TRIPLE HELIX

What Implementation for Continuous Capability Sustainment?

Study of the Canadian Army

by William Richardson

March 2025

POLICY PERSPECTIVE

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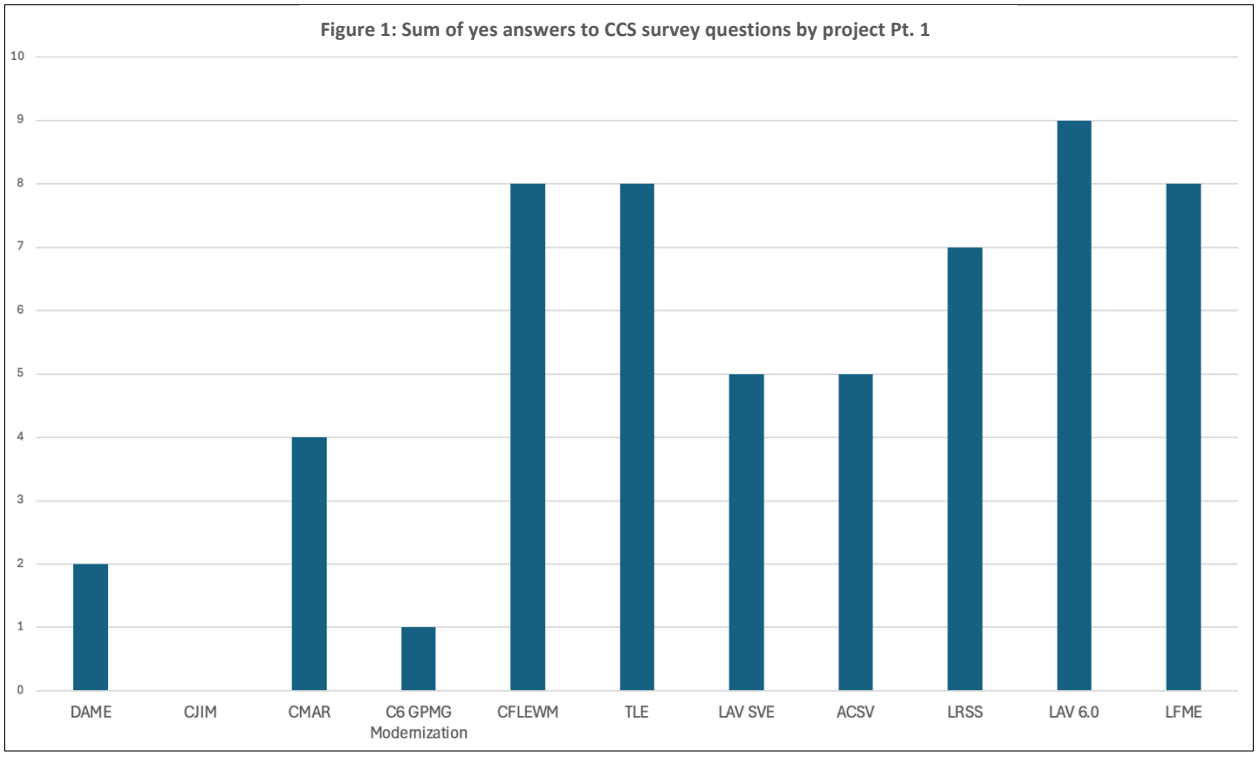


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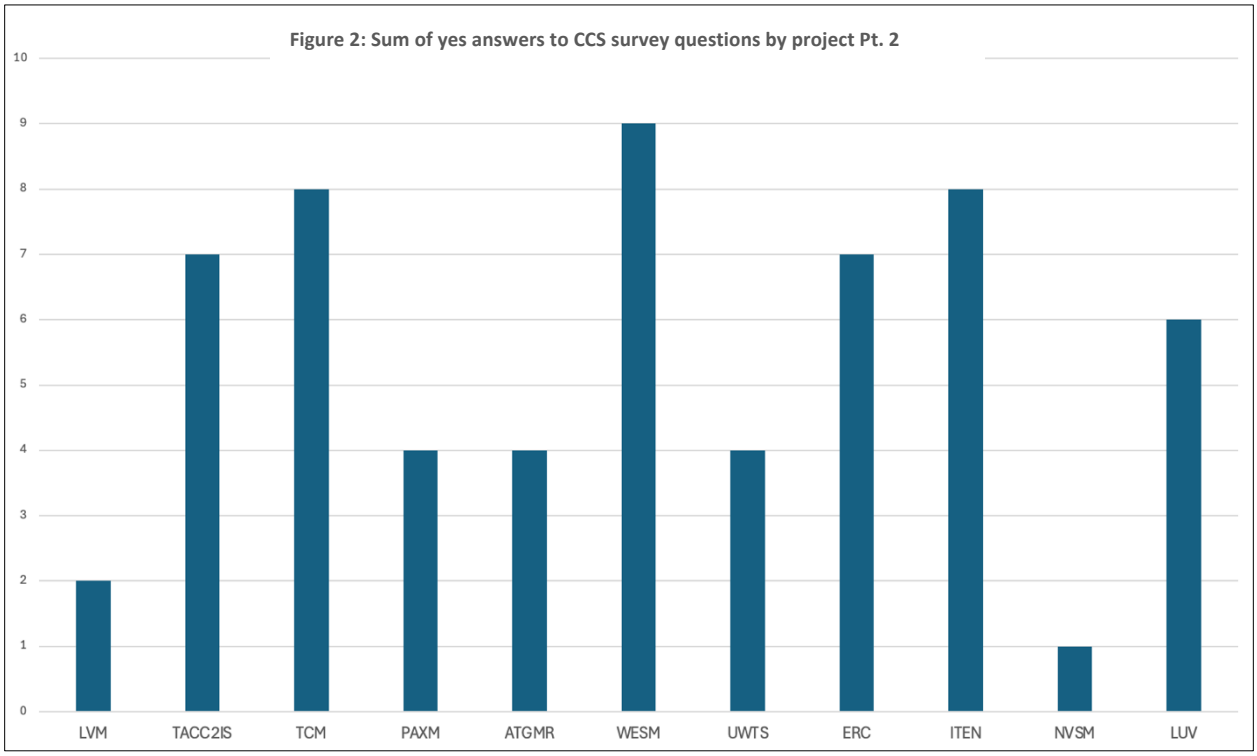
This piece is part of a study examining how a continuous capability sustainment (CCS) approach will affect Canadian Armed Forces (CAF) projects. This paper outlines the application of CCS for Canadian Army (CA) surveyed projects.

