


# What Implementation for Continuous Capability Sustainment?

***Introduction and Overview***

by William Richardson

March 2025

# POLICY PERSPECTIVE

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The Department of National Defence's (DND) Materiel Group is currently piloting and promoting the Continuous Capability Sustainment Initiative (CCS) in order to improve the Canadian Armed Forces' (CAF) ability to maintain new and existing military capabilities at the speed of operational and technological relevance. According to the Government of Canada (GoC), "CCS seeks to identify ongoing investments in technology upgrades over the in-service phase of a capability to ensure [that CAF] equipment remains technologically relevant, fit for purpose, and aligned with the extant high level mandatory requirements."[1] Today, there is broad recognition both within and outside the Defence Team that Canada's legacy defence procurement and sustainment processes of complex and protracted capital projects, regular in-service support contracts, major mid-life platform upgrades, and service-life extension programs are no longer fit for purpose.[2] In a highly uncertain international security environment, our allies are rapidly deploying new data-driven military capabilities and increasingly upgrading existing ones at shorter intervals, while industry continues to innovate at pace, and particularly in the areas of artificial intelligence (AI), quantum computing, cyber, sensing, and uncrewed systems.[3]

Canada's defence procurement approach is still largely based around a legacy model of acquiring weapons systems and then conducting a mid-life upgrade, with annual maintenance and servicing. This approach is governed in part by the availability of funding to introduce new capabilities rather than maintain existing capabilities, with the former using different funding streams (colours of money in government parlance) and subject to different rules about its expenditure. The result is that the introduction of new technology into the CAF via weapons systems occurs in just two basic time periods – when a system or platform is purchased and when it is substantially upgraded at midlife.[4] In contrast, the desire with CCS is "to provide DND with the flexibility to integrate the latest technology and innovations during regular maintenance cycles instead of waiting years to do a minor upgrade."[5]

The appeal of moving to a new model is conceptually significant, especially in the face of accelerating technological trends inside and outside of defence that make keeping pace with

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[1] Procurement: House Standing Committee on National Defence (NDDN) - Main Estimates 2023-24, (Ottawa, ON: Government of Canada, 2023).

[2] *Our North Strong and Free: A Renewed Vision for Canada's Defence*, (Ottawa, ON: Government of Canada, 2024)., 21.; Procurement: House Standing Committee on National Defence (NDDN) - Main Estimates 2023-24, Short.

[3] See William Richardson et al., *Toward Agile Procurement for National Defence: Matching the Pace of Technological Change*, Canadian Global Affairs Institute (Ottawa, ON: Canadian Global Affairs Institute, 2020), https://www.cgai.ca/toward_agile_procurement_for_national_defence_matching_the_pace_of_technological_change.; Elly Thompson, *Optimizing Procurement for Great Power Competition: 2023 Annual Procurement Conference Report*, Canadian Global Affairs Institute (Ottawa, ON: Canadian Global Affairs Institute, 2024), https://assets.nationbuilder.com/cdfai/pages/5437/attachments/original/1706901763/Optimizing_Procurement_for_Great_Power_Competition_2023_Annual_Procurement_Conference_Report.pdf?1706901763.

[4] Not all projects follow this simple model. The Aurora aircraft, for example, has been undergoing a series of Incremental Modernization projects under the Aurora Incremental Modernization Project (AIMP) since 1999, but this is not the norm, and more projects adhere to the acquisition and midlife upgrade model than do not. See "CP-140 Aurora fleet modernization and life extension," Government of Canada (Ottawa, ON), https://www.canada.ca/en/department-national-defence/services/procurement/cp-140-aurora.html.

[5] "Government response to the Standing Committee on National Defence report, entitled: *Report 12 – A time for change: reforming defence procurement in Canada,"* 2024, Government of Canada (Ottawa, ON), https://www.ourcommons.ca/content/Committee/441/NDDN/GovResponse/RP13331316/441_NDDN_Rpt12_GR_PDF/441_NDDN_Rpt12_GR-e.pdf, 7.

technological evolution with a legacy acquisition plus midlife upgrade model increasingly difficult. Switching to a new model will, however, entail a number of adjustments to existing governance models, procedures, financial planning, fleet management approaches and other considerations, all of which entail trade-offs of one kind or another. Furthermore, while the approach is conceptually appealing, and there are multiple different examples of its potential applicability within the CAF's acquisition portfolio, no empirical data was available to suggest precisely how many projects could benefit from the change in approach. This research project is an effort to assess how potentially useful a CCS approach could be within the defence portfolio by collecting empirical data to assess how many projects are assessed as potentially benefitting from a changed approach.

