



National  
Defence

Défense  
nationale



# Strategic Topic Research List 2015

CANADIAN  
FORCES  
COLLEGE



COLLEGE  
DES FORCES  
CANADIENNES

Canada 

## CONTENTS

<b>Foreword .....</b>	<b>ii</b>
<b>Strategic Issues by Organization:</b>	
<b>Assistant Deputy Minister (Policy).....</b>	<b>1</b>
<b>Canadian Army .....</b>	<b>4</b>
<b>Canadian Forces Intelligence Command.....</b>	<b>19</b>
<b>Chief of Force Development .....</b>	<b>20</b>
<b>Military Personnel Command.....</b>	<b>22</b>
<b>Royal Canadian Air Force.....</b>	<b>26</b>
<b>Royal Canadian Navy .....</b>	<b>32</b>
<b>Assistant Deputy Minister (Materiel).....</b>	<b>34</b>
<b>Canadian Forces Warfare Centre.....</b>	<b>37</b>

## FOREWORD

This is the Canadian Forces College's (CFC's) annual publication of the Strategic Topic Research List (STRL). The aim of this annual document is to raise students' and researchers' awareness of strategic topics that are of particular interest to the Department of National Defence and the Canadian Forces.

The list is a compilation of input from Federal Government subject matter experts across the field of security and defence studies. The research topics reflect current as well as longer-term strategic issues, and are revised as the research agenda evolves to meet the needs of the future security environment.

Students are strongly advised to read and study this document and contact any of the various DND/CF representatives listed herein for further information regarding possible research projects.

Sincerely,



Dr. Pierre Pahlavi

Chair, CFC Centre for National Security Studies  
Department of Defence Studies  
Canadian Forces College  
[pahlavi@cfc.dnd.ca](mailto:pahlavi@cfc.dnd.ca)

<b>Organization (name in full):</b>	<b>Assistant Deputy Minister (Policy)</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Ms. Elizabeth Punnett, Policy Officer, Directorate of Public Policy</b> <a href="mailto:elizabeth.punnett@forces.gc.ca">elizabeth.punnett@forces.gc.ca</a> <b>613-992-3675</b>
<b>General description of key areas of research:</b>	<p><b>How should disarmament and control regimes adapt to take non-state actors into account?</b></p> <p>There is increasing interest by non-state actors such as ISIS in developing Weapons of Mass Destruction (WMDs), including chemical weapons and conventional explosive weapons that contain radiological material. ISIS' recent battlefield gains have given it control over producers of chemical precursors and radiological sources. The international community must examine whether traditional methods of deterrence are still effective in this situation. Can non-state actors be deterred through existing disarmament and arms control regimes, or should these be adapted? If so, how? What new theories and tools are needed?</p>
<b>General description of key areas of research:</b>	<p><b>What are the implications of the increasing 'commercialization' of national security activities, including but not limited to space, cybernetics, and robotics?</b></p> <p>Defence departments and militaries have traditionally been the leaders in military innovation and operations. However, the commercial sector is playing an increasingly important role. This is creating both new challenges and new opportunities. For example, the fact that companies such as Google, Apple, Twitter and Facebook now play a vital role in cybersecurity raises issues surrounding effective coordination, regulation and oversight, yet also enables the US to leverage its commercial sector to enhance national security. Similarly, the commercialization of space technologies for launch and resupply, imagery, Space Situational Awareness, SATCOM, and, potentially, in-orbit servicing raises regulatory issues, but also offers the possibility of enhancing space resilience and increasing space capabilities. Meanwhile, the purchase of significant military robotics companies by Google could deprive the Pentagon of its key suppliers should Google decide not to seek future military contracts. In short, the commercialization of national security activities raises a host of issues which merit further academic and policy discussion.</p>