This paper examines 22 current CA projects, which are at different project phases (see Annex). Survey results are first presented and analyzed together, then by project, and finally by category. This trifurcated approach is intended to show which projects may be most suitable for CCS both in general and in specific categories, and to provide greater granularity on the appearances of individual CCS indicators in the survey results.



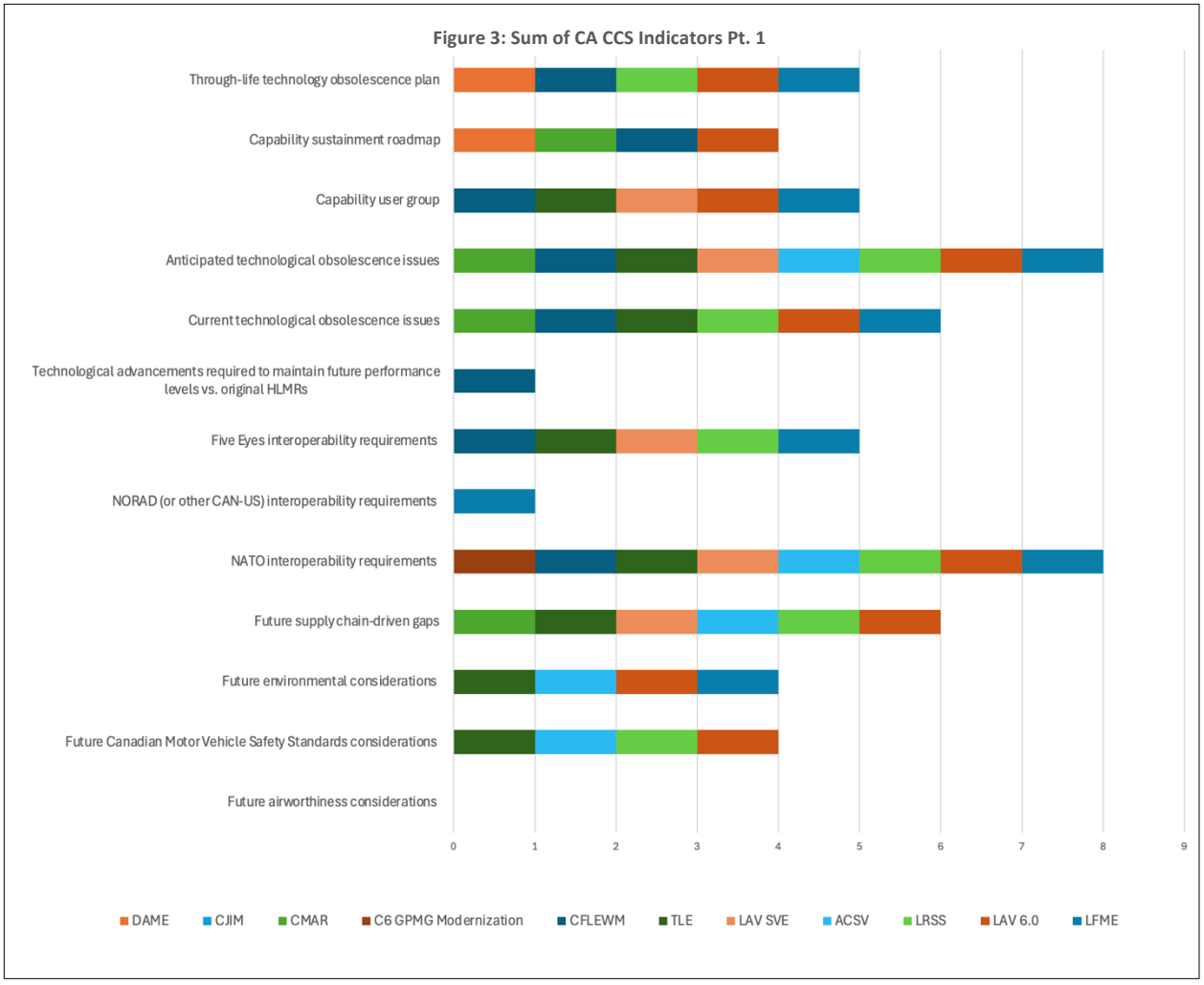
Figures 1 and 2 present the CCS indicators by CA project. Our assumption is that projects with higher CCS indicator scores may be more suitable at this time for through-life CCS. It is important to note, however, that projects in a more advanced project phase (like the Light Armoured Vehicle Reconnaissance Surveillance System, which is in implementation) may score higher in Figures 1 and 2 because more analysis and future planning has taken place. The survey data suggests that LAV 6.0, which represents the fourth generation of the CA's LAV, is well suited to through-life CCS; as already stated, this project is currently a CCS pilot project. LAV 6.0 represents a major data-enabled and multi-use capability for the CA. It is intended to be closely integrated with joint and allied partners on operations. The only other surveyed project to present nine CCS indicators