The DND Materiel Group has four overarching parameters for CCS: capability, timeliness, overall cost, and human resource requirements. Up to 20 percent of the projects for which the Materiel Group is responsible could reportedly be candidates for CCS in the future.[6] CCS is also intended to increase the flexibility and autonomy of the Materiel Group in addressing evolving force requirements and priority capabilities; in order to eventually implement the initiative at scale, the Material Group is first working to build the credibility of CCS in through-life sustainment costing. There is recognition that a more fully realized CCS initiative could help break down longstanding procurement silos within the Defence Team. Integrating Materiel Group personnel earlier in the procurement project cycle could not only serve to socialize CCS within the CAF force development organizations, but also instil a greater focus on through-life capability, affording project personnel an understanding of where future technology insertions may be needed in a particular platform or system, and informing procurement decisions that facilitate more efficient and strategic sustainment activities. On this basis, CCS could eventually create the conditions for permanently staffed capability management teams within the CAF. Such teams might involve both force development and in-service support personnel. Given staffing levels and operational demands, the CAF is currently challenged to keep personnel working on all of its different procurement projects concurrently. If CCS were applied across specific CAF fleets, the services could stand up dedicated capability management teams to build specialized skills and corporate memory, enabling faster technology refreshes and better understandings of emerging requirements, industry trends, and potential capability upgrades.

Despite Canada's recent commitment to pilot CCS in *Our North, Strong and Free: A Renewed Vision for Canada's Defence* (*ONSAF*), there is little clarity on precisely how CCS will be implemented and how it might affect the Defence Team's current portfolio of projects.[7] An empirical assessment of where CCS could be applied for maximum efficiency is missing – a gap this series of papers seeks to fill.

[6] Interview with ADM Materiel subject matter experts.
[7] *Our North, Strong and Free* , 21.

*The Study*

This series of reports will leverage survey data solicited from the CAF and developed in partnership with the Materiel Group team working on CCS design and implementation. First, we sent a series of yes/no questions asking each service's force development team to indicate whether CCS would be applicable in a given capital project or support contract. The relevant CAF force development officials answered these questions on a per project basis and provided optional qualitative context. Survey questions were grouped into the following three categories of CCS indicators: regulatory changes, interoperability requirements, and future planning. Each of these categories will represent an important group of related considerations in the future determination of a particular project's suitability for CCS. A total of 14 different CCS indicators were grouped into these three categories; individual CCS indicators can be viewed in Figure 2 below and also in the published survey questionnaire. Following the gathering of survey data, we met with the DND Materiel Group and the individuals responsible for requirements within each service to gain additional qualitative insights into their respective approaches to CCS. The results will be represented on a CAF-wide basis and then with individual Policy Perspectives analyzing each service's CCS survey results.

*The Bottom Line, Up Front*

Our survey and interview data affirm a general recognition within the CAF that CCS could be a useful tool in future force development and in-service support activities, and particularly around obsolescence management and speed of execution. However, further efforts are reportedly needed to articulate and socialize the concept within the CAF; uncertainty regarding how and where CCS might be implemented going forward remains. Concerns include a lack of tailored CCS costing, funding, and governance mechanisms. While the CAF is currently pursuing CCS pilot projects using innovative funding approaches, such approaches are not sustainable as they have not involved the injection of incremental funding. The CAF possesses many equipment fleets requiring CCS-like obsolescence management activities, but it has no appropriate mechanism to carry out these activities in a sustainable and efficient manner. Without a dedicated CCS funding model, the CAF services must default to the major project process or simply delay needed upgrades. Our meetings highlighted a significant interest in the development of a new CCS funding process sitting between Vote 1 (operations) and Vote 5 (capital) funds and that also involves the injection of new funding. Simply reallocating funds from existing in-service support arrangements, for example, could negatively affect force readiness levels. One potential CCS funding workaround, now being employed in select procurement projects, is to try to carve out funds in future years for upgrades that will happen after project closure using CCS. However, this novel approach has not yet been formalized in the Project Approval Directive (PAD) or the defence project handbook and would not apply to existing capabilities. Flexible costing models, simplified Treasury Board submissions, and further development of the minor projects section of the PAD could also serve to support future applications of CCS. If the Defence Team is looking to

implement CCS on a greater scale, it will have to carefully address these funding and governance considerations.

