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2021-2022

Innovation in the US Department of Defense

Reforms, Priorities, and Implications for Canada



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Agenda

1 **Executive Summary**

2 **US DoD Innovation Ecosystem**

3 **Canadian Implications**

4 **Appendix**

This report was developed under a Targeted Engagement Grant from the Government of Canada's Mobilizing Insights in Defence and Security Program

About MINDS

- Department of National Defence Mobilizing Insights in Defence and Security (MINDS) program was created to invest and expand defence engagement, providing collaboration between Defence and the defence and security expert community
- Targeted Engagement Grant program aims to drive innovation in defence policy thinking and foster the next generation of defence and security experts

Avascent's Grant

- Avascent was awarded a Targeted Engagement Grant in 2021-2022
- Funding was provided to survey the efforts of the US Department of Defence to promote innovation in technology development and adoption, in an effort to draw on new commercial technologies with military application

For the MINDS Research Grant, Avascent's task was three-fold

Describe the DoD Innovation Ecosystem

- What goals drive the innovation ecosystem?
- Who are the stakeholders and what are their roles in driving innovation?

Identify Challenges and Lessons Learned

- What successes does the ecosystem provide to the DoD?
- What challenges continue to exist or are exacerbated by the DoD's approach to innovation?

Explore Implications for Canada

- Where do DND and DoD have overlapping innovation priorities?
- What opportunities are there for Canada to engage with the DoD?

Shaped by shifting strategic and institutional conditions, the US Department of Defense has been pursuing acquisition reform for decades

Jointness	*Cost Reduction*	*Faster Cycle Time*	*Flexibility*	*Innovation*
1980s	**1990s**	**2000s**	**2010s**	**2020s**
Achieving 'Jointness' in acquisition to gain interoperability and cost efficiencies	***Cost reduction focus from rising per-unit costs*** ***Better management of IT resources and use of commercial practices***	***Faster cycle times, particularly for urgent requirements***	***Greater flexibility in acquisition process to gain cost, schedule, and other efficiencies***	***Reforms to open DoD innovation in comm'l tech and new operating concepts***
▪ **Goldwater-Nichols Act 1986:** Set the organization of DoD and established Office of Secretary of Defense ▪ Reforms arose from lack of coordination shown in US invasion of Grenada	▪ **Federal Acquisition Streamlining Act 1994:** Lower procurement barriers and improve small business access to gov't; increased simple acquisition threshold to $250K ▪ **Clinger-Cohen Act 1996:** Allowed individual federal agencies to acquire technologies	▪ **Weapon System Acquisition Reform Act 2009:** Improve early-stage weapons development with commanders influencing req'ts process and appointment of several new directors ▪ Joint Urgent Requirements ▪ Rapid Acquisition Cells	▪ **Better Buying Power 2010:** Targeted five areas including target affordability, incentivize innovation, promote real competition, improve tradecraft in services acquisition, and reduce non-productive processes and bureaucracy	▪ Acquisition policies focused on six pathways to improve flexibility and delivery: urgent capability acquisition, middle tier acquisition, major capability, software acquisition, defense business systems, and acquisition of services

There are many points of friction affecting DoD's acquisition process that can hinder innovation

Friction in the DoD Acquisition Process by Lifecycle Phase



- Slow, hierarchical validation process
- Tendency to see requirements as a reflection of existing systems, just better
- Entrenched groups may not welcome disruptive concepts
- DoD program/ budget process slows down the formation of new initiatives

- DoD and its suppliers are not well connected outside the traditional defense technology ecosystem
- Limited commercial return on defense may make it hard for some startups to gain financing

- Government contracting processes are slow and can deter newcomers
- 'Valley-of-death' is common, where promising technologies fail to find their way into key designs or supply chains for larger systems

- Culture can at times lead to 'best known' solution from traditional contractors ready to produce and field who understand the system instead of best commercial solution

- Software sustainment processes stuck in the pre-digital era
- Widespread presence of closed systems, with limited options for competition and upgrade

To tackle these issues, DoD has instituted a mix of process reforms and empowered new organizations

In order to attain the goal of Innovation, DoD is drawing on several means

Processes

Institute new processes that either reform or get around the traditional Federal acquisition process

Examples: Contracts, Source Selection, Requirements Definition, Budgeting

Organizations

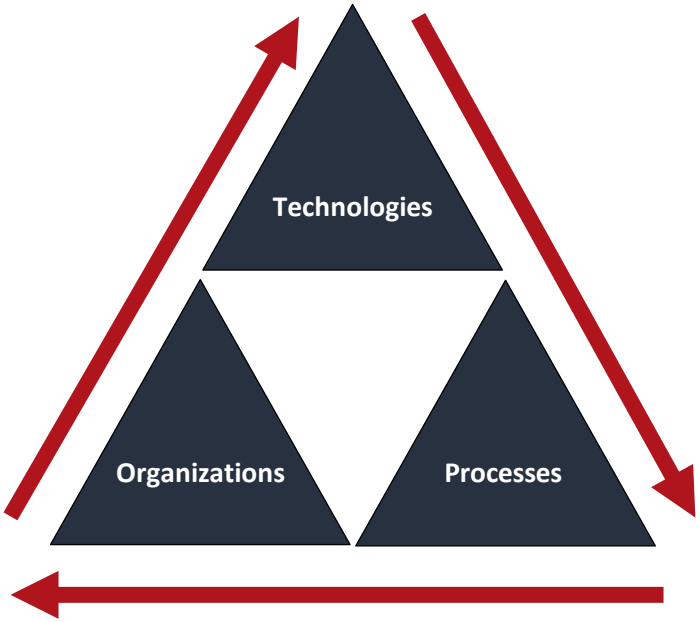
New groups set up to focus on specific technology goals or use non-traditional methods to achieve innovative outcomes

Examples: Strategic Capabilities Office, Rapid Capabilities Office, Joint Artificial Intelligence Center, Defense Innovation Unit, etc.