(out of a possible 13) is Weapons Effects Simulation Modernization (WESM). This project leverages complex computer hardware and software, including instrumentation and simulation equipment, to "increase the realism of joint collective training exercises."[1]

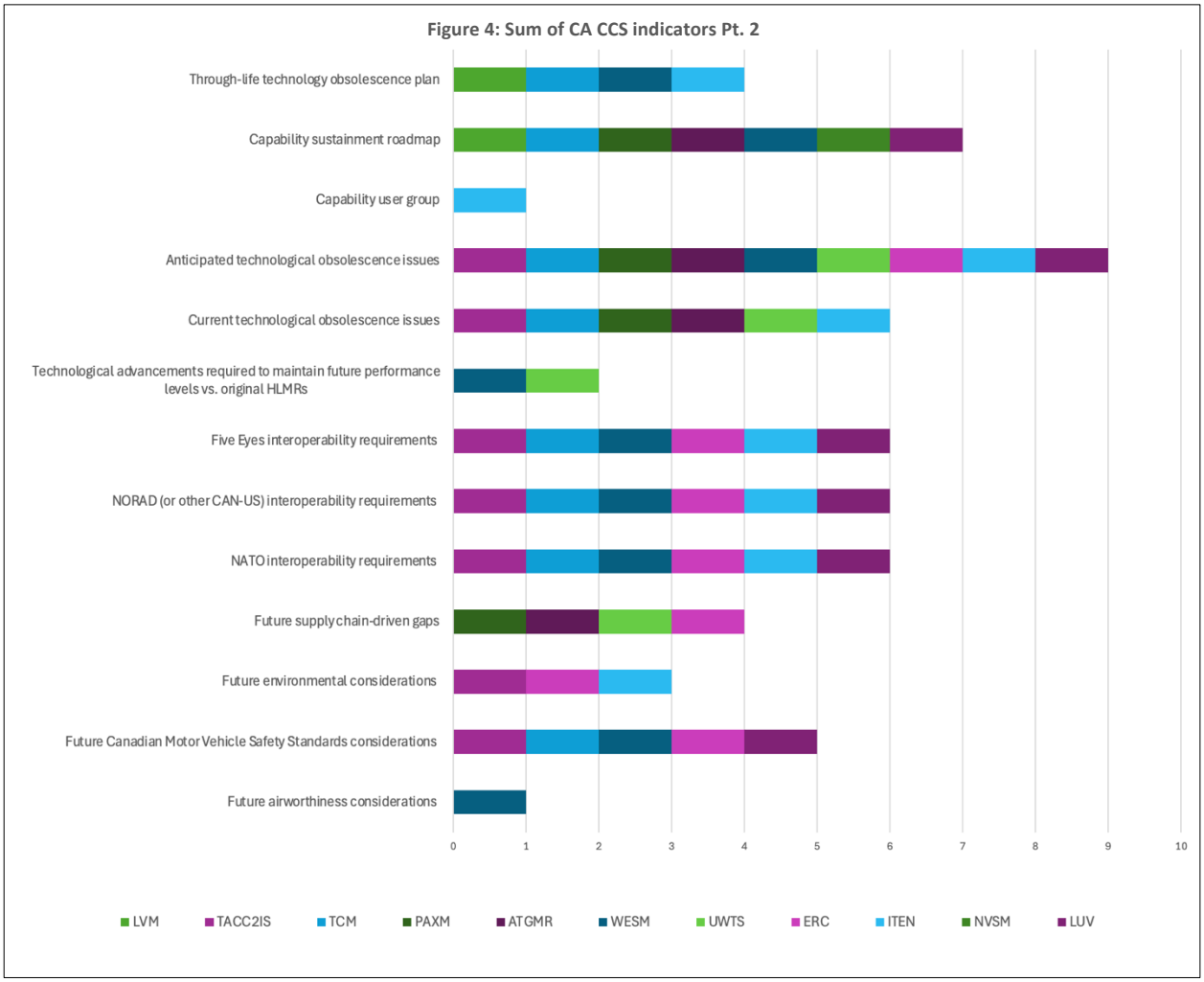


It will "take advantage of technological advances."[2] The Canadian Forces Land Electronic Warfare Modernization (CFLEWM), Tank Life Extension (TLE), Live Fire Monitoring Equipment (LFME), Tactical Communication Modernization (TCM), and Integrated Training and Experimentation Network (ITEN) each present eight different CCS indicators. Each of these projects involve complex, data-enabled systems, digital connectivity, and systems interoperability with joint and allied partners.

[1] "Weapons Effect Simulation Modernization," Defence Capabilities Blueprint (Ottawa, ON: Government of Canada, 2023), https://apps.forces.gc.ca/en/defence-capabilities-blueprint/project-details.asp?id=1271.
[2] Ibid.