<p><b>General description of key areas of research:</b></p>	<p><b>What are the strategic, military, policy, legal, and ethical implications of new technologies as applied to Defence, including remotely-controlled and autonomous weapons, biometrics, and human performance enhancement?</b></p> <p>Rapidly developing military technology, combined with significant social, financial and demographic change and an altered security environment, is revolutionizing war. This is creating challenges in terms of understanding modern military conflicts, adapting our existing ethical and legal frameworks, and developing new strategies and operations that are both sound and moral. From increasing levels of autonomy in weapons systems, through the individualization of war resulting from advanced ISR and biometrics, to the potential creation of super-warriors using science, a range of related and interconnected strategic, military, policy, legal and ethical implications merits further exploration.</p>
<p><b>General description of key areas of research:</b></p>	<p><b>What are the plausible outcomes for Syria in 5-10 years, and the potential implications for regional stability?</b></p> <p>There are a number of competing forces fighting in Syria, and none has obtained a decisive advantage, leaving a stalemate. A number of factors could end the stalemate and tip the scales in favour of one of the main adversaries. These include the success of the international coalition in countering ISIS, a renewed offensive by the Assad regime, and the training and equipping of more moderate forces. Which of these drivers are most important? What are the plausible outcomes? What are the regional implications of these, including for Iraq, Turkey, Iran, and its relations with Saudi Arabia?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>How should North America’s defence and security institutions and mechanisms evolve to address emerging challenges?</b></p> <p>The Canada-United States defence relationship is Canada’s most strategically significant partnership, with the North American Aerospace Defence Command (NORAD) being its cornerstone. In the context of emerging threats to the continent, we must examine whether existing institutions and mechanisms are still well positioned to deliver the expected results, and consider what changes might be required to ensure that they remain efficient and effective. How can Canada and the United States remain prepared to continue jointly addressing challenges to North American defence and security? What future role should DND/CAF play with respect to continental and hemispheric security?</p>

<p><b>General description of key areas of research:</b></p>	<p><b>With Russia seemingly committed to protecting its remaining influence within the “post-Soviet space,” what does this mean for the Russia-NATO relationship?</b></p> <p>Russia’s continued influence in the remaining “post-Soviet space” has effectively slowed or prevented Euro-Atlantic aspirations for many of the countries within this sphere of influence. In particular, Russia’s recent actions in Ukraine have demonstrated its resolve to prevent these countries from further maturing their aspirations. What are the implications for NATO? In light of the severe costs Russia must endure, to what extent and for how long can it continue to exert influence within this space and on multiple fronts, including Ukraine, Moldova, Georgia and Belarus?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>What mix of capabilities is needed to deter the full spectrum of aggressive actions against NATO countries and their populations in today’s global security environment?</b></p> <p>Today’s global security environment is dominated by asymmetric adversaries (e.g., ISIS) and threats (e.g., Russia). Is a new approach required to continue meeting NATO’s deterrence objectives? If so, what would this look like? How can NATO best encourage Allies to adapt their own forces and capabilities in order to meet the Alliance’s deterrence objectives?</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Strat — Director Land Command Integration</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training</b> <a href="mailto:Roger.Cotton@forces.gc.ca">Roger.Cotton@forces.gc.ca</a> <b>271-4229 CSN</b>
<b>General description of key areas of research:</b>	<p><b>2014 — Decentralized Approach to Command and Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Capability Development</b></p> <p>The CD process has not been adapted to reflect the rapid evolution of technology and the unique integration issues associated with C4ISR capabilities. There have been some successes in the Canadian Armed Forces (CAF) and allied armies by introducing equipment through Urgent/Unforeseen Operational Requirements (UORs), Technology Demonstrator Programmes (TDPs), or as “buy and try” activities. In the Canadian Army (CA), many of the latter have been locally generated initiatives, which then led to wider adoption of a capability across CA. Without a formally established trials organization, it is felt that there may be some merit in allowing the CA to establish Divisions I manoeuvre Brigades, and the equivalents within other CAF environments, to conduct experiments with C4ISR capabilities on a distributed basis as a major part of the CD process. Similarly, the CA has developed a highly successful approach to iterative software development in generating a range of tools linked to the HRMS application. Again, these tend to be generated from local initiatives and then made available to a wider set of users.</p> <p>This approach reflects the Gartner BI-Modal concept of information technology and could be applied more widely. Consideration could be given to using Vote 1 funds to address the rapid technology refresh rate which our Vote 5 Capital Project process cannot match. The proposed research question is “Would a distributed experimentation approach add value to the Canadian Armed Forces (CAF) CD process for C4ISR capabilities?”</p> <p><b>2014 — Joint Requirements Organization</b></p> <p>Chief Force Development (CFD) has recently been given the authority to draw together CAF C4ISR CD activities with a view to ensuring that they meet the joint needs of the CAF, to reduce redundancy, and to better integrate activities. However, this approach requires CFD to knit together the respective requirement sets gathered by separate Environments. It also involves CFD’s running separate “joint” projects, even though there is no “joint”</p>