Technologies

Specific technology priorities pursued using a mix of newly formed organizations, funding pools, or non-traditional processes

Examples: Artificial Intelligence, Hypersonics, Space Technologies



DoD's innovation efforts show close relationships among reforms to processes and organizations, and the targeting of high-priority technologies

DoD has instituted changes in acquisition process that aim to streamline the execution of key activities and to ease the way for new solution providers

Sample Process Reforms*		Innovation Objectives: Faster Cycle Time	Newer Solution Providers	More Effective Solutions
Adaptive Acquisition Framework	Development of acquisition pathways approach inclusive of urgent capability acquisition, middle tier acquisitions, major capabilities, software, defense business systems, and acquisition of services with the objective to deliver better solutions faster	✓		✓
Middle Tier Acquisitions	MTAs provide a pathway to rapidly develop and deploy fieldable prototypes within a shorter time-frame (2-5 years) than traditional FAR contracting typically allows	✓		
SBIR Contracts	SBIR and STTR awards are used to facilitate R&D activity, particularly among small businesses and academia on a wide range of technical topics. These contracts are not new, but DoD is making wider use of them to reach commercial firms and test new ideas		✓	
Other Transaction Agreements	OTAs provide a much faster means for agencies to contract for prototypes and innovative R&D than traditional FAR-based contracts allow. The Services are using OTAs to experiment with a wider array of designs and providers	✓	✓	✓
DevSecOps	Adoption of commercial best practices for agile software development and sustainment. Using cross functional teams for development (dev), cybersecurity (sec), and operations (ops) for resilient software solutions	✓		✓
Simulated Challenges	DoD Organizations and DoD end users identify key challenges and invite defense & civilian community to identify conceptual technologies for solutions (e.g., NSIN and AFRL set AI for Command challenge for new AI planning capabilities)			

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* This is not an exhaustive list

Since 2010, DoD has created a series of new organizations that are charged with enabling greater innovation across a given technical area

	Accelerator/Incubator	Connector
	Providing resources and programming to scale and develop solutions, technologies, and startups	*Building networks across government, industry, and academia to expand ecosystem of solution providers*
Defense Agencies	JAIC, dreamport, SDA, iqt, Defense Innovation Unit	SOFWERX, NSIN
Army	Army Venture Capital Initiative	Army Applications Laboratory, ERDCWERX
Navy	NAVALX	
Air Force/ Space Force	CYBERWORX, HYPERSPACE CHALLENGE, KESSELRUN	AFWERX, BESPIN, STRIKEWERX

Beyond new organizations, pre-existing DoD acquisition and research organizations are increasingly encouraged to use reforms to drive innovation

DoD has prioritized investment and reform in a handful of technology areas that are key to its defense strategy

Key Technologies*	New Organizations Created	Reforms Implemented
 **AI & Machine Learning**	Joint Artificial Intelligence Center drives AI implementation across services	Leveraging OTAs via Tradewinds project to acquire AI quickly, simulated challenges also common for early R&D
 **Autonomy**	None created with services leveraging various accelerators and connectors to bring in technology	Wide range of traditional and OTAs used based on maturity, more niche emerging technologies displayed via showcases or SBIR awards
 **Cyber**	Responsibility lies mainly with existing Joint and Service entities	Heavy use of OTAs for prototypes and R&D; DevSecOps of growing importance with DOD wide strategy launched May 19,2021
 **Hypersonics**	None created with the Services and MDA have relied on existing R&D centers	Volume of OTAs are leveraged across various services for R&D
 **National Security Space**	Space Development Agency formed to quickly deliver space-based capabilities and disrupt space acquisition processes	Heavy use of OTAs for prototypes and R&D; SDA leveraging SBIRS to 'seed the ecosystem'
 **Networked C4**	None explicitly created, with services leveraging various organizations (e.g. Army Futures Command)	Army commonly leverages OTAs and MTAs, with SBIRS often used for early stage R&D partnerships
 **Quantum Technology**	None created, leveraging existing organizations for pilot research programs	Limited use of reforms, with traditional R&D contracts with defence primes and research centers

While DoD has made policy changes to advance these priorities, it has also made targeted increases in R&D funding

**Source: USDR&E modernization priorities; other priorities not listed include directed energy, biotechnology, microelectronics and 5G*

While DoD has had some success from its innovation push, the Department has not set out clear metrics by which to judge its progress

More "inputs" are flowing to sponsor non-traditional practices and providers…

- Increase in OTA contracts for **prototyping**, particularly for Space and C4ISR
- Greater share of DoD contracts flowing to **firms outside of traditional defense prime contractors** (e.g., DIU awarded 208 contracts to commercial firms between 2016 and 2020*)*
- Increase in **warfighting experiments** across branches held to evaluate technologies and operational concepts (Sofwerx has hosted 220+ events showcasing technologies)
- Injection of **design thinking** and **agile** concepts into procurement teams