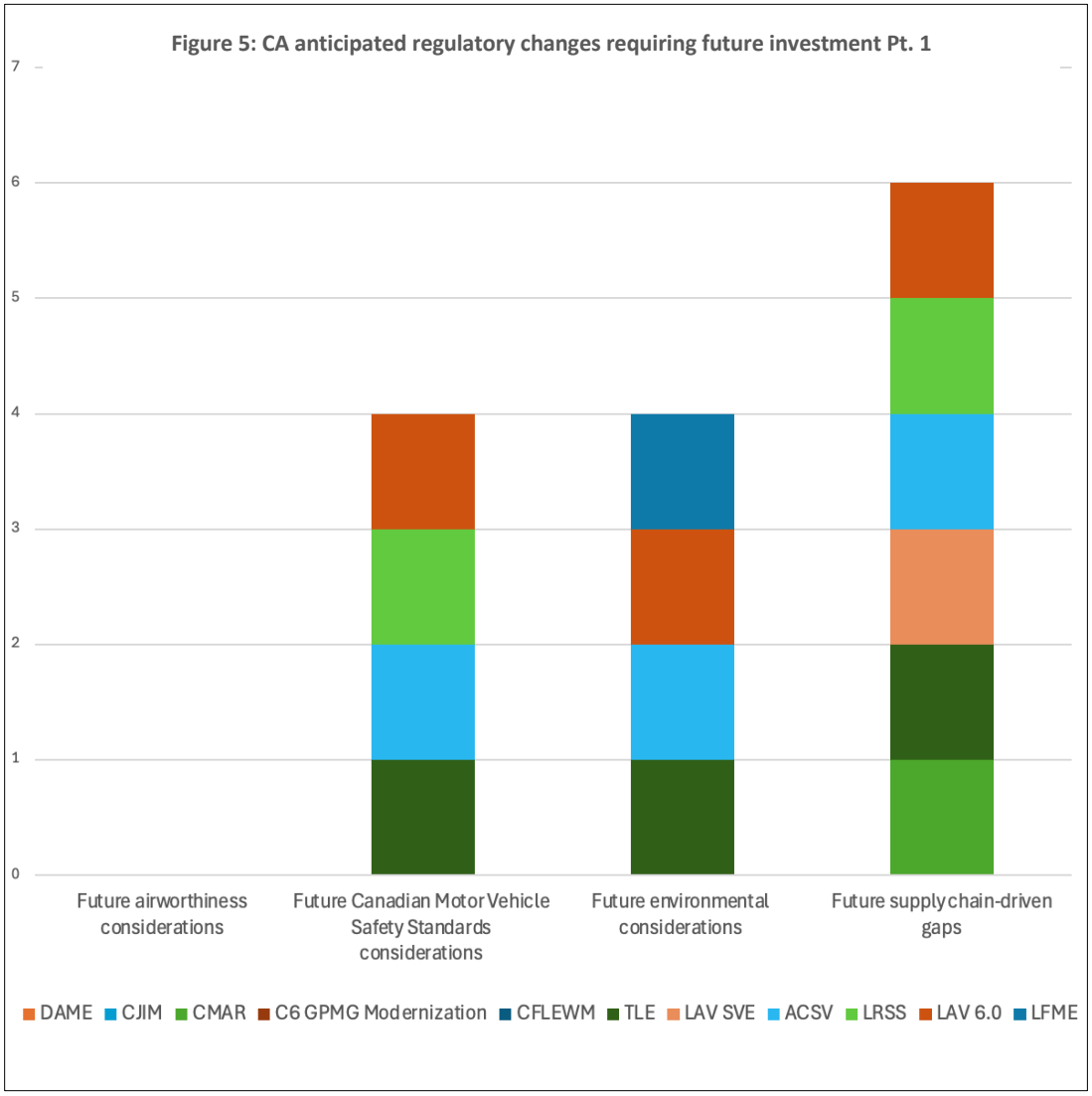


Figures 3 and 4 present all CA "yes" responses. They also highlight the CCS indicators which appear across the most projects. Future technological obsolescence issues are expected in just over 77 percent of surveyed projects, evolving NATO interoperability requirements are expected to require future investment in nearly 64 percent of surveyed projects, and technological obsolescence issues are currently being experienced in half of the surveyed CA projects. Similar to RCAF and RCN projects, this data suggests that CCS may be most effective in helping to ensure that future CA capabilities avoid technological obsolescence issues and continue to satisfy evolving allied interoperability requirements. In this context, CCS could potentially be employed to useful effect in through-life technology obsolescence plans, which have been developed for nine out of 22 (or roughly 41 percent) of CA projects surveyed. Survey responses also indicate that the CA intends to develop such plans for Weapons Effects Simulation Modernization (WESM) and Unit Weapons Training System (UWTS). While the Tank Life Extension (TLE) does not possess such a plan, the project nonetheless includes periodic technological refreshes.