*Methodology and Study Limitations*

The methodology for the project was developed through a series of engagements with Materiel Group staff. In these discussions, a number of specific problems that the current approach to capability introduction is ill suited to delivering (such as rapid technological advance, regulatory compliance, and interoperability considerations) were itemized, and then developed into a list of project characteristics or indicators. These CCS indicators were then used to produce a list of yes/no questions, contained in the survey reproduced below. The research team then engaged with the Force Development organizations of the RCN, RCAF, and CA to discuss the survey, and requested that they review their project portfolios to assess their projects and see which might have the applicable attributes. Specifically, we asked that the teams fill out a worksheet in an attached excel document and create individual worksheets for each of the projects or potential projects that the team briefed at the 2024 CADSI Outlook. The research team requested that the force development teams assess the projects briefed at the 2024 CADSI Outlook, rather than ask them to simply assess their entire portfolio or look for publicly available data for several reasons.

First, comprehensive, representative and current public data is unavailable. This is especially the case for projects announced in the April 8, 2024, *Our North, Strong and Free*. Second, at any given time there are a number of projects or potential defence projects with varying levels of formal approval by the GoC, DND, and the capability sponsors (of which the three services are the largest). In other words, the parts of the CAF and DND that work on developing future capabilities for the military are at any given time focusing efforts on capabilities that have received full government policy approval and funding, inclusion in DND's approved Investment Plan, only internal DND approval and/or funding, or that might simply be capability proposals of the respective sponsor that only that sponsor's organization deem important, but which have not yet received any formal level of approval. Projects that have not been approved within DND may proceed and become fully approved projects, or they might not. But projects that have not (yet) received formal departmental approval would not be entered into the departmental database – DRMIS. At the same time, DND has a multitude of projects at various stages of maturity – 369 are included in the most recently approved Defence Investment Plan. Obtaining and processing standardized information across the breadth of this dynamic portfolio was judged by the research team to be impractical.

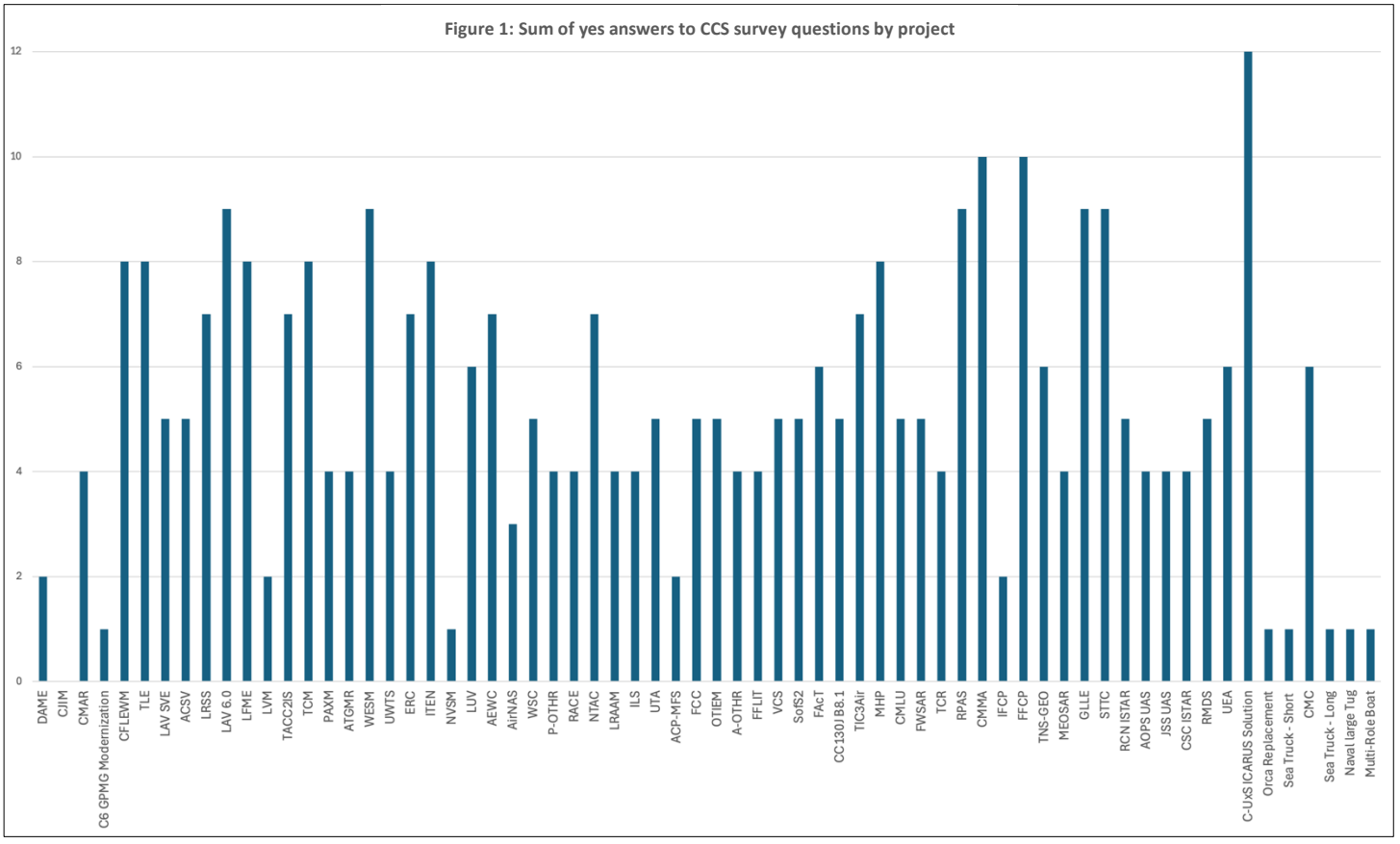
Based on this landscape, obtaining information briefed to the CADSI Outlooks, an annual, longstanding forum where the DND/CAF provides industry with information about its forthcoming and in progress force development and procurement efforts, was viewed as the best option for identifying a reasonably comprehensive, yet meaningful list of projects to evaluate for potential CCS utility. The projects briefed to the Outlooks undergo an internal selection process for their selection and their files are reviewed and current. These projects therefore represent a sample of the total project universe that has been pre-screened for its importance and for the releasability of information, which expedited the research team's ability to access usable data.