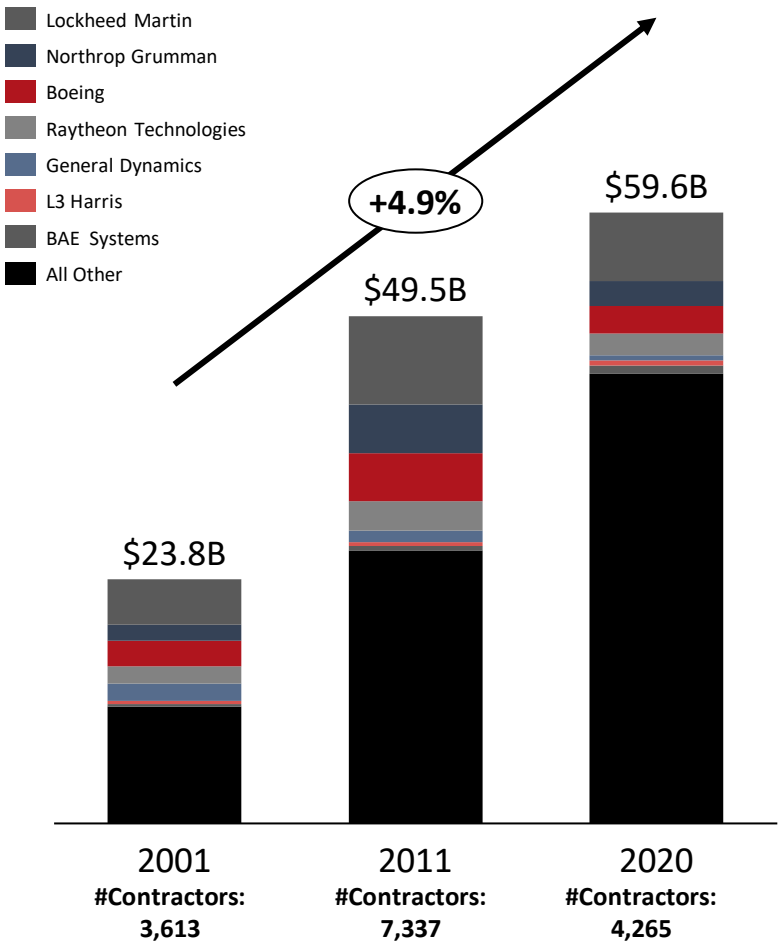
… Driving some signs of success

- Greater competition achieved for space launch drawing on commercial providers as well as traditional space primes
- Adoption of commercially developed defense systems, like the $480M contract for Integrated Visual Augmentation System (IVAS) "Hololens" with Microsoft
- DoD DevSecOps Enterprise Strategy guide developed in 2021 to integrate practices across the department
- Air Force ABMS has demonstrated advances in cross-platform networking and automation (e.g., F-35 to F-22 links, U-2 sensor automation, etc.)

However, it is unclear whether innovation 'inputs' are achieving goals at scale and yielding the kinds of operational results that DoD wants

One way of evaluating whether DoD is making progress is to consider whether the Department is attracting a wider array of technology suppliers

Evolving DoD R&D Supply Chain



Areas of Success

- Total contractors participating in R&D varied over last two decades, but traditional defence prime contractor share has decreased
- New entrants over last two decades, particularly in C4I and Space are increasing share
  - Newer C4ISR players like Palantir now in Top 50
  - SpaceX is now in Top 60 contractors for R&D
  - Small business York Space Systems in Top 300

More Progress Needed

- Spending is still highly consolidated, with Top 100 contractors holding ~85% of R&D spending
- Despite progress in expanding supplier base, competing overarching policies are creating more barriers to entry for new players (e.g., Buy America policy, Cybersecurity Maturity Model Certification creating more roadblocks)

AVASCENT Source: FPDS data

There are implications from DoD's efforts for both Canadian Government and Industry

Implications for Canadian Government

- **Define and implement metrics for innovation outcomes**
    - These can include cycle time, delivery of new capabilities to end users, providing a proof of concept for firms looking to export, or others
    - Programs like IDEaS already looks to connect new solutions directly with customer groups
- Other governments **continue to wrestle the 'Valley of Death' with no silver bullet solution**
    - Once designs and supply chains are formed to support major programs, creating space for new technologies and providers remains challenging
- Canada's ITB/VP and KICs policies provide ways to direct investment into innovative areas
- Common areas of technical priority between DND and DoD create opportunities for collaboration

Implications for Canadian Industry

- Canadian of firms can access the DoD Innovation ecosystem, but there are barriers to entry
    - **There are few structural barriers within the DoD ecosystem to limit Canadian firms from engaging** (e.g., cannot access SBIR programs, may need in-country office to meet some req'ts)
    - **Firms may also want to seek out partners and/or consortia with similar objectives** to benefit from cross-border collaboration
    - However, **larger firms may have an advantage in navigating the vast DoD landscape** and positioning for opportunities compared to limited resources of SMEs
- Beyond the ecosystem, growing Buy America pressures may be an emerging point of resistance with communities

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4 Appendix

There are several internal and external drivers that impact DOD's priorities and influence the innovation ecosystem

Internal

Budget Tightening

Slowing defence budget growth has forced decision-makers to implement more efficient processes and acquire commercial technology that promises more bang-for-their-buck

Aging Workforce

Challenges in training a rapidly aging DoD workforce on increasingly sophisticated military hardware and software has forced departments to adopt digital tools to help streamline activities

Legacy Platform Utilization

Ballooning costs of developing new platforms has pushed leadership to explore methods of extending service life of legacy systems through technologies such as AI, autonomy, and data fusion

External



Evolving Threats

Growing threat of near-peer adversaries narrowing gap or evening leapfrogging US military advantage through large investments in areas like hypersonics (Starry Sky-2) and UAVs (Wing Loong II) has caused consternation in DoD