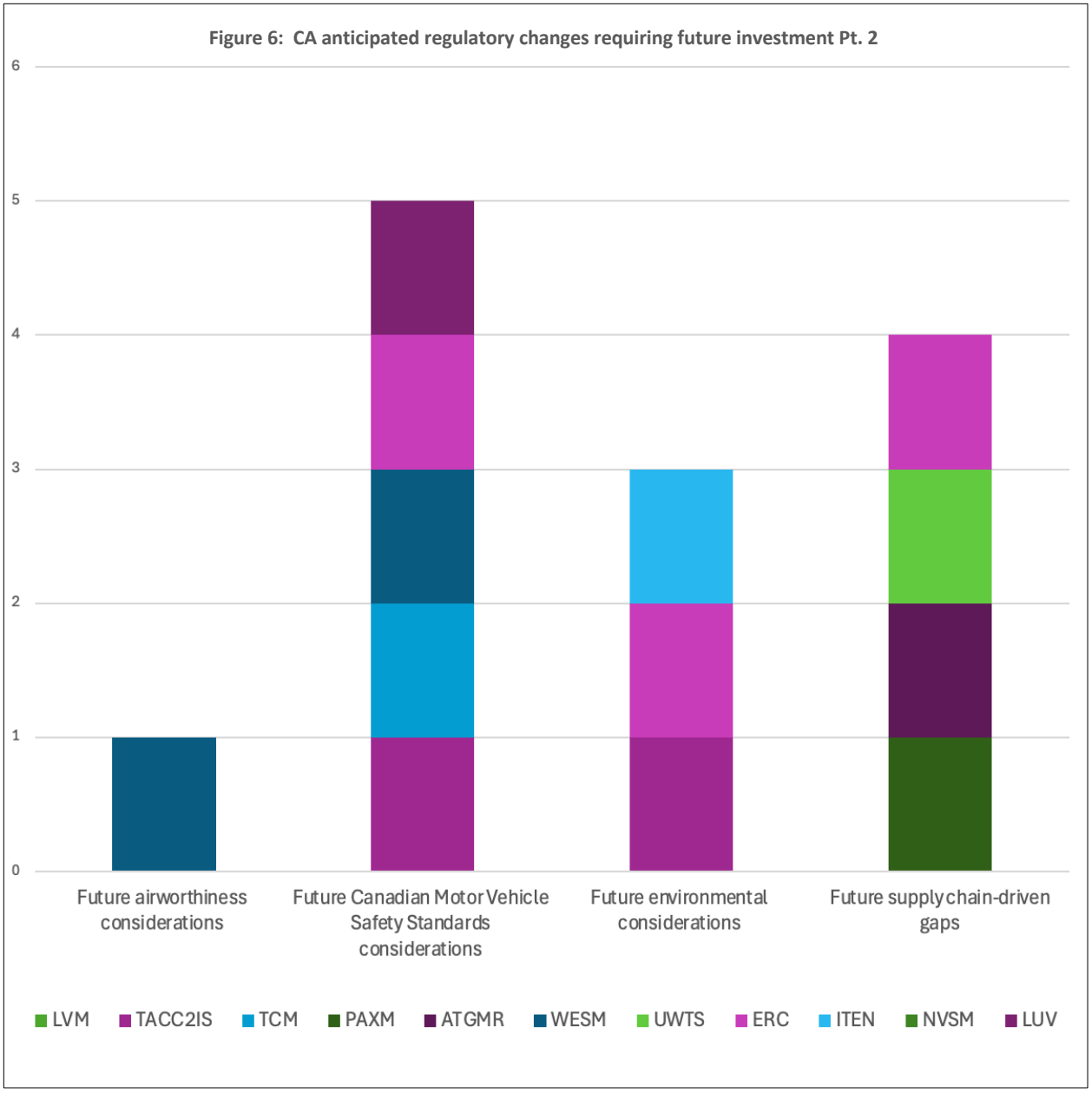


Finally, LAV 6.0 is a CCS pilot project; its technology obsolescence plan (counted among the aforementioned nine projects) is directly incorporated into the project's CCS roadmap. Through-life technology obsolescence plans and capability sustainment roadmaps could eventually both be developed and maintained by specialized capability management teams under a CCS model.

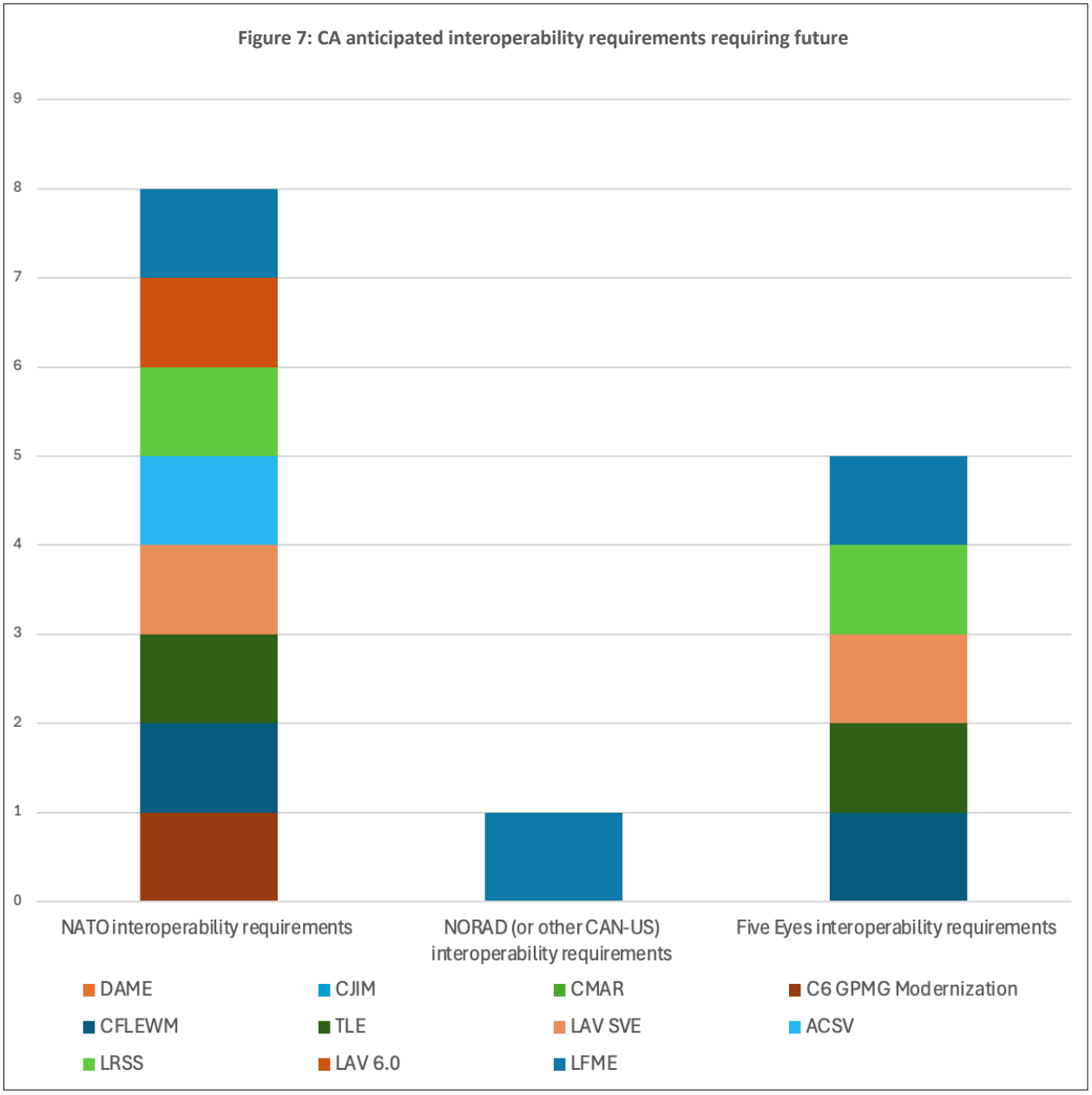
Figures 5 and 6 highlight the regulatory changes category of CCS indicators. Five percent of surveyed projects have future airworthiness considerations likely to require future investment, 41 percent have future Canadian Motor Vehicle Safety Standards considerations, 32 percent have future environmental considerations, and 45 percent of projects are assessed as at risk of facing future supply chain-driven gaps.