	<p>force generation organization. It may be more appropriate to gather all the Environments together into a single Capability I Requirements Management organization under a single chain of command (CoC). In areas such as C4ISR and Logistics, the subdirectorates would be highly joint and would naturally drive those engaged in the capability and requirements management arena to generate joint requirements from the outset and to consider the appropriate balance of investment against a single pot of money. It is likely that savings would be accrued through the rationalization of separate CoCs.</p> <p>The proposed research question is “What are the advantages and disadvantages of unifying the separate Environmental Requirements Management organizations into a single joint organization, and how could this be achieved?”</p>
<p><b>General description of key areas of research:</b></p>	<p><b>2014 — Fight as a Coalition, Survive Alone</b></p> <p>The CAF should understand the limitations of the Coalition (NATO or other) strategy, and the enduring misperception that one could rely on Allies for the provision of combat or enabling capabilities, given that in face of national interests or priorities, one may lose access to guaranteed support.</p>
<p><b>General description of key areas of research:</b></p>	<p><b>2014 —Support to the Arctic</b></p> <p>“As the Arctic becomes less and less frozen for longer and longer periods each year, what tasks and/or missions will the Army be expected to do in a temperate Arctic? What will be the concept of operations for those tasks? What internal and external interdependencies with other agencies will exist?”</p> <p><b>2014 — Definition of Core Competencies in a Context of Fighting among the People in the Information Age</b></p> <p>The Canadian Army is at the crossroads of defining what capabilities are critical for its ability to sustain combat operations through the lens of the Afghan experience. Are we setting ourselves for fighting the previous war again or are we investigating, and investing sufficiently in, the requirements to better understand the human dimension and fight among the people to be ready to fight the next war (e.g., are we overly relying on emerging technology for information operations)?.</p>