Commercial Technology

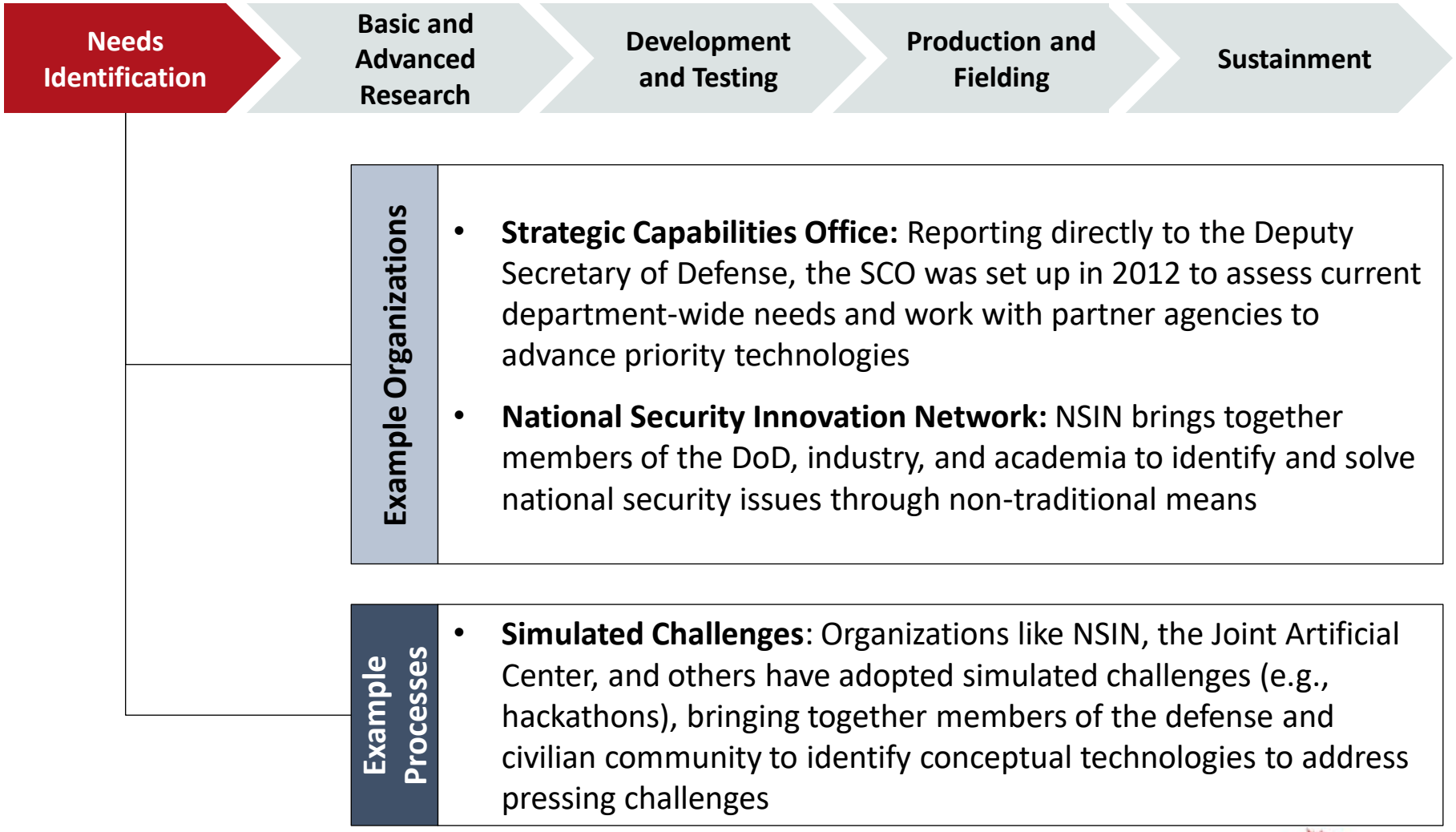
Shift of cutting-edge products and research from government to commercial world has pushed DoD to create avenues to access innovative commercial technology

DoD's acquisition pipeline has traditionally been slow, with cumbersome processes inhibiting acquisition of innovative capabilities in timely fashion



	Needs Identification	Basic and Advanced Research	Development and Testing	Production and Fielding	Sustainment
Description	*Identifying requirements in both operational and technical terms to meet strategic goals*	*Performing research to prove concept feasibility and advance enabling technology*	*Testing and demonstrating under controlled conditions to prove soundness of a given technology*	*Producing service-ready solutions for fielding, typically with assistance from contractors and under DoD supervision*	*Maintaining and upgrading fielded capabilities to maintain effectiveness*
Potential Challenges	• Conceptualizing future technology trends and threat environments • Slow, rigid, hierarchical approval processes • Emphasis on how existing methods could have marginally better performance, not disruption	• Exploring the most relevant technologies and enablers • Encouraging contractors to invest internal R&D funds	• Avoiding the 'valley-of-death' where solutions die before maturing • Failure to embrace promising technologies that may not be incorporated into the design or supply chain or a larger system	• Gaining sufficient funding and acquisition authority for procurement • Overcoming cost and schedule overruns • Fielding technology in a timely manner	• Developing and fielding updates rapidly • Exploring new use cases for already-fielded technologies • Minimizing operating and sustainment costs

DoD has created collaborative organizations and venues to help conceptualize current and future needs



Although the means of conducting research remains similar, both new and old organizations have adapted to meet new requirements for advanced tech



Example Organizations

- **DARPA:** A keystone of the defense innovation ecosystem for decades, DARPA oversees research into key technology areas, ranging from directed energy and AI to smallsats and quantum computing
- **Army Research Lab:** ARL conducts foundational S&T research with gov't, academic, and industry partners to advance critical technology areas for the Army

Example Processes

- **SBIR/STTR:** SBIR and STTR awards are long-standing vehicles, sponsored by services and agencies, to facilitate input and R&D activity from industry and academia on a wide range of technical topics
- **Cooperative R&D Agreements:** In effect since the 1980s, CRADA has provided a streamlined pathway for encouraging cooperative R&D between industry, academia, and the government

The shortfalls of traditional acquisition authorities have pushed DoD to partner implement faster processes and partner more with agile commercial firms



Example Organizations

- **Defense Innovation Unit:** Established in 2016, the DIU works with non-traditional suppliers to rapidly prototype comm'l solutions for DoD use
- **AFWERX:** Most prominent of the 'WERX' family of organizations, AFWERX accelerates development and adoption of commercial technology
- **Cyber Fusion Innovation Center:** Founded in 2020, the CFIC helps develop and deliver cyberspace effects and capabilities to Army Cyber Command

