense-Involved VC Services

Government relations is another service that defense-involved VCs can recommend to their portfolio companies. The congressional lobbying spend from the larger non-traditional defense unicorns like SpaceX, Anduril, and Shield AI, which exceeded \$5.7 billion in 2023, is indicative of how important this function is to be a major player in both defense authorization and appropriations. Only a handful of defense-involved VCs retain government relations support, although Andreessen Horowitz’s VC firm, a16z, recently activated an internal lobbying shop for the defense-oriented companies in its portfolio (Edgerton & Chapman, 2024).

Government relations, or lobbying Congress, is not only advocating for increased funding in targeted areas but also engaging in conversations about setting the conditions for real, sustainable change. This advocacy often starts with changes to statute, regulations, and policies that may be favorable to a portfolio company’s technology. VCs currently advocate on



technology public policy but there is an opportunity to expand that outreach to defense acquisition reforms and industrial base policies favorable to small businesses and non-traditional defense contractors. Government relations also includes considering federal and state relationships with elected officials and their administrations. Eric Snelgrove, the founder of Revere Federal Strategies, a government relations firm that specializes in representing VC-backed defense technology startups, recommends VCs and their portfolio companies consider government relations in every business decision, to include where to locate the company's headquarters, when to pursue non-dilutive research and development funds, and when to start building champions in Congress (Snelgrove, 2024). A VC firm offering this type of government relations education and support, either directly or through external representation, would be elevating the odds of transition success.

Access to key government stakeholders at the headquarters, program office, and user levels is another valuable service that VCs can provide to portfolio companies. This is especially key for early-stage startups who may have founders who have never engaged with the military and need coaching on how to present the product as well as who should be engaged. The use of SBIR contracts to gain access to users and refine the product is useful but not a substitute for a full-throated engagement campaign. It borders on being an art form to understand the different stakeholders across the DoD that can be useful touchpoints. This includes understanding the different user bases, whether it is those individuals at the operational edge, those in the testing community, those users in planning roles, or those in programming who can directly influence the budget. At the acquisition level, it is important to know who the right leaders are and when to engage a program executive officer or program manager rather than engage with the engineering leaders on the program. The capability to navigate this stakeholder maze is a critical service that can set an aspiring startup on the path to long-term contracts or relegate them to obscurity.

Expertise in government processes, specifically acquisition and contracting ones, is another important service VCs can provide. VCs leverage defense accelerators that provide education and make connections. Techstars for instance has a comprehensive accelerator program that it uses for its portfolio companies (Techstars, 2024). In most cases however, that exposure is limited, and accelerators serve many customers which can diffuse the value of more targeted expertise. The managing partner of AE Industrial Partners, Kirk Konert, sees it as an important offering from his firm to help startups to “navigate through regulations and acquisition hurdles, making sure they can seamlessly fit within existing operating systems and ensuring they never compromise on security” (Konert, 2024). Raj Shah, partner at Shield Capital, sees it as important for companies entering the national security market to have “a venture partner who is fluent in government, including acquisition cycles, deciphering operational needs, and challenges” which is clearly a priority for his firm as they have deep expertise among both their advisors, partners and broader team (Alamalhodaie, 2023). Decisive Point advertises expertise “in using rapid acquisition authorities, executing government contracts, providing guidance on government relations, and opening access to deep relationships across the deep-tech ecosystem” (Decisive Point, 2024). This an important offering as many startups have challenges knowing where to access government opportunities and what proposals are worth allocating valuable time pursuing. Time is money anywhere, but is especially important in a resource-constrained startup environment.

In the area of integration and fielding expertise, the defense prime VCs may be the most uniquely poised to provide this service given their experience and vast enterprises. Lockheed Martin (LM) Ventures advertises that it provides portfolio companies access to “our world-class engineering talent, state-of-the-art technologies . . . and supply chains” (Lockheed Martin, 2024). This was evidenced by a strategic partnership with the startup Regent, where the CEO





noted that it planned to leverage LM's expertise to "adapt sea gliders for defense use cases" (Regent, 2023). Booz Allen Ventures boasts that it help startups accelerate the necessary security requirements to get an Authority to Operate or satisfy requirements under the Federal Risk and Authorization Management Program (Booz, Allen, Hamilton, 2024). AE Industrial Partners touts their ability to help startups solve technical challenges and navigate regulatory environments (AE Industrial Partners, 2024). RTX Ventures provides "access to our global network of more than 60,000 engineers [and] connectivity to 10 enterprise wide capability development centers" (RTX, 2024). VCs that are not embedded in a defense prime can pursue partnerships similar to the one previously mentioned between Shield Capital and L3Harris (L3Harris, 2022). Defense prime VCs are also not the only firms to offer these services, but the level of specific expertise and historical exposure to challenges in fielding military products should make this service attractive for certain startups and should increase the odds of a successful transition.