<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>LCol Y. Martineau, G1 Concepts Section Head Yvon.Martineau@forces.gc.ca 613-971-7280</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Conceiving and Designing the Will to Fight Construct</b></p> <p>The CA Study on Fighting Power is conceptualizing the Will to Fight as a core component of the Military Fighting Power which suggests that specific human characteristics contribute significantly to military effectiveness. However, the Will to Fight Construct is not currently well defined. Other factors also seem to contribute to the conceptual domain of the Will to Fight, such as the Will to Kill, Will to Overcome Fear and Adversity, Readiness to Die, Moral Power (Resolve), Resilience, Hardness and Hardiness, etc. This programme aims at clarifying all elements of the construct domain implied by the Will to Fight construct, to create a reliable and valid measure with core indicators of military performance. If this is not completed, continued deficiencies will be noted in appreciating individual as well as collective effectiveness in operations. This is aligned with the Army's mission and Objectives to deliver Combat-Effective Forces and "Army of Tomorrow" plans.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Maj Jean Bernard, Personnel Research Coord Jean.Bernard@forces.gc.ca 613-971-7291</b>
<b>General description of key areas of research:</b>	<p><b>2015 — SOCINT Analytical Toolbox</b></p> <p>The challenge for Sociocultural Intelligence (SOCINT) is to identify models and analytical frameworks that will support a better understanding and planning of potential effects (psychological and socio-cultural) in the Human Environment (HuE) and that will train the Sociocultural analysts to correctly use those models and frameworks. At present, there are no identified best practices and no training or professional development to support analysts. The aim is to develop, and train personnel in, a range of tools and analytical methods to achieve a comprehensive understanding of the HuE and to generate SOCINT. The identification of best practices and emerging frameworks, and the development and delivery of a SOCINT Analytical Toolbox, will enhance the CA's ability to understand, plan and manage effects in the HuE. If this is not completed, continued failure may be encountered in achieving operational effectiveness in the HuE.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Maj Jean Bernard, Personnel Research Coord Jean.Bernard@forces.gc.ca 613-971-7291</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Human Terrain Baseline, Effects Assessment and Measuring Change in Complex Social Systems</b></p> <p>There is a lack of theoretically-grounded and validated constructs that support the understanding of complex social systems, and in particular of those that generate, assess and maintain effects. The aim is to develop a theoretical construct for understanding social complexity, and the development/validation of techniques and methods for establishing a HuE (terrain) baseline and measuring the impact (effect) of operations. If this is not completed, continued deficiencies may be encountered in the CA's capability to understand and measure effects in complex social systems.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Maj Jean Bernard, Personnel Research Coord Jean.Bernard@forces.gc.ca 613-971-7291</b>
<b>General description of key areas of research:</b>	<p><b>2015 — SOCINT Intelligence Fusion</b></p> <p>There is a lack of standards for integration of HuE analysis into Joint Intelligence Preparation of the Operational Environment (JIPOE), Intelligence Cycle, SOCINT team composition, and interoperability across allies (ABCA and NATO), as well as a lack of Standard Operating Procedures (SOPs) for achieving a consolidated understanding of the HuE across the All-Source Intelligence Centre (ASIC), including management of the full range of technical and human Intelligence, Surveillance and Reconnaissance (ISR) assets. The aim is not only to examine ASIC structure and processes, and propose/validate a Sociocultural Analyst team model, as well as to validate linkages and information requirements to ensure intelligence fusion to achieve advanced, integrated Situational Awareness (SA) of the HuE, but also to develop SOPs and best practices to guide HuE data collection and integration of SOCINT into ASIC products for broad exploitation across HQ. If this is not completed, continued deficiencies may be encountered in appreciating and managing effects in the HuE.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Maj Jean Bernard, Personnel Research Coord Jean.Bernard@forces.gc.ca 613-971-7291</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Operational Ethics Preparation for the Future Security Environment (FSE)</b></p> <p>The FSE will be characterized by asymmetric conflicts, small wars, war amongst the people, cultural diversity, and adaptive dispersed operations, all of which pose increasing challenges with respect to the moral conduct of military operations. Just as importantly, seminal U.S. research has demonstrated that perpetrating, witnessing, or failing to prevent actions that violate fundamental moral beliefs is associated with higher combat exposure and poorer self-reported mental health outcomes for individual soldiers; lower ratings of ethical leadership; and greater gaps in pre-deployment ethical training. A research programme will inform the design of: training to best prepare personnel for the ethical challenges in the FSE; and of interventions to assist personnel in dealing with the consequences of making these difficult decisions in operations. The aim of this project is to assess the psychological and physiological effects of moral decision-making on military personnel; the effects of operational stressors (e.g., time pressure, information ambiguity and overload, sleep deprivation) on moral decision-making processes and the role of peers and leaders in operational decision-making.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Maj Craig Gardner, Army Ethics Officer Craig.Gardner@forces.gc.ca 613-971-7286</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Measuring attitudes towards <i>jus in bello</i> principles</b></p> <p>Bradley and Tymchuk (2014) suggested that planners involved in the OPP/Targeting decision-making process must have a good knowledge of <i>jus in bello</i> concepts (military necessity, discrimination, non-combatant immunity, proportionality, doctrine of double effect and no unnecessary suffering) in order to be effective when facing difficult moral choices. This suggests that full consideration of these principles effectively enable planners in the balancing of force protection, non-combat immunity, and mission success. This programme aims at assessing how knowledge and attitudes towards <i>jus in bello</i> principles contribute to effectiveness in operational</p>

	planning. This is aligned with the Army's mission and objectives to deliver Combat-Effective Forces and "Army of Tomorrow" plans.
--	---