Example Processes

- **Other Transaction Authorities:** OTAs provide agencies with a flexible tool to research and prototype innovative technology—frequently from non-traditional suppliers—at a faster pace than traditional FAR-based contracts allow
- **Competitions:** Organizations like AFWERX have run challenges to identify and develop solutions to critical DoD issues, often with the promise of monetary or contract award

DoD has empowered new organizations and acquisition authorities to help transition critical capabilities from development to production-stage



Example Organizations

- **Space Development Agency:** Formed in 2019, the SDA has become the marquee space acquisition organization, tasked with harnessing the best of commercial and defense space innovation to procure ground and space assets rapidly and at a lower cost than traditional agencies

Example Processes

- **Urgent Operational Needs:** Utilized extensively in Afghanistan and Iraq, UONs provide a mechanism to rapidly develop, test, produce, and field capabilities that are deemed urgent for current or expected operations
- **Middle Tier Acquisition:** MTAs provide a pathway to rapidly develop and deploy fieldable prototypes within a shorter time-frame than traditional FAR contracting typically allows

A focus on iterative upgrades has helped alleviate the high-cost and long lead-times typically associated with sustainment



Example Organizations

- **Kessel Run:** With operations at Hanscom AFB, Langley, and Boston, Kessel Run builds, delivers, sustains, and iterates software applications to meet the urgent needs of warfighters

Example Processes

- **DevSecOps:** Whether through internal developers (e.g., Kessel Run, Bespin) or contractors (e.g., Red Hat), DoD is increasingly embedding DevSecOps personnel within operational units to not only develop, but also continually iterate and sustain software solutions to maintain the most up-to-date capabilities at a fraction of the cost of traditional sustainment contracts

To regain its overmatch capability against adversaries, DoD has prioritized a handful of key technologies

Select Technology Areas*	Discussion
Artificial Intelligence & Machine Learning	*Artificial intelligence and machine learning can substantially increase efficiency and speed of warfighters' tasks and decision-making*
Autonomy	*Autonomous, semi-autonomous, and manned-unmanned teaming drives efficiencies in manpower and responses times, while enabling new doctrines (e.g., swarming UAS)*
Cyber	*Growing competition in cyberspace among state and non-state actors has prompted significant investment in offensive and defensive cyber capabilties*
Directed Energy	*Directed Energy weapons offer advantages in range, cost, and scalability over traditional kinetic weapons*
Hypersonics	*Hypersonic missiles hold the potential for revolutionary offensive and defensive strike capabilities, able to out-run defenses and intercept traditional missiles with ease*
National Security Space	*Proliferation of low-cost satellites provides substantial opportunity a leap forward in military communications, ISR, PNT, electronic warfare, and potentially offensive strike*
Networked C4	*Drive towards Joint All-Domain Command and Control (JADC2) architecture requires ability to create data commonality between sensors, C2, communications, and effectors*
Quantum Technology	*Advances in quantum technology promise to unlock nearly foolproof data security for computing, communications, and GPS/PNT*

*Source: USDR&E modernization priorities; other priorities not listed include biotechnology, microelectronics, and 5G.

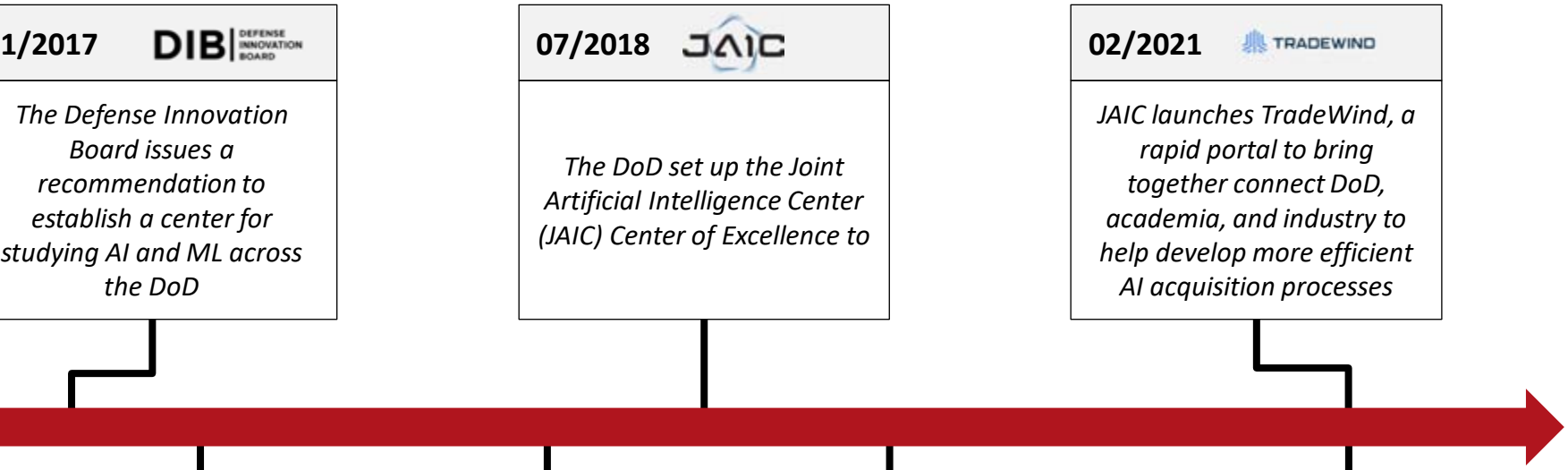
While DoD has sought innovative processes to gain priority technologies at speed, it still must frequently rely on traditional acquisition methods

