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CANADIAN  
ARMED FORCES

# Innovation for Defence Excellence and Security

Annual Report 2018-2019

*Engaging Innovators to Make Canada Strong*



## IDEaS IDEeS

**INNOVATION FOR DEFENCE  
EXCELLENCE AND SECURITY**

**INNOVATION POUR LA DÉFENSE,  
L'EXCELLENCE ET LA SÉCURITÉ**



**STRONG  
SECURE  
ENGAGED**

**PROTECTION  
SÉCURITÉ  
ENGAGEMENT**

Canada 

**CAN UNCLASSIFIED**



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Annual Report 2018-2019  
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## MESSAGE FROM THE MINISTER OF NATIONAL DEFENCE

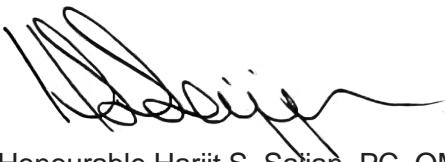
I am pleased to present the first annual report for the Innovation for Defence Excellence and Security (IDEaS) program. IDEaS helps support the needs of the women and men of the Canadian Armed Forces so that they can be prepared, trained, and equipped to defend our country. This report showcases the considerable accomplishments of the program in bringing Canadian innovators on board and details the investments made to date.

The IDEaS program was announced in 2017, with an investment of \$1.6 billion over 20 years, in Strong, Secure, Engaged, Canada's Defence Policy. With this new program, the Government of Canada is reaching beyond traditional defence and security providers to encourage all Canadians to provide the solutions we need for our service members. By casting this broader net, we are aiming to attract novel, impressive solutions that had not previously targeted the realms of defence and security. In addition to expanding the base of Canadian innovators, IDEaS creates economic opportunities for new technology and invests in defence and security capabilities for the long term.

IDEaS helps ensure the Canadian Armed Forces maintains its operational effectiveness and ability to work with key partners and allies. It also enhances Canada's ability to mitigate or eliminate emerging threats, and stay ahead of our adversaries. IDEaS provides transparent and equal funding opportunities to help innovators mature and share their defence and security solutions.

The pages that follow detail how IDEaS works, its support of Canada's innovation community, accomplishments during the past year, and next steps. In future versions of this report, we will keep you up to date on results achieved and bring you stories of the great things Canadian innovators are accomplishing for the women and men of our Canadian Armed Forces. I trust you will find this report helpful and informative.

Yours sincerely,



The Honourable Harjit S. Sajjan, PC, OMM, MSM, CD, MP







**RECRUITING  
INNOVATORS**

**SUPPORTING  
DEVELOPMENT**

**MATURING  
INNOVATIVE  
SOLUTIONS  
TOWARD  
ADOPTION**

# TABLE OF CONTENTS

<b>MESSAGE FROM THE MINISTER OF NATIONAL DEFENCE</b> .....	<b>3</b>
<b>MESSAGE FROM THE ASSISTANT DEPUTY MINISTER (SCIENCE AND TECHNOLOGY)</b> .....	<b>6</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>7</b>
<b>WHY WAS IDEaS CREATED?</b> .....	<b>9</b>
<b>HOW DOES IDEaS WORK?</b> .....	<b>10</b>
<b>WHAT IS IDEaS' PURPOSE?</b> .....	<b>12</b>
<b>WHAT CAN IDEaS ACCOMPLISH?</b> .....	<b>13</b>
<b>WHAT HAS IDEaS DONE SO FAR?</b> .....	<b>14</b>
<b>HOW DOES IDEaS ENGAGE INNOVATORS?</b> .....	<b>17</b>
<b>WHAT HAVE WE LEARNED?</b> .....	<b>18</b>
<b>WHAT ARE IDEaS' FUTURE PLANS?</b> .....	<b>19</b>
<b>HOW CAN YOU CONTACT US?</b> .....	<b>20</b>

## MESSAGE FROM THE ASSISTANT DEPUTY MINISTER (SCIENCE AND TECHNOLOGY)

I am very pleased to issue this inaugural report for the Innovation for Defence Excellence and Security (IDEaS) Program. *Strong, Secure, Engaged*, Canada's defence policy, places an emphasis on the need for continual innovation across all Department of National Defence (DND) and Canadian Armed Forces (CAF) activities; IDEaS is a great tool to achieve this. IDEaS provides the Defence Team with a focused means of accessing innovation and is a direct complement to other longstanding DND research programs.