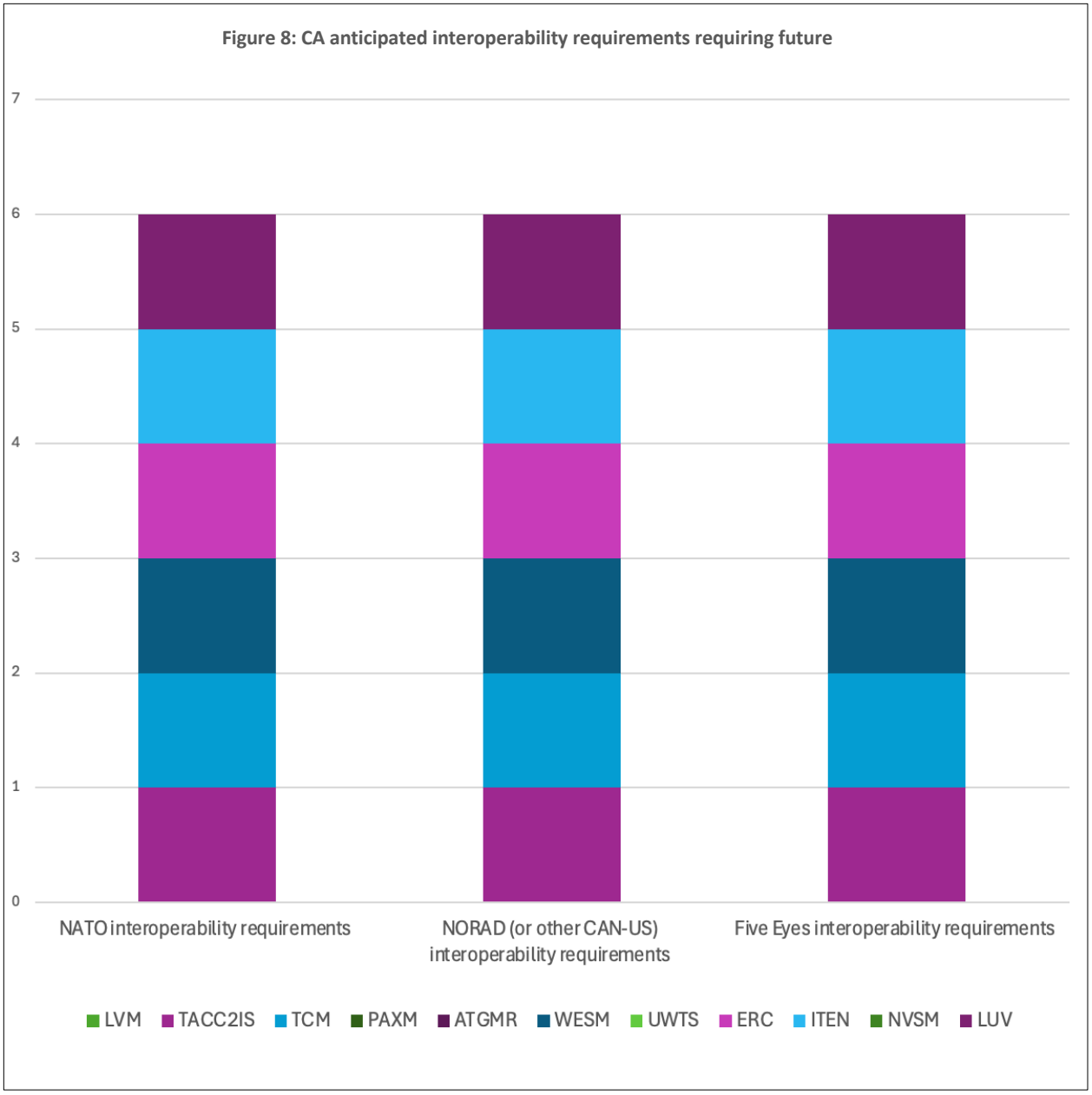
The land fleet decarbonization plan is expected to affect CA vehicle fleets in the future. According to qualitative survey responses, supply chain gaps are "always a risk," and particularly for those projects involving international suppliers. Certain CA projects, including the Light Armoured Vehicle Reconnaissance and Surveillance System (LRSS) and Anti-tank Guided Missile Replacement (ATGMR), employ "a number of key sub-systems not available in Canada," while others like the Unit Weapons Training System (UWTS) and Tank Life Extension (TLE) employ platforms or systems in high demand internationally, which can constrain supply chains. CA CCS planning could prioritize supply chain access.