Select Technology Areas*	Acquisition Strategy Examples
Artificial Intelligence & Machine Learning	
Autonomy	
Cyber	**Non-Traditional** • Newly-created organizations like the Cyber Fusion Innovation Center, AF Cyberwerx, and Kessel Run have prioritized ecosystem development to non-traditional suppliers and utilizing DevSecOps approach to rapidly test and field cyber capabilities **Traditional** • Significant cyber software tools development continues to be developed by traditional primes, federal services, and SETA contractors with long-standing histories with the defense customer community
Directed Energy	
Hypersonics	
National Security Space	**Non-Traditional** • Newly-created agencies like Space Force and the Space Development Agency have extensively used non-traditional providers for both satellite manufacturing (e.g., York Space) and launch (e.g., SpaceX) **Traditional** • Programs such as BLACKJACK and the Transport and Tracking Layers demonstrate an ability to rapidly develop and launch satellite constellations at a fraction of the cost of past platforms
Networked C4	**Non-Traditional** • The ABMS program, a cornerstone of the emerging All-Domain C2 architecture, has used IDIQ on-ramps to bring on new suppliers, providing the Air Force flexibility to shrink or grow contract scope to meet the requirements of each task order **Traditional** • Much of the early-stage R&D work underpinning new developments in data fusion were spearheaded by DARPA, utilizing traditional SBIR S&T contracts
Quantum Technology	

*Source: USDR&E modernization priorities; other priorities not listed include biotechnology, microelectronics, and 5G.

The case of AI/ML demonstrates the key interplay between innovative organizations and processes to acquire priority technologies

Artificial Intelligence & Machine Learning



01/2017 DIB Defense Innovation Board

The Defense Innovation Board issues a recommendation to establish a center for studying AI and ML across the DoD

07/2018 JAIC

The DoD set up the Joint Artificial Intelligence Center (JAIC) Center of Excellence to

02/2021 TRADEWIND

JAIC launches TradeWind, a rapid portal to bring together connect DoD, academia, and industry to help develop more efficient AI acquisition processes

01/2018

Secretary of Defense Mattis releases DoD's 2018 National Defense Strategy, which identifies AI and ML as a priority technologies

2018 DARPA

Following DoDs' lead, agencies set up new initiatives to lead AI/ML dev efforts, including the USAF AI CFT, Army AI Integration Center, and DARPA's $2B AI Next campaign

02/2019

The DoD releases its AI Strategy, which calls for rapid scaling and fielding of AI/ML capabilities and greater engagement with leading comm'l AI providers

02/2021 JAIC

JAIC released a RFP for a multi-award blank purchase agreement worth up to $249M to acquire AI testing and evaluation capabilities

To tap into the latest and greatest commercial technology, DoD has sought to develop avenues for reaching non-traditional suppliers

	Commercial Firms	IT Solutions Providers	Defense Startups	Commercial Startups
Description	Large commercial firms with growing DoD presence competing directly with traditional defense primes	While traditionally focused on providing computing hardware, IT solutions providers also lead innovative tech (e.g., cloud, AR/VR)	Startup firms which have grown largely off defense and intelligence contracts	Commercially-oriented startups with growing, but still limited exposure to the DoD
Engagement Strategy	DoD engages through large PoRS, looking for faster, cheaper, solutions (e.g., SpaceX NASAspace launch, GM Defense ISV award)	Engagement primarily through large IT IDIQs and PoRs (e.g., JEDI), as well as experimental OTAs (IVAS)	Engagement largely through SBIR or OTAs before transitioning into larger PoRs (e.g., Andruil DIU C-UAS award)	DoD attracts comm'l startups through pitch competitions, challenges, and accelerator programs (e.g., AAL partnering with krtkl on RCV)

Although the number of accelerators and connectors is increasing, there is still a dominance of contracting authorities and research partners

ORGANIZATION TYPE	Accelerator and Incubator	Connector	Traditional Contracting Authority	Research Partner
DESCRIPTION	*Providing resources to scale and develop startups*	*Building networks across government, industry, and academia*	*Executing awards for contracts and agreements*	*Universities or corporate research centers partnered with DoD*
REPRESENTATIVE ORGANIZATIONS	20 Organizations	25 Organizations	44 Organizations	30 Organizations



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Most organizations help identify needs, conduct basic and advanced research, and aid with development and testing

ACQUISITION PIPELINE

Needs Identification	Basic and Advanced Research	Development and Testing	Production and Fielding	Sustainment
DESCRIPTION: *Identifying requirements in both operational and technical terms to meet strategic goals*	*Performing research to prove concept feasibility and advance enabling technology*	*Testing and demonstrating under controlled conditions to prove soundness of a given technology*	*Producing service-ready solutions for fielding, typically with assistance from contractors and under DoD supervision*	*Maintaining and upgrading fielded capabilities to maintain effectiveness*
30 Organizations	70 Organizations	65 Organizations	15 Organizations	3 Organizations

REPRESENTATIVE ORGANIZATIONS

AFRL

ARMY APPLICATIONS LABORATORY

JAIC

DOOLITTLEINSTITUTE

Army Venture Capital Initiative

Georgia Tech Research Institute

MITRE | AiDA acquisition in the digital age

CNA

DEVCOM CHEMICAL BIOLOGICAL CENTER

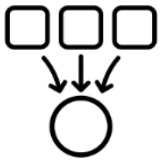
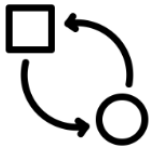
Naval Information Warfare Center

RCCTO

SDA

Most organizations focus on priority technology acquisition and commercial sourcing

INNOVATION PROCESSES

Priority Technology Acquisition	Acquisition Process Innovation	Commercial Sourcing	Policy Advisory	Organizational Transformation
				