IDEaS will continue to make new and existing innovators aware of DND and CAF defence and security problems. Extensive consultations will influence and refine those hard problems into challenges which allow innovators to see how their expertise might provide the DND/CAF with cutting-edge solutions. Through IDEaS, DND will provide the necessary funding and guidance to mature those innovative solutions into products, or integrate them into existing S&T programs – which will include extensive collaboration with allied nations. DND/CAF is already benefiting greatly from the extraordinary talent and ingenuity of innovators across Canada.

IDEaS has accomplished a great deal in its first year of operation. It has engaged with academia, industry, for-profit and non-profit sectors, and other levels of government to put many innovative solutions into action. The response to the program has been excellent and its continual refinement will ensure that DND/CAF defence capabilities will remain on the leading edge. I am proud of what has been achieved in this past year across all of the research programs within ADM Science and Technology (S&T) and for the synergy that IDEaS investment has brought to overall S&T and innovation capabilities.

A handwritten signature in black ink, appearing to read 'Isabelle Desmartis', with a long, sweeping flourish extending to the right.

Isabelle Desmartis  
Assistant Deputy Minister (Science & Technology)  
Chief Executive Officer, Defence Research and Development Canada  
Department of National Defence



## EXECUTIVE SUMMARY: MOVING IDEaS FORWARD

It has been a genuine privilege to work with all those individuals who have helped make this first year of IDEaS such a success. To the Canadian innovator community, our DND/CAF stakeholders, our Defence evaluators/integrators and supporters, and our engagement champions: thank you very much for embarking on this journey with us and giving so much of your time, energy, expertise, and valuable feedback.



Eric Fournier, Director General, S&T Strategic Decision Support, Lead for IDEaS (L), Chris Brosinsky, Acting Director - Science & Technology Innovation Strategies ADM(S&T) (R)

This report is being delivered on the one-year anniversary of the launch of IDEaS to highlight the accomplishments of the past year, and present our current and future activities. This first year has been critical to future program success. In the next year, IDEaS will launch its remaining three (of eight) elements to more fully engage the innovators, and increase overall annual investment to a steady level of \$84 million per year.

DND’s investment in IDEaS serves to bolster Defence S&T research programs, and seeks to improve access to and for traditional and non-traditional innovators so they can offer their solutions towards the toughest defence and security challenges. IDEaS will continue to increase the level of awareness about, and influence of the Canadian innovation ecosystem on, defence and security challenges. IDEaS will do this by encouraging innovators to apply their knowledge and expertise to these challenges. The program will also provide innovators with the opportunity to demonstrate how their ideas can enhance defence capabilities.

### Highlights from the first year of activities include:

**Competitive Projects** element: 25 defence and security challenges were issued through two calls for proposals (CFPs).



**More than 750 proposals were received. One hundred and sixty contracts were awarded across a broad spectrum of innovators. Initial investment in potential solutions to improve defence capability totaled more than \$26 million. Each of these initial efforts will be followed closely for potential additional investment or integration into ongoing programs.**

**Innovation Networks** element: Two CFPs were issued to foster research capabilities in two critical areas: Advanced Materials, and Autonomous Systems.



**More than 100 letters of interest, and 43 full proposals, were received. Early collaboration among supporters across 12 micro-networks was initiated. IDEaS will be investing \$18 million during a three-year period in these efforts.**

**Sandboxes** element: Innovators with independently developed prototypes ready for demonstration were asked to respond to five requests for information (RFIs). Submissions led to this year's first Sandbox event:



**A Sandbox will be conducted on the Counter Unmanned Aerial Systems challenge in the fall of 2019 in Suffield, Alberta.**

The 27 challenges - 25 in Competitive Projects and two in Innovation Networks - that have been released cover many critical themes for CAF/DND. These include:

- Operating in Austere Environments,
- Defending Space Missions,
- Building Cyber Capability,
- Accelerating Next-Generation Technologies,
- Enhancing Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR),
- Putting Our People First, and
- Protecting Our Forces.