While we judge our research method to be effective and efficient, we cannot be certain of the percentage of total active CAF projects or potential projects captured. Furthermore, the projects

included differ significantly in functional area, scope, budget, and timeframe. Many of the projects are at different phases; in some cases, respondents indicated that specific projects were not sufficiently mature to assess the presence of a CCS indicator, but indicators could become visible as projects evolve. As already suggested, there is little published information on a number of the surveyed projects, making it difficult to assess their maturity or development phase. For a number of reasons, including security classifications in a few instances, it is difficult to draw from a consistent data holding. It is highly likely that such differences affected survey results and would also factor into future CCS determinations. Notwithstanding these caveats, the CAF-wide brief below and three separate element-specific briefs draw on survey responses and interviews with the relevant CAF requirements directorates to evaluate how CCS might be implemented by the Defence Team on a larger scale going forward.

*Results: An Overview*

The 66 surveyed CAF projects are analyzed together here. CAF-wide observations and brief comparisons between the different responses of the three CAF services are presented below.



1. The 14 CCS indicators listed in Figure 2 and discussed throughout this series were identified a total of 340 times across the 66 surveyed CAF projects. Out of the 340 times the various indicators appeared, 51 indicators appeared across the 13 surveyed RCN projects, 172 indicators appeared in the 31 surveyed RCAF projects, and 117 indicators appeared in the 22 surveyed CA projects (see published project list for abbreviations).

2. Figure 1 identifies the RCN Maritime Counter-Unmanned Systems (C-UxS) ICARUS Solution as the CAF project with the greatest number of CCS indicators, at a total of 12. It is followed by the RCAF Future Fighter Capability Project (FFCP) and RCAF Canadian Multi-Mission Aircraft (CMMA), with 10 indicators each. The RCAF Remotely Piloted Aircraft System (RPAS), RCAF Griffon Limited Life Extension (GLLE), RCAF Strategic Tanker Transport Capability (STTC), CA Light Armoured Vehicle III Upgrade (LAV 6.0), and CA Weapons Effects Simulation Modernization (WESM) all show 9 CCS indicators. All of these capabilities could be prime candidates for CCS.