DESCRIPTION				
Pursuing development of priority technologies (e.g., hypersonics, AI, directed energy, etc.)	*Utilizing innovative acquisition methods to buy faster, cheaper, and better solutions*	*Putting in place avenues to work with non-traditional firms to access commercial capabilities*	*Developing frameworks and processes to oversee and encourage innovation throughout DoD*	*Encouraging an internal culture of innovation among DoD's workforce and in its processes*
REPRESENTATIVE ORGANIZATIONS				
52 Organizations	9 Organizations	19 Organizations	5 Organizations	5 Organizations

iqt

IDA

DARPA

ONR

CATALYST ACCELERATOR

NSIC

DEVCOM DATA & ANALYSIS CENTER

DEFENSE INNOVATION UNIT

Defense Innovation Marketplace

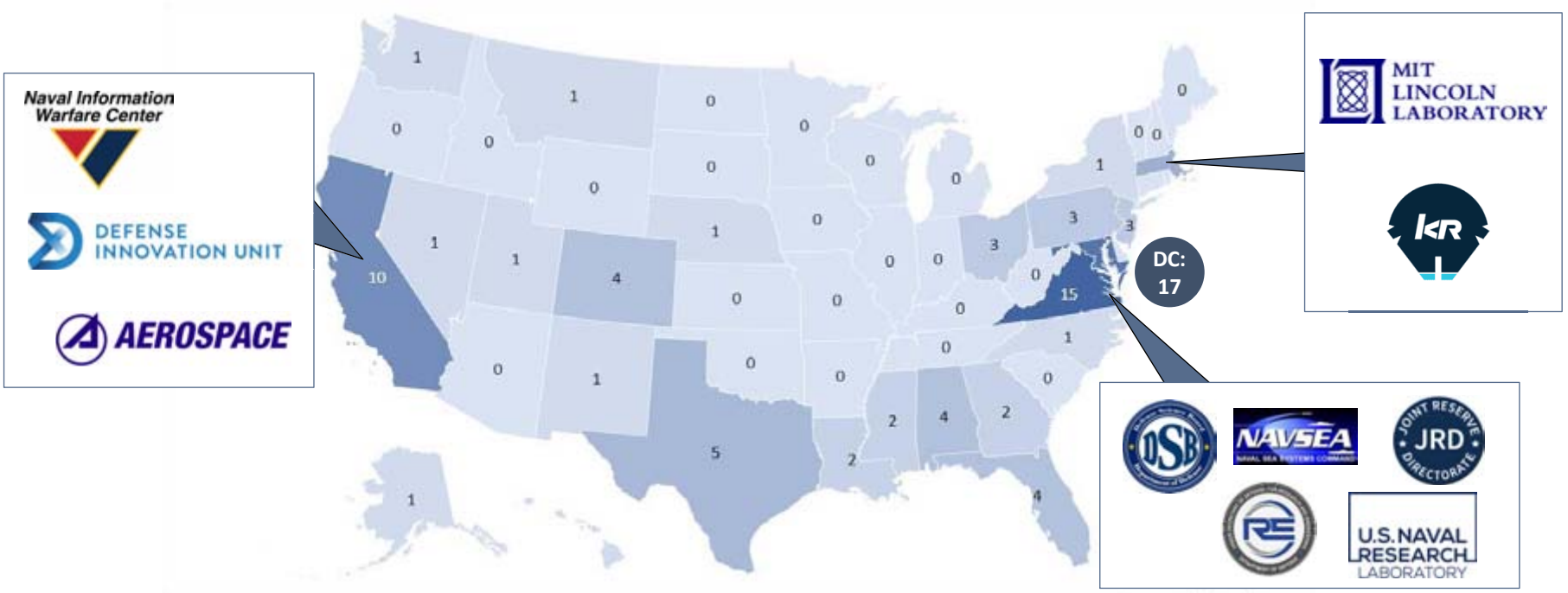
NSTXL

RAND

MGMWERX

NAVALX

Clusters of DoD innovation are concentrated around Washington DC and California, with smaller presence in New England and elsewhere



Capital Region

- Largest number of innovation organizations are **clustered in capital region**, with 17 HQs in DC, 15 in Virginia, and 13 in Maryland
- Mostly **older organizations**, with a focus on **contracting authorities and research partners**

California

- Large cluster of organizations in California, with a mix of **long-standing research partnerships** (e.g., USC) and newer agencies attracted to **comm'l tech hub** (e.g., DIU)
- Proximity to West Coast naval yards creates **Navy customer focus**

New England

- Modest presence in New England, mainly **concentrated in Boston area**
- **Mix of traditional** (e.g., MIT Lincoln Labs) and **new organizations** (e.g., Kessel Run, MIT-USAF AI Accelerator)