Planned CFPs across several program elements will introduce challenges covering the themes of:

- Increasing Combat Power,
- Sustaining Operations, and
- Greening Defence.

Outreach and promotion have also comprised a major endeavor in our first year of operations:



**IDEaS has built a network of more than 3,000 stakeholders. More than 170 contracts/contribution agreements have been signed and initiated with Canadian innovators. The program will commit even more resources to these important activities in the upcoming months.**

Thank you for taking part in this journey. IDEaS is truly a dynamic collaboration. The program has achieved many milestones in its first year of operation, and we look forward to many more in the next 19 years.

Eric Fournier  
 Director General, S&T Strategic Decision Support  
 Lead, Innovation for Defence Excellence and Security (IDEaS)

## WHY WAS IDEaS CREATED?

Accessing innovative solutions to augment defence and security capabilities – both immediately and for the future – is critical for Canada and its allies to mitigate new threats, stay ahead of potential adversaries, and meet evolving defence and security needs. The complex and constantly evolving nature of conflict and crises requires that S&T address potential threats and risks such as:

- Space-based capabilities, cybersecurity issues,
- Emerging diseases, pandemics,
- New and unpredictable adversaries,
- Unstable and failing states,
- Terrorism and technology,
- Globalization of S&T and pace of technological developments.

In response to this environment, IDEaS was launched as a DND program committed to augmenting DND/CAF capabilities. IDEaS is an investment in access to innovators, allowing Canada's military to better tap into the extraordinary talent and ingenuity resident in Canada. IDEaS also regularly draws upon the capacity and personnel of Defence Research and Development Canada (DRDC), DND's national network of science and technology research centres. IDEaS is housed within DND in order to simultaneously utilize the guidance of DND/CAF leadership while tapping into and supporting the growth of Canada's innovation community. ADM (S&T) manages the IDEaS program on behalf of DND.

*Key allied nations have used investments to encourage external innovators to turn their expertise to defence and security challenges. In 2014, the U.S. launched its Third Offset Strategy, committing \$3.6 billion USD/year. In 2016, Australia launched its Next Generation Technologies Fund, funded at \$730 million/10 years, and its Defence Innovation Hub, funded at \$640 million/10 years. Also in 2016, the United Kingdom launched its Defence Innovation Initiative, financed at £800m/10 years. The creation of IDEaS provides Canada with an innovation capability that aligns in mandate with these nations.*

# HOW DOES IDEaS WORK?

IDEaS is built on three fundamental pillars: recruiting innovators (connect), supporting development (develop), and maturing innovative solutions toward adoption (evaluate).

IDEaS is composed of eight independent elements: five elements are designed to directly access the Canadian innovator community, and are facilitated by three enablers.

**IDEaS** has options for **ALL INNOVATORS...**



## DID YOU KNOW?

- *IDEaS aims to decrease the administrative burden that often stifles the development of timely innovations.*
- *IDEaS functions exclusively through CFPs, which ask Canadian innovators to resolve defence and security challenges.*
- *IDEaS eligibility is inclusive to Canadians, including small to large enterprises, academia, not-for-profit organizations, municipal/provincial/territorial organizations, and individual innovators.*

Challenges published are derived from hard problems faced across the entire Department of National Defence and Canadian Armed Forces. We fund innovators using procurement contracts, grants, and contribution agreements.



The **IDEaS PROGRAM** offers many **OPPORTUNITIES** to **ALL TYPES** of **INNOVATORS** so that they can...