Figures 7 and 8 highlight the interoperability requirements category of CCS indicators. 64 percent of surveyed projects anticipate evolving NATO interoperability requirements requiring future investment, while half (11) of surveyed projects anticipate evolving Five Eyes interoperability requirements requiring future investment.

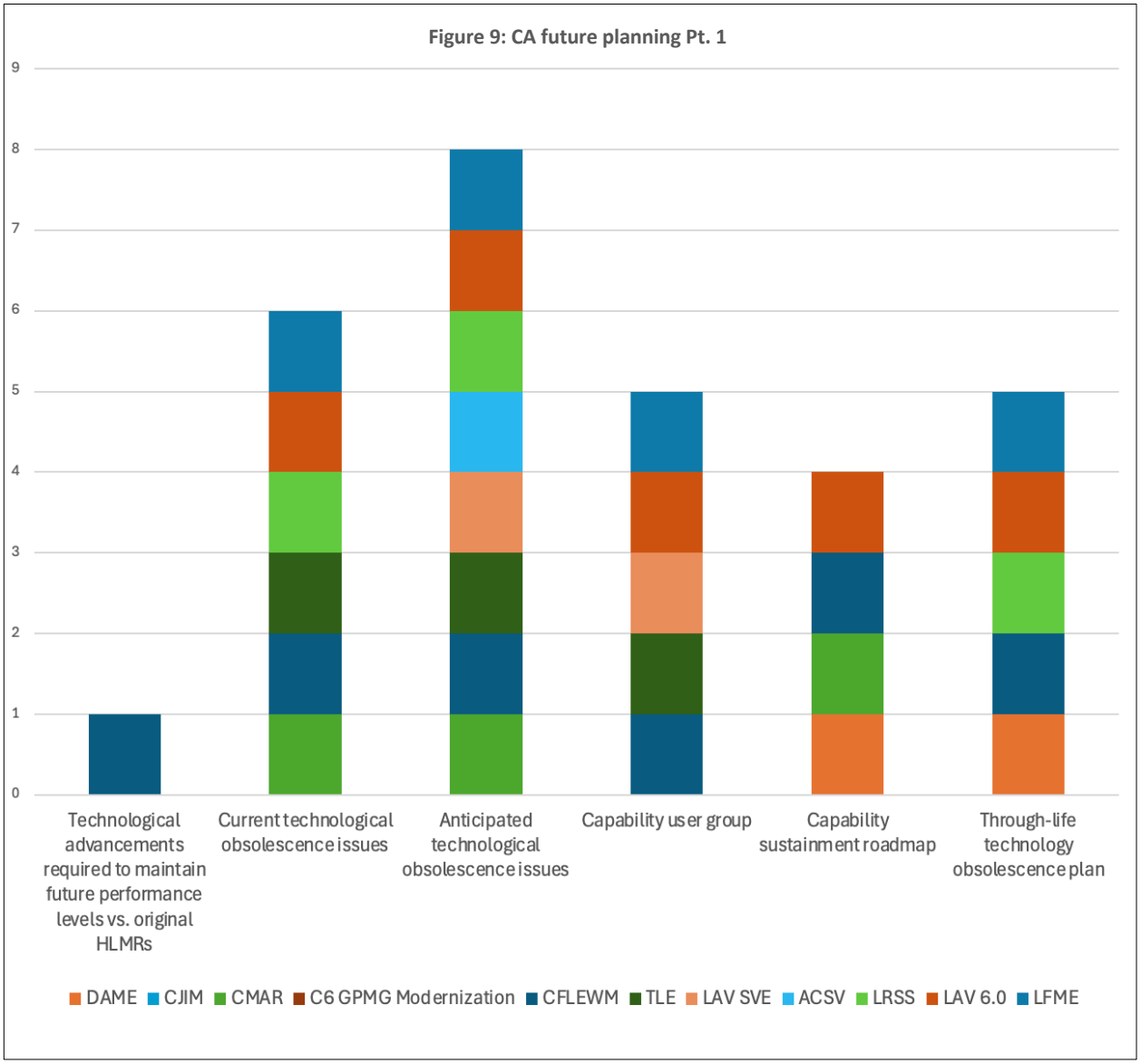


The former percentage reflects the frequency of CA participation in NATO operations and the periodic evolution of NATO Standardization Agreements (STANAGs) to enable reliable digital connectivity and equipment sharing between allied forces. The latter percentage likely reflects the CA's use of Five Eyes intelligence feeds and communications standards, which evolve to keep pace with threats and technology.