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Maj Craig Gardner, Army Ethics Officer Craig.Gardner@forces.gc.ca 613-971-7286</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Effect of communicating the commander's ethical intent on planners' attitudes</b></p> <p>Bradley and Tymchuk (2014) suggested that communicating the commander's ethical intent has a powerful influence in the military. They also stated that in order to be effective, such a message must address four questions which help clarify ethical considerations/ factors to be considered in mission planning. This programme aims at conceptualizing an experiment to test the effect of communicating the commander's ethical intent on planning activities and to test the efficacy of the proposed format rather than less structured versions of a commander's intent. This is aligned with the Army's mission and objectives to deliver Combat-Effective Forces and "Army of Tomorrow" plans.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Maj Jean Bernard CA Personnel Research Coord Jean.Bernard@forces.gc.ca 613-971-7291</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Maintaining motivation post-Afghanistan</b></p> <p>Experienced soldiers may lose the motivation to stay in the CAF as a result of the reduction in operational tempo. The aim is to determine if motivation to stay in the military has been affected by a reduction in organizational tempo, to identify specific strategies COs can use to maintain high levels of motivation in their unit, and to identify specific strategies the CA as an organization can use to maintain high levels of motivation. If this is not completed, highly trained military personnel could leave the organization.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>LCol Yvon Martineau, G1 Concepts Section Head Yvon.Martineau@forces.gc.ca 613-971-7280</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Issue of sleep deprivation: Is the CA 72-hrs policy of continuous work effectiveness reasonable or even suitable?</b></p> <p>SOPs for Land Operations (B-GL-334-001/FP-001, TAM 503.04), states that soldiers are expected to remain effective for physical tasks for up to three days without sleep. However, it is unclear if soldiers can remain effective even for simple surveillance tasks over such an extended period of time. There is also no evidence that the 72-hrs policy is in any fashion realistic or reasonable and even suitable in particular contexts such as ADO, nation rebuilding/ reconstruction, or peacekeeping. Nor is there any evidence that it has ever been tested in training scenarios. There is a need to conduct literature reviews to clarify these issues and provide recommendations for further research. As an example, an integrative literature review of the state of the art regarding sleep deprivation research, with a focus on that work done in a military context, would be useful. That review will be necessary to determine what research gaps still remain and what gaps are of most interest to the Army to pursue.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Ops — G1</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>LCol Yvon Martineau, G1 Concepts Section Head Yvon.Martineau@forces.gc.ca 613-971-7280</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Decision-Making in the future operating environment</b></p> <p>Sensitivity of information and real-time scrutiny of soldiers' actions in the future OE will add pressure, as will the proliferation of sensors. The reduction, for both soldiers and leaders, of the cognitive overload associated with the proliferation of visualization and analysis tools to be operated, remains an important Army consideration. The CA approved the increase of the CF Aptitude Test cut-off for service in the Cbt Arms from 25<sup>th</sup> percentile to the 30<sup>th</sup> percentile and the Armour Occupation was further increased to the 45<sup>th</sup> percentile. Such a change should ensure that more capable individuals are joining the CA as officers. However, effective decision-making may not be a question only of aptitudes but also of cognition. Little effort was ever done to inform softer aspects of the decision-making psychology</p>