## **CONNECT** to other innovators



**Innovators can help refine defence and security challenges**



**Innovator collaboration is encouraged and supported to build capacity**



**DND/CAF subject-matter experts help guide innovators toward solutions**



**Applicants can collaboratively exchange expertise and knowledge**

## **DEVELOP** their innovations



**Innovators can compete for developmental funding**



**Innovators can compete for contest prizes**

## **EVALUATE** their concepts and solutions



**Innovators can test and demonstrate their solutions**



**Innovators can have their solutions assessed by DND/CAF**

## WHAT IS IDEaS' PURPOSE?

IDEaS facilitates DND access to external innovators as a direct complement to DND/CAF's existing investments. The program was designed to enable two-way access, and foster innovation, in order to increase Canadian defence capability and stimulate economic benefit. First, DND will access the extraordinary talent and ingenuity of innovators across Canada, including non-traditional players, seeking to leverage and integrate their expertise. Second, innovators will gain DND's support through funding and guidance to help create capability and capacity for defence and security.

### IDEaS WILL:

- **Access innovators** – approximately 82%\* of all Canadian research and development happens outside of federally funded programs; IDEaS will proactively seek to apply this expertise to defence and security challenges.
- **Support innovators** – each of the IDEaS program elements is designed to encourage innovators to become invested in solving defence and security challenges.
- **Integrate innovator solutions** – the program will find opportunities to integrate innovative solutions into DND/CAF.

IDEaS' performance will be measured by how well its program elements access and foster external innovation, and by how those accessed solutions are adopted by DND/CAF and subsequently deliver new and improved capabilities.

### IDEaS will meet these performance measures in several ways:

Connect DND/CAF challenges with Canadian innovators (industry, academia, individuals, etc.)

Leverage innovators' technological expertise, developments, and innovations

Link innovative solutions to DND/CAF operators

\*Statistics Canada, 2014 Census

# WHAT CAN IDEaS ACCOMPLISH?

*“The IDEaS Program will provide unique opportunities for Canadians to put forward their best solutions on defence and security challenges, and will help put those solutions into the hands of the women and men of the Canadian Armed Forces. This investment will support the growth and expansion of Canada’s innovation community for the next 20 years.”*

*– Harjit S. Sajjan, April 9, 2018*

## GOALS

**In the short term: Steer more external innovator expertise toward DND/CAF challenges.**

- Engage with external innovators across Canada.
- Ensure that DND/CAF innovation challenges provide good development opportunities.
- Streamline the submission/review process where possible.

**In the medium term: Mature relationships/partnerships among innovators and improve the quality of solutions.**

- Demonstrate that Canadian innovators have become actively engaged in solving defence and security challenges.
- Incentivize partnerships and multi-disciplinary solutions.
- Demonstrate that innovator-generated knowledge is being transferred to, and used by, the defence and security community.

**In the long term: Demonstrate increased defence capabilities and increased economic benefits to Canada.**

- Support the growth of the Canadian defence and security innovation community.
- Encourage defence and security communities to adopt innovator-generated solutions.

# WHAT HAS IDEaS DONE SO FAR?



IDEaS has been creating an environment of access to, and for, innovators – within which a number of funding initiatives have been launched under the following program elements: Competitive Projects, Innovation Networks, and Sandboxes. The purpose of this environment is to resolve complex defense and security challenges. Although only launched in April 2018, IDEaS has already had considerable success supporting, and helping to mature, Canada’s innovation ecosystem.

In this first year of operation, many of these achievements and successes can be viewed as milestones with respect to recruitment and support.

## Connected external innovators with existing DND/CAF efforts.

- ✦ Engaged more than 40,000 independent visitors via the IDEaS web page.
- ✦ Encouraged, enhanced, sustained, and supported interdisciplinary research collaboration among academia, for-profit and not-for-profit sectors, and other levels of government.
- ✦ Strengthened a partnership with Public Services and Procurement Canada (PSPC).
- ✦ Implemented simplified application processes for innovators.