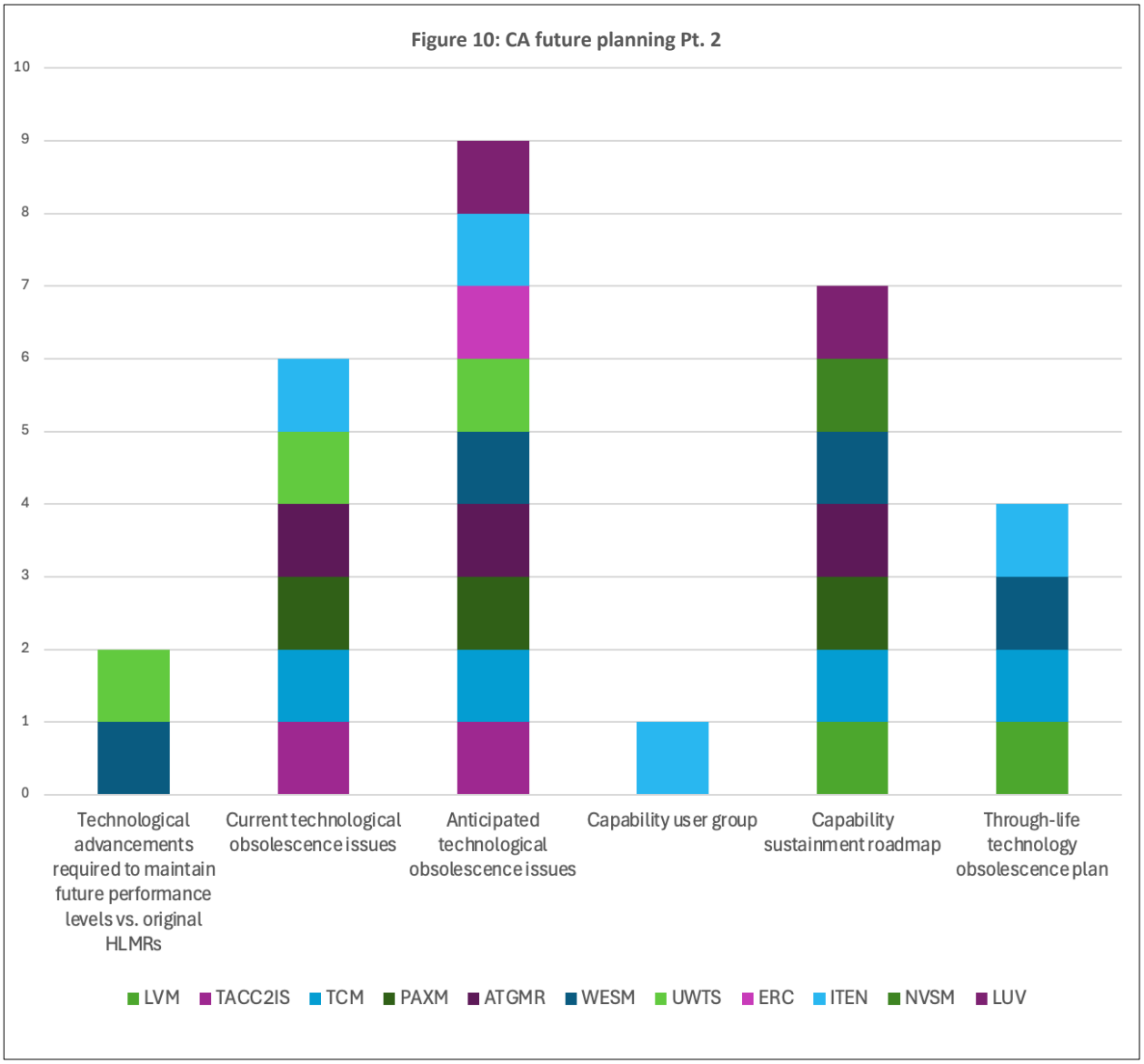


CA fleets intended for domestic operations only do not have costly interoperability requirements. Other projects, such as the Canadian Modular Assault Rifle (CMAR), are based on common standards which are not currently expected to change. CCS could help the CA to meet changing STANAGs and Five Eyes technical standards more efficiently and effectively.

Figures 9 and 10 capture the future planning category of CCS indicators. The prevalence of current technological obsolescence issues, which appear in 55 percent of surveyed projects, and anticipated technological obsolescence issues, present in 77 percent of surveyed projects, suggest once again that CCS may be well suited to future technology insertion activities. In keeping with the RCN and RCAF survey results, the obsolescence indicators capture the swift pace of contemporary technological evolution. The predicted timeframes for the future technological obsolescence issues identified in the figures above and below range from 0 to 15 years, with a mean value of 6.0 years. This is the lowest mean value among the three CAF services.



In addition to the "yes" answers captured above, CA survey responses indicate that some projects have no through-life technology obsolescence plan whatsoever and other projects will incorporate periodic refits rather than a holistic plan. One response maintains that such plans need not be part of major project deliverables and should be the sole remit of in-service support staff. Given the identified obsolescence issues and the costs of sustaining complex military systems, through-life technology obsolescence plans, which can be incorporated into CCS planning, will be critical to the effective and efficient sustainment of future CA capabilities.



Conclusions and recommendations:

1. Future technological obsolescence issues (77 percent), anticipated NATO interoperability requirements (64 percent), and current technological obsolescence issues (55 percent) were the most prominent CCS indicators among the CA projects captured in the dataset. Based on this observation, future CA CCS planning could be most effective and efficient if focused on these areas.

2. In this era of rapid technological innovation, capability sustainment roadmaps and through-life technology obsolescence plans are critical to future force readiness and operational relevance. Consideration should be given to incorporating CCS into these plans from inception so that in-service CAF capabilities can be rapidly refreshed (whenever feasible) rather than replaced under more protracted and costly capital projects.

3. CCS could be implemented across the CAF in conjunction with the establishment of dedicated capability management teams, which would bring force development and in-service support personnel together to develop and sustain complex and dynamic military capabilities more efficiently and strategically.

4. Supply chain access challenges are anticipated in 45 percent of surveyed CA projects. Such challenges risk seriously undermining future CA capability sustainment activities. CA capability sustainment roadmaps, through-life technology obsolescence plans, and future CCS planning should therefore proactively examine supply chain challenges and develop actionable steps to mitigate them, when and where needed.

5. In some cases, respondents indicated that specific projects were not sufficiently mature to assess the presence of a CCS indicator, but those respondents posited that additional indicators could become visible as projects evolve.

About the Author

William "Will" Richardson *is a PhD student 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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