	<p>such as patterns or pathologies of decisions related to military operations (e.g., sub-optimal decision-making factors, errors in assessing risks, loss aversion in decision-making). Similarly, a review may be required to identify effective methods for sustaining decision-making in the new OE (e.g., Belief-Based Decision-Making, Intuitive Decision-Making, etc.). This programme aims at expanding our knowledge outside traditional focus on the decision-making process and procedure, and paving the road for a richer and more complete approach to training and development.</p>
--	--

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Strat — Canadian Army Land Warfare Centre</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<p><b>Lieutenant-Colonel D.J. Beyer</b>  <a href="mailto:dave.beyer@forces.gc.ca">dave.beyer@forces.gc.ca</a>  (613) 541-5010, extension 2479</p> <p><b>Lieutenant-Colonel R.W. Bell</b>  <a href="mailto:ronald.bell3@forces.gc.ca">ronald.bell3@forces.gc.ca</a>  (613) 541-5010, extension 5951</p>
<b>General description of key areas of research:</b>	<p><b>2015 — Evaluating the Effectiveness of Science and Technology Support to the Canadian Army</b></p> <p>The Level 1 ADM S&amp;T organization and the independent DND operating agency, DRDC, provide the Canadian Army with science and technology support across a broad range of activities. Pre-eminently, there is support to procurement through assisting in the ‘smart buying’ and comparison of market options, and trial and evaluation of combat systems, but there are smaller contributions in support of the development of the concepts, doctrine, theories, organizational structures and materiel solutions from which the Canadian Army will derive its fighting power into the future. With the adoption of the so-called ‘outcomes model’ of programme formulation, what is the logic model that describes the measures of performance that are required, not just for accountability to government and the public, but to ensure that the Canadian Army is increasing in effectiveness due to the contribution of the S&amp;T support provided? A paper is desired that would explore this process, evaluate the bureaucracy that oversees it, and provide a couple of case studies.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Strat — Canadian Army Land Warfare Centre</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<p><b>Maj. A.B. Godefroy, Concepts 2-3 and Executive Editor, <i>Canadian Army Journal</i></b>  <a href="mailto:andrew.godefroy@forces.gc.ca">andrew.godefroy@forces.gc.ca</a>  613-541-5010 ext.8726</p>

<b>General description of key areas of research:</b>	<p><b>2015 — The Canadian Army and Its Strategies</b></p> <p>Since the end of the Second World War, the Canadian Army has produced some sort of institutional strategy that articulates the ways and means it will employ to achieve various desired ends. Since 2001, the Canadian Army has taken to producing this strategy publicly and with some degree of regularity. How successful has the army been in applying its recent strategy and achieving its goals? What are some of the assumptions the army makes? What sort of constraints and restraints might the army have in developing strategy? Should the strategy be focused on meeting future goals or simply on navigating the present day? What sort of risk is involved? Finally, how does strategy development affect army future concepts and designs, as well as planning for interim transitions such as Waypoint 2018? Is there any other alternative to traditional strategy development that might benefit the army's future?</p>
--	--

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Strat — Canadian Army Land Warfare Centre</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Mr. Peter Gizewski, Strategic Analyst, DRDC CORA (at CALWC)</b> <a href="mailto:Peter.Gizewski@forces.gc.ca">Peter.Gizewski@forces.gc.ca</a> 613-541-5010
<b>General description of key areas of research:</b>	<p><b>2015 — A Poverty of Expectations? Foresight Analysis and the Future Security Environment</b></p> <p>DCI's recent publication entitled "The Future Security Environment to 2040" offers an officially sanctioned CAF view of the drivers and trends likely to influence defence and security over the coming decades, as well as the implications that this could have for the Canadian Armed Forces. Yet, while it is a useful reference document, is a single, official view of the FSE an adequate tool upon which future CAF capability development should proceed? What are the advantages and disadvantages of relying on a single FSE for capability development and future planning? What alternatives — if any — are available to supplement such work so as to understand the FSE and its potential implications for the CAF?</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Strat — Canadian Army Land Warfare Centre</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Mr. Peter Gizewski, Strategic Analyst, DRDC CORA (at CALWC)</b> <a href="mailto:Peter.Gizewski@forces.gc.ca">Peter.Gizewski@forces.gc.ca</a> 613-541-5010