Defense-involved VCs had been using the Defense Ventures Fellows program to gain access to expertise in these defense areas, but that program was recently cancelled. As Shyam Sankar, the CTO of Palantir, noted the program was an "institution that's had an outsized impact in providing the connective tissue between America's greatest entrepreneurial innovators, and the innovators within defense" (Jeans, 2024). The transfer of investor and technology expertise back to the DoD was also highly impactful as participants noted that it changed their perspective and made them better acquisition professionals. Reinstating this program or one similar should be a priority for those in defense acquisition leadership roles.

The takeaway from this broad assessment should not be that the VCs in the defense space are mostly disengaged investors who have no experience in managing these defense complexities. It is abundantly clear that many have significant expertise in leadership, advisory boards and staff that can provide value in these defense areas. It is also likely that many engage consultants to provide insight where they have gaps in skillsets. It is also likely that most are "founder friendly" and highly engaged. A Harvard study that surveyed nearly 900 VCs found that most VCs are active advisors with 88% reporting that they "interact substantially" at least once a week and that they provide substantial post-investment services including strategic guidance (87%), connections to other investors (72%), connections to customers (69%), operational guidance (65%), help hiring board members (58%), and help hiring employees (46%; Gompers et al., 2021).

The primary takeaway from this assessment should be that there is not clear visibility into the services that different VCs provide to help startups with aspirations to provide solutions to DoD problems and the effectiveness of those offerings. This would not normally be the government's concern except for the fact that VCs are playing an increasingly important and interconnected role in bringing cost-effective and innovative solutions into the DoD. The Air Force's AFWERX organization was the first to recognize the value of private capital as part of its Prime and TACFI/STRATFI programs. To date, they have garnered a 12:1 ratio of private funding to SBIR dollars and tracked private investments of more than \$27 billion towards AFVentures SBIR/STTR portfolio companies (Air Force, 2022). They also stood up a Capital Initiatives shop to leverage private capital and market insights as capability (Air Force, 2024). Space Force has signed Cooperative Research and Development Agreements with some VC firms to improve ties between government and startups (Erwin, 2021). The DoD has also formed the Office of Strategic Capital (OSC) and requested \$144 million in the FY25 President's Budget to support loan guarantees and grants (Erwin, 2024). Some politicians worry about the deeper connections between government and private investors but they miss the bigger point that it is not about the danger of private money flowing into defense, but rather how to maximize those funds to solve the military's intractable challenges (Lipton, 2023).



Ultimately, founders bear the responsibility if their company is a success, and VCs are responsible to their investors to deliver returns, so it is not realistic to expect every VC with a defense-oriented company in its portfolio to offer every service listed in Figure 8. Different VCs and startups have exit strategies that may not be dependent on winning large defense contracts—i.e., their dual-use focus has a “commercial-first” bent and if they see success there, defense contracts may never be pursued. However, the reason the DoD should care about what VCs are most effective in helping startups transition technology into military solutions is that in the growing panoply of VCs, there may be increasing chances to direct funds, loan guarantees, and collaboration opportunities to different VC entities. While VCs contribution to the national economy and commercialization of new technologies is critically important, Congress and the DoD should find ways to prioritize those firms that can help startups rapidly move an abstract technology into a military solution and create a defense market for new capabilities. AFWERX already includes a different ratio of required private investment to government investment depending on if the technology is dual use or defense focused (Figure 9; Air Force, 2024) This type of model may deserve emulation in different areas across the DoD.

|         | Defense-Only                 | Dual-Use                                |
|---------|------------------------------|---|
| TACFI   | <b>1:1</b><br>SBIR/STTR: Gov | <b>1:1</b><br>SBIR/STTR: Private        |
| STRATFI | <b>1:2</b><br>SBIR/STTR: Gov | <b>1:1:2</b><br>SBIR/STTR: Gov: Private |