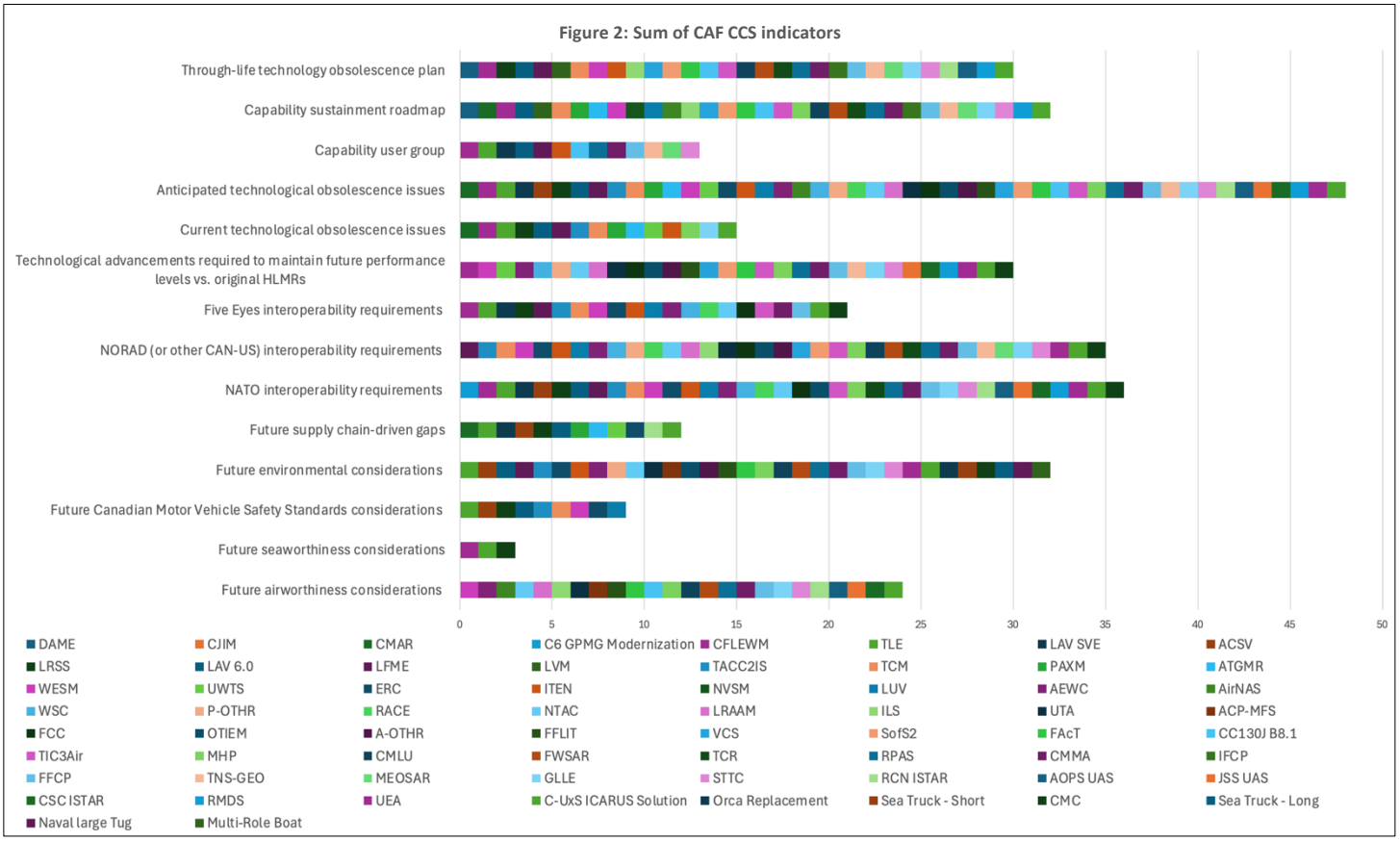
3. The mean number of CCS indicators for all surveyed CAF projects is 5.2, the median number of indicators is 5, and the mode is 4. The mean number of visible CCS indicators for the surveyed RCN projects is 3.9, the median is 4, and the mode is 1. The mean number of visible CCS indicators for the surveyed RCAF projects is 5.5, the median is 5, and the mode is 5. The mean number of CCS indicators for the surveyed CA projects is 5.3, the median is 5.5, and the mode is 8. CA and RCAF capabilities would appear to be the most conducive to CCS activities, followed by RCN capabilities.