## Developed relationships and increased number of partnerships.

- ✦ Stimulated and supported the development of scientific advances in emerging and advanced materials, methods, and state-of-the-art technologies through five direct calls to innovators.
  - Two CFPs for Competitive Projects generated more than 750 proposals, and led to more than 160 contracts with a total value of more than \$26 million.
  - One Request for Information (RFI) for Sandboxes has led to two important events that are scheduled for fall 2019 and Spring 2020.
- ✦ Fostered collaboration among individuals, academia, industry, and other partners via the Innovation Networks CFPs.
  - Two CFPs for Innovation Networks have generated 12 micro-networks with a total valuation of \$18 million for a period of 3 years.



**Evaluated ideas for their contribution to defence capabilities.**

- ✳ IDEaS is currently moving towards this phase with the development and the release of Innovation Assessment & Implementation in early 2019.
- ✳ Established a relationship between Canada’s military needs and innovator ideas.

**DID YOU KNOW?**

*The Competitive Projects element regularly launches CFPs along select themes – seeking successful proposals for funding. The table below provides the distribution of proposals received from our stakeholders for our first two CFPs:*

CATEGORY	CFP 1 SUBMISSIONS	CFP 2 SUBMISSIONS
Academia	21.3%	17.6%
Small & Medium Industry (< 500 employees)	59.6%	64.2%
Large Industry	10.7%	10.9%
Non-Governmental Organizations (NGOs)	4.3%	6.6%

**DID YOU KNOW?**

*The Innovation Networks element has sought proposals in two critical areas – Advanced Materials, and Autonomous Systems.*

More than 100 letters of intent received across two challenges; 43 formal proposals submitted	12 Micro-nets approved for funding	More than 100 Micro-net participants*	Across 5 provinces
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*\*Micro-net participants as of March 2019*

**DID YOU KNOW?**

*The Sandboxes element provides an opportunity for innovators to test and demonstrate their solutions to subject-matter experts/CAF operators.*

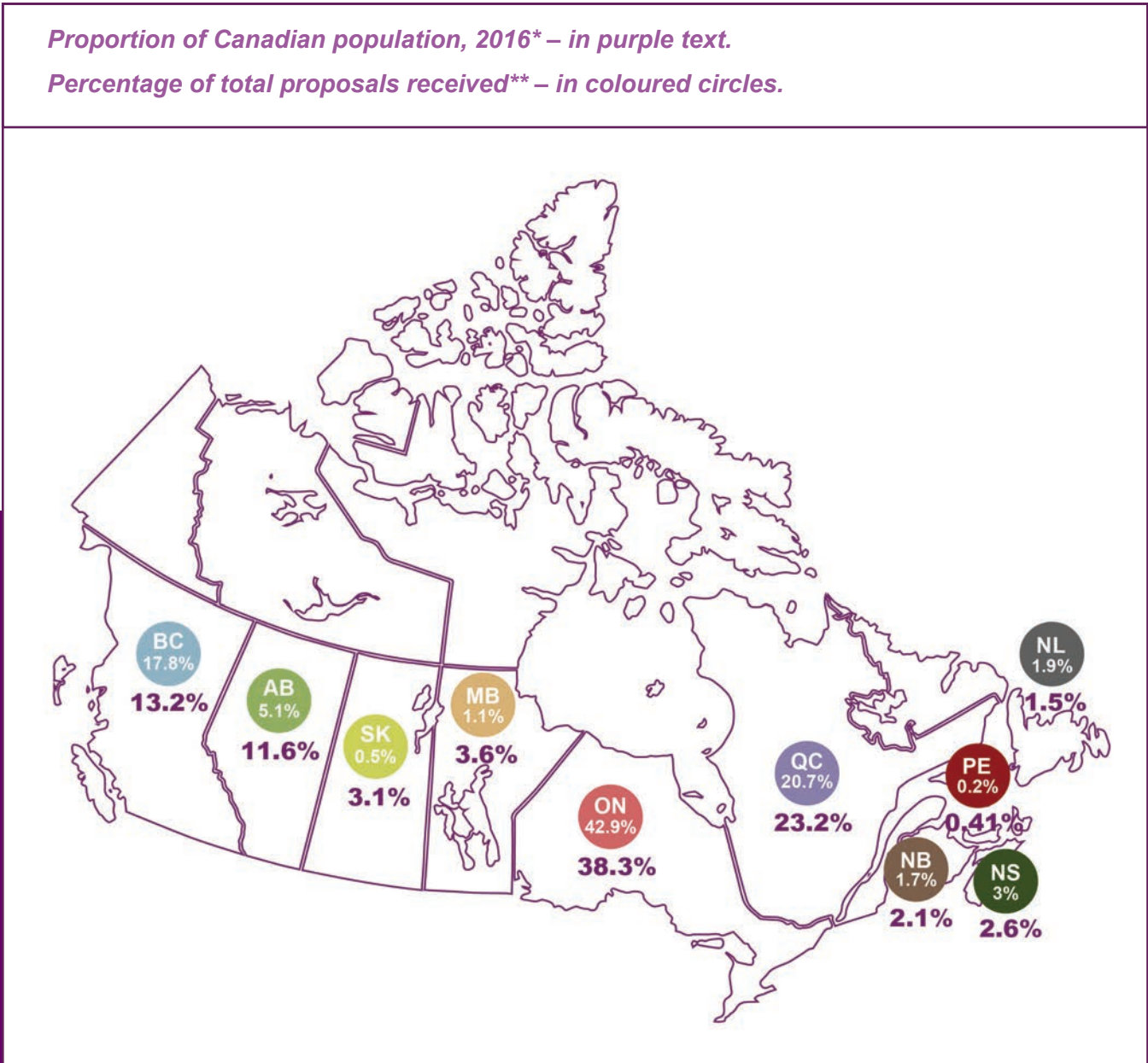
*Our first RFI has led to a Sandbox event that is scheduled for September 2019, related to the Counter Unmanned Aerial Systems challenge. A second Sandbox event, related to the Corrosion Detection in Ships challenge, is slated to occur in the Spring of 2020.*