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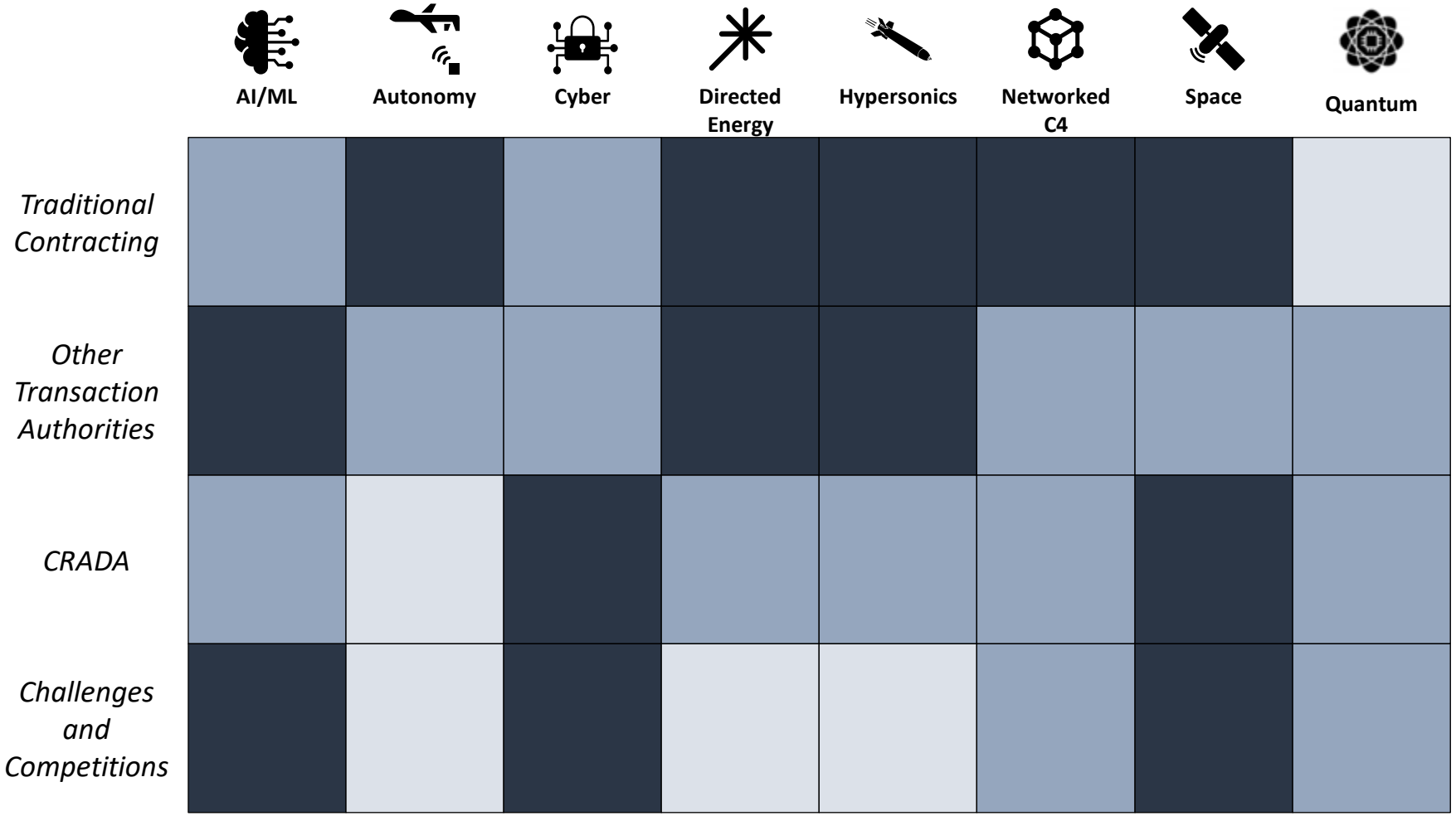
4 Appendix

Except SBIR and STTR funding, there are several eligible pathways for Canadian companies to tap into the DoD innovation ecosystem

Acquisition Avenues	Description	Canadian Eligibility?
Traditional Contracting	• Traditional acquisition method, whereby contracts are bound by FAR/DFAR policies and requirements • While not always true, FAR/DFAR contracts are typically slower and due to more onerous oversight and reporting requirements	YES
Other Transaction Authorities	• OTAs provide a flexible, more agile contracting option for speeding up awards for R&D, prototyping, and commercial technology • OTAs can be awarded directly to suppliers or through consortia	YES
SBIR/STTR	• The SBIR and STTR programs provide funding for small businesses to research critical science and technology areas under sponsorship from government agencies • To be eligible for SBIR/STTR, firms must be majority American-owned	NO
CRADA	• CRADA is a research partnership between federal laboratories and corporations, non-profits, academic institutions, and state and local governments	YES
Challenges and Competitions	• DoD organizations have begun utilizing competitions, challenges, and 'hackathons' to bring together traditional and non-traditional players to rapidly explore innovative solutions to a pressing issue • Frequently involve monetary prizes or promises of a formal contract	YES

NOTE: While Canadian firms are eligible based on acquisition avenue, other conditions (e.g., CMMC, place of performance, Buy America) may limit participation for some opportunities

DoD has leveraged different acquisition avenues when pursuing different priority technologies



Source: USDR&E modernization priorities; other priorities not listed include biotechnology, microelectronics, and 5G.

There are several lessons learned from the DoD Innovation Ecosystem and opportunities for Canada

Implications for Canadian Government

- Canadian innovation programs will want to ensure key metrics of success are focused on capabilities meeting needs and getting into the hands of end users and/or providing a proof of concept for industry looking to export
    - Programs like IDEaS already looks to connect new solutions directly with customer communities
- Other governments continue to wrestle the 'Valley of Death' with no silver bullet solution
- Canada's ITB/VP policy and Key Industrial Capabilities provides differing approach to inject investment into innovative areas in contrast to DoD Approach
- Areas of overlapping government priorities and industrial strength in emerging technologies in Canada (e.g., autonomy, Quantum, AI) could be an opportunity for joint calls to industry or cross-border collaboration

Implications for Canadian Industry

- Canadian of firms can access the DoD Innovation ecosystem with select barriers to entry
    - There are few structural barriers within the DoD ecosystem to limit Canadian firms from engaging (e.g., cannot access SBIR programs, may need in-country office to meet some req'ts)
    - Firms may also want to seek out partners and/or consortia with similar objectives to benefit from cross-border collaboration
    - However, larger firms may have an advantage in navigating the vast DoD landscape and positioning for opportunities compared to limited resources of SMEs
- Beyond the ecosystem, growing Buy America pressures may be an emerging point of resistance with communities

Agenda

1 Executive Summary

2 US DoD Innovation Ecosystem

3 Canadian Implications

4 Appendix

Complementary to this report, Avascent conducted a mapping exercise to identify and catalogue the US DoD innovation ecosystem



- The database catalogues 104 unique organizations identified in this exercise, including information and sourcing on organization type, activities, location, and more
- The database includes a dynamic dashboard for simplified data visualization

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