4. 98 percent of all surveyed projects (65 projects) exhibited at least 1 CCS indicator. 80 percent of all surveyed projects (53 projects) exhibited at least 4 CCS indicators. 30 percent of all surveyed projects (20 projects) exhibited at least 7 CCS indicators. Finally, 4.5 percent of all surveyed projects (3 projects) exhibited at least 10 CCS indicators. The identification of multiple CCS indicators across the surveyed projects affirms the suitability of CCS for CAF sustainment activities.

5. Figure 2 shows that the most prevalent CCS indicator across all surveyed CAF projects is anticipated technological obsolescence issues requiring future investment, with 73 percent of all surveyed projects (48 projects) exhibiting this indicator. The second and third most prevalent CCS indicators are NATO interoperability requirements requiring future investment and NORAD interoperability requirements requiring future investment, respectively. Both of these indicators were identified in slightly more than half of all surveyed projects. CCS activities could be most effective and efficient if tailored to these important areas.

6. The most prevalent category of CCS indicators is future planning, with its indicators identified 168 times across all surveyed CAF projects, representing 49 percent of all visible indicators. The future planning category includes the first 6 CCS indicators listed in Figure 2. The interoperability requirements category had its CCS indicators identified 92 times, representing 27 percent of all visible indicators. The interoperability requirements

category includes the 3 interoperability indicators listed in Figure 2. Finally, the anticipated regulatory changes category had its indicators identified 80 times, representing 24 percent of all visible indicators. The anticipated regulatory changes category includes the last 5 CCS indicators listed in Figure 2. These findings suggest that CCS could initially be implemented in support of future planning across the CAF project portfolio (and particularly in support of technology insertion activities), and subsequently in support of evolving interoperability requirements and changing regulations.




7. Within the future planning category of CCS indicators, RCAF projects are the most likely to possess a through-life technology obsolescence plan (55 percent of surveyed RCAF projects) and capability sustainment roadmap (61 percent of surveyed RCAF projects) at this time, followed by CA projects (41 percent and 50 percent, respectively), and RCN projects (31 percent and 15 percent, respectively). Anticipated technological obsolescence issues requiring future investment are expected in a similar portion of surveyed RCAF and CA projects (77 percent each), compared to 54 percent of RCN projects containing this particular indicator. Current technological obsolescence issues requiring investment are by far the most prevalent for the CA (55 percent of surveyed projects), versus the RCN and RCAF (8 percent and 6 percent of surveyed projects, respectively).

8. Within the interoperability requirements category of CCS indicators, NATO interoperability requirements requiring future investment are the most prevalent indicator for both the RCN and CA, while NORAD interoperability requirements requiring future investment are the most common indicator for the RCAF.

9. Within the anticipated regulatory changes category of CCS indicators, future environmental considerations requiring future investment are the most prevalent indicator across all surveyed projects (48 percent of surveyed CAF projects). Within this category, the same indicator is the most prevalent for the RCN (62 percent of surveyed RCN projects), future airworthiness considerations are the most prevalent indicator for the RCAF (58 percent of surveyed RCAF projects), and future supply chain-driven gaps are the most prevalent indicator for the CA (45 percent of surveyed CA projects). Future environmental considerations are reportedly more prevalent for the RCAF (55 percent of surveyed RCAF projects) than for the CA (32 percent of surveyed CA projects). Compared to the CA, future supply chain-driven gaps are not particularly prevalent for the RCN (15 percent of surveyed RCN projects) and RCAF (0 percent of surveyed RCAF projects).

# About the Author

***William "Will" Richardson*** *is a PhD candidate in Political Science at Carleton University. He specializes in International Relations and Public Policy. His Doctoral thesis will examine the intersection of Five Eyes military cooperation, emerging technologies and defence procurement. Will completed his MA at the Norman Paterson School of International Affairs at Carleton University in 2020. His MA thesis examined Canada's Future Fighter Capability Project and the role of interoperability in Canadian defence policy. Will also works as a Consultant at Space Strategies Consulting Limited, where he prepares research papers, concept papers and oral briefings on advanced aerospace concepts, military doctrine, emerging technologies and the commercial space sector for clients in the public and private sectors. Will has also worked as a political and security desk officer on several geographic desks at Global Affairs Canada, during which time he produced strategic advice, research reports, and briefing documents for use by the Prime Minister, Cabinet Ministers, and senior departmental officials. Will is passionate about history and aviation; and is also a keen cyclist and hiker.*

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