CHALLENGES	SANDBOX DECISIONS
Counter Unmanned Aerial Systems	September 2019
Corrosion Detection in Ships	Spring 2020

**DID YOU KNOW?**

We are receiving proposals from across the country. The map below shows the provincial distribution of proposals received by the first two Competitive Projects CFPs, as well as provincial proportions of the Canadian population.

Proportion of Canadian population, 2016\* – in purple text.  
 Percentage of total proposals received\*\* – in coloured circles.



\*Statistics Canada, 2016 Census

\*\*Regional distribution will vary over time based on challenge domain

# HOW DOES IDEaS ENGAGE INNOVATORS?

Saskatoon, Moncton, Victoria, and Sherbrooke are only a few of the many Canadian cities, from coast to coast, visited by the IDEaS team during this first year of activity. A key driver of IDEaS' success so far has been a proactive focus on engaging innovators, and attracting and encouraging non-traditional players to join the innovation community. In order to generate innovative solutions across industry, academia, and other organizations, IDEaS has conducted hundreds of meetings, conferences and tradeshows, one-on-one sessions, webinars, and focus groups. IDEaS also uses its website page ([Canada.ca/Defence-IDEaS](http://Canada.ca/Defence-IDEaS)) and subscriber emails to provide program information updates. In addition, IDEaS leverages partnerships with established organizations – such as the Office of Small and Medium Enterprises, the National Research Council, the Industrial Research Assistance Program, and regional development agencies – to extend its reach throughout Canada.

## IDEaS ENGAGEMENT AND OUTREACH



### 2018-2019 highlights

- ✿ Engaged in collaboration with academia, industry, for-profit and not-for-profit sectors, as well as all levels of government.
- ✿ Built a network of more than 3,000 stakeholders.
- ✿ Outreach efforts have helped drive more than 40,000 innovators to the IDEaS website.
- ✿ More than 850 proposals were submitted through five CFPs.
- ✿ More than 170 contracts/contribution agreements have been signed and initiated with Canadian innovators.