Figure 9. AFWERX TACFI/STRATFI Matching Ratios

The DoD should also care where defense-oriented VCs are investing their funds. As Jake Chapman, partner at Marque Ventures, has noted, “We don’t really need any more small unmanned aerial systems (sUAS), but there are plenty of interesting areas, including contested communications, positioning, navigation and timing technologies in GPS denied environments, advanced manufacturing techniques suited to edge manufacturing or to dramatically ramp up domestic production; directed energy technologies, and contested logistics” (Alamalhodaie, 2023). OSC has issued its first investment strategy that clearly outlines a role to focus on “component-level technologies with broad commercial application that are also relevant to the national security of the United States and its allies and partners” (Figure 10; DoD, 2024).

**Initial Priority Areas for the First OSC Program Activity: SBIC Critical Technologies Initiative**

Priority areas (and their related *Critical Technology Areas*) for the first OSC program activity: the Small Business Investment Company Critical Technologies Initiative. These priority areas are intended to be broad enough for investors to take a portfolio approach but narrow enough to increase investment in key industries. OSC will announce priority areas for additional program activities as they become available.

- Nanomaterials and Metamaterials (*Advanced Materials*)
- Bioenergetics (*Biotechnology*)
- Synthetic biology (*Biotechnology*)
- Open RAN (*FutureG and 5G*)
- Sensor hardware (*Integrated Sensing and Cyber*)
- Assembly, Testing, and Packaging (*Microelectronics*)
- Materials (*Microelectronics*)
- Quantum computing (*Quantum Science*)
- Quantum security (*Quantum Science*)
- Quantum sensing (*Quantum Science*)
- Battery storage (*Renewable Energy Generation and Storage*)
- Space-enabled services and equipment (*Space Technology*)

Figure 10. Initial OSC Priority Areas





If the DoD can maintain awareness, likely through the OSC office, on the technology areas that defense-involved VCs are gravitating to, they can potentially send a clearer demand signal if major capability areas are being underrepresented. Quantum tech, for instance, may be more unrepresented than desired given the potential defense applications (see Figure 11 Bradbury, 2023). This is likely why OSC has prioritized quantum in their investment areas and why there may be other opportunities to subtly influence more private investment that has an interest in tapping into the defense space. Jackson Moses, founder and managing partner of Silent Ventures noted that there are also “unsexy areas of manufacturing, supply chain and logistics [that] offer a great opportunity for disruption and new companies and new approaches to be developed—[and are] very large markets that have not benefited from full modernization and will be vital for true national security” (Alamalhodaie, 2023). Tools could include advanced market commitments (AMCs) that can “guarantee a viable initial market for a product once it is successfully developed” (Ho & Taylor, 2021). VCs could establish industry forums for defense-centric areas for collaborative discussions with the DoD on future strategic efforts. There is a lot more creativity that can be applied to creating subtle channels of communication to help ensure that private capital with defense market goals generate the highest impact and improve a VC/startup’s chance of success.