## WHAT HAVE WE LEARNED?

As we celebrate the one-year mark of the launch of IDEaS on April 9, 2018, we can reflect on a number of insights which could prove useful to all of IDEaS' partners as we continually seek to improve our program. We are pleased to share our "lessons learned" with you in a spirit of openness and transparency. We also encourage innovators to submit their own observations and suggestions for improvement (DND.IDEaS-IDEeS.MDN@forces.gc.ca) based on their interactions with the program.

### WHAT WORKED WELL?

- ✓ *IDEaS generated significant interest and received strong proposals from Canadian innovators.*
- ✓ *Relationships were created and, in some cases, strengthened between Canadian innovators and defence and security needs.*
- ✓ *IDEaS has helped make DND more 'approachable' and the needs of DND more relatable to innovative thinkers.*
- ✓ *Recruitment and sustained participation of innovators and subject matter experts helped to create awareness and internal 'buy-in' regarding the importance of innovation to DND/CAF.*
- ✓ *Perspectives of, and oversight by, both scientific and operational experts for each challenge proved valuable for program relevance.*
- ✓ *Advance notification of the program's future opportunities can help innovators plan ahead for the actual CFPs.*
- ✓ *Administrative processes are being streamlined, simplified, and reduced.*
- ✓ *Social-media outreach, face-to-face contacts, and branding have helped promote the program to the Canadian innovation community.*

### WHAT COULD BE IMPROVED?

- ➔ *Encourage greater participation by non-traditional innovators through engagement and promotion activities.*
- ➔ *Streamline response times to provide quicker decisions on proposals.*
- ➔ *Sustain engagement of DND/CAF partners in all stages of the challenge process.*
- ➔ *Extend information-sharing outreach within DND/CAF and the Canadian innovation community regarding the program's functions, goals, and needs.*



# WHAT ARE IDEaS' FUTURE PLANS?

Looking forward, the IDEaS team intends to build on the progress and achievements from the program's first year in operation. We will continue to emphasize themes of access and transparency. We will maintain our endeavours to recruit innovators and support innovation. We look forward to increasing our efforts in maturing solutions into tangible defence capabilities. Below are several specific activities we anticipate undertaking in 2019-2020.

## 2019-2020

- ✿ Complete the launch of all eight IDEaS elements.
- ✿ Continue with our regular CFPs with the existing elements.
- ✿ Continue exploring even more flexible and agile contracting mechanisms.
- ✿ Continue and step up our promotion and outreach campaign:
  - Increase the quantity of engagement/ promotion activities and publicize them on the IDEaS web page.
  - Hold the first Innovation Networks Symposium for network participants, and lay the groundwork for the symposium to become a place to discuss all things "IDEaS".
- ✿ Improve IDEaS' online and social-media presence:
  - Develop a web-based dashboard to show IDEaS impact, results, funding.
  - Enhance awareness of IDEaS through informative video vignettes, tutorials to aid innovators to create their submissions, and future-opportunities postings.
- ✿ Enhance metrics:
  - Share innovators' success stories.
  - Improve the ease of submission and participation for innovators.



# HOW CAN YOU CONTACT US?

## FOLLOW. SHARE. SUBMIT.

[@CanadianForces](#) [#DefenceIDEaS](#)

[@CanadianForces](#)

[DND.IDEaS-IDEeS.MDN@forces.gc.ca](mailto:DND.IDEaS-IDEeS.MDN@forces.gc.ca)

[Canada.ca/Defence-IDEaS](http://Canada.ca/Defence-IDEaS)



## ACKNOWLEDGEMENTS

The IDEaS team would like to thank the following individuals and organizations for their contributions to this report, and for their ongoing efforts to support innovation for the benefit of the defence, safety, and security of Canadians. This report and – more importantly – IDEaS' ongoing augmentation of DND/CAF capabilities would not be possible without the expertise and advice generously provided by the following:

- Department of National Defence
- Defence Research and Development Canada
- Public Services and Procurement Canada
- Treasury Board of Canada Secretariat
- Other Government Departments
- Allied programs
- Canadian Innovators from all organizations