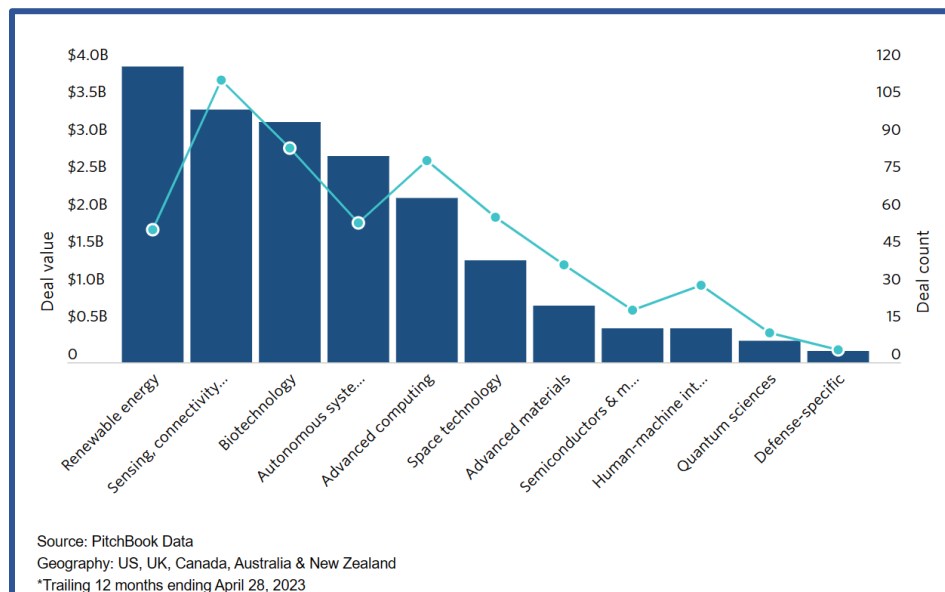


Figure 11. VC Technology Investment Areas

## Going Forward

The focus on how VCs with an interest in the defense space can support transition of innovative technology is not intended to be a substitute for the DoD’s responsibility in this area. The DoD needs to continue making progress on developing streamlined transition pathways for young, innovative companies and setting clear demand signals for industry to understand their greatest needs. There needs to be greater emphasis on moving more awards to non-traditional companies beyond the paltry amounts noted in this paper.

However, the DoD also needs to be proactive in using all of the resources at its disposal to make progress against the numerous capability gaps that still exist in the U.S. and allied military forces. There is an incredible amount of progress already happening in the commercial sector that the DoD needs to integrate and field. But given the size of the defense budget and the hopefully increasing amount of funding moving to new or emerging players in the space, the



DoD also has the opportunity to influence how private investment is leveraged to address current needs and ensure continued focus as threats change over time. This influence can likely be achieved in multiple ways, beyond the good work of AFWERX and OSC.

It could include greater collaboration with organizations like R&E, AFWERX, SOFWERX, and Space Force Front Door that are working to connect startups with program offices and potentially support the co-development of transition strategies with open feedback loops from users. It could include the use of AMCs in certain tech areas to draw more funding. It could include tracking metrics on the most defense friendly VC firms (those actively engaged in transition success) to continue to incentivize those behaviors and encourage others. It could consist of other incentives that give preference to VC firms who are willing to invest in the unsexy but important areas and also in areas where more patient capital is needed. It certainly includes the award of more contracts to startups where VCs are already taking risks so that the desire to remain in the defense space continues to be attractive.

With all these things considered, VCs can serve as transition partners with their founders, the DoD, industry, and Congress.

VCs as Transition Partners with Founders: Defense-involved VCs can act as transition partners with their founders by focusing on long term return on investments and providing a variety of services to include strategic relationships, client introductions, branding, and DoD sector expertise. VCs can also help the startup focus on strategies for user engagement and compliance with cyber and security requirements. This includes creating realistic pathways for sales and marketing as well as integration of the product into weapon systems.

VCs as Transition Partners with the DoD: VCs can act as transition partners with the DoD by engaging in proactive, collaborative discussions to change the policies, incentives, and culture of the DoD. This includes highlighting the value proposition VCs brings to the DoD, identifying challenges, and proposing realistic solutions. Many VCs rely on the DIU to act as interpreter for the DoD. While the DIU will be long remembered as establishing the first DoD beachhead in Silicon Valley, there is no reason why VCs can't engage with the larger DoD directly. But to do so, VCs need a clear understanding of the RIFT (requirements, funding, and transition) processes and barriers.

VCs as Transition Partners with Industry: Defense-involved VCs can act as transition partners for industry by offering market research and introductions to startups with products ripe for integration in larger weapon systems. VCs can also support industry sectors with a pipeline of people, ideas, and products to continue to help established industry push existing technology limits .

VCs as Transition Partners with Congress: The laws enacted at the federal and state level are only as good as the feedback from the constituents the laws affect. VCs can act as transition partners with Congress by joining the public policy conversation and engaging on specific actionable solutions. Advocating for targeted appropriations should be balanced with engaging on policy solutions like embracing industry standards for open systems designs, defining requirements as capabilities instead of platforms, and organizing funding in portfolios.

In addition to offering ways VCs can serve as transition partners, this paper also provides a framework to build upon and to help both VCs and the DoD be more strategic as they garner more private investment and strive to be better partners for the advancement of national security.

As Steve Escavara and Adam Hammer, both private investors, have noted,



Lacking a coherent strategy, the United States is leaving billions in private and public dollars on the table that could help shore up the nation's defense capabilities. The United States is ceding ground to China, which threatens the international order. The Pentagon must use its resources to leverage U.S. capital markets—one of our enduring advantages in strategic competition—and help promising dual-use tech companies scale, innovate, and deliver for the benefit of global democracy. (Escavara & Hammer, 2023)

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