<b>General description of key areas of research:</b>	<p><b>2015 — Strategies for Global Engagement: What are the Best Approaches?</b></p> <p>Turmoil in regions such as the Middle East, Europe, and Africa pose considerable challenges for Western military forces as they engage in operations aimed at helping to restore order and stability in those areas affected. In fact, the cost — in terms of blood and treasure — of such interventions has generated increased interest in strategies of deterrence, conflict prevention, and capacity building as viable means of addressing problems of regional conflict. Discuss the pros and cons of such strategies with reference to current operations and the conditions under which they are likely to succeed in future.</p>
--	---

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Strat — Canadian Army Land Warfare Centre</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>LCol Scott Wilson, Team Leader — Designs, CALWC</b> <a href="mailto:scott.wilson2@forces.gc.ca">scott.wilson2@forces.gc.ca</a> <b>613-541-5010 Ext 5936</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Joint Power?</b></p> <p>How the Canadian Armed Forces (CAF) and its allies combine land, air, maritime, and, more recently, space and cyberspace capabilities, defines how it will operate as well as the relative advantage the force will have over its adversaries.</p> <p>While “joint” combined arms manoeuvre is part of the Army culture, the institutional pushback to “J-Army” formations and headquarters has arguably held back the force development of the CAF from fighting and operating in the land environment (dependent on mechanisms and priorities external to the army to generate, for example, the tactical aviation, field hospital, operational sustainment, cyber-electromagnetic capabilities, and space-based communications needed). Is there a better way?</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — COS Army Strat — Canadian Army Land Warfare Centre</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>LCol Scott Wilson, Team Leader — Designs, CALWC</b> <a href="mailto:scott.wilson2@forces.gc.ca">scott.wilson2@forces.gc.ca</a> <b>613-541-5010 Ext 5936</b>



<p><b>General description of key areas of research:</b></p>	<p><b>2015 — Managed Readiness — maximizing force output or diminishing expectations?</b></p> <p>To maximize force output and respond to resource limitations, “Managed Readiness” assumes risk in weighting a significant portion of effective personnel, modernized equipment, and training towards a relatively small proportion (typically a third or less) of each capability or force package.</p> <p>In response, the institution adapts (optimizes/minimizes) its personnel, defence procurement and sustainment systems, infrastructure, funding models, and institutional training to this “optimized” readiness model. As a result, one can argue that the institution (CA, RCN, RCAF, etc.) no longer has the capacity or strategic flexibility to generate or surge, for example, a combat-effective Canadian Mechanized Brigade Group (CMBG), the ability to strategically lift more than a Battle Group, or tactically airlift a dismounted infantry company.</p> <p>What has been the effect of Managed Readiness on strategic planning, force development processes, and defence procurement?</p>
---	--

<p><b>Organization (name in full):</b></p>	<p><b>Canadian Army HQ — CA Doctrine and Training Centre — CACSC</b></p>
<p><b>Contact Person(s) (e-mail &amp; phone #):</b></p>	<p><b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b></p>
<p><b>General description of key areas of research:</b></p>	<p><b>2015 — Officer Professional Development System</b></p> <p>How should the Canadian Army refine the officer professional development system IOT enhance officers’ critical thinking skills and achieve cognitive dominance — intellectual, physical and emotional strength — to attain advantage in any given situation or against any given adversary? What is the best way to educate our officer corps in a joint/strategic perspective much earlier in their careers?</p>

<p><b>Organization (name in full):</b></p>	<p><b>Canadian Army HQ — CA Doctrine and Training Centre — CACSC</b></p>
<p><b>Contact Person(s) (e-mail &amp; phone #):</b></p>	<p><b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b></p>
<p><b>General description of key areas of research:</b></p>	<p><b>2015 — Potential gaps in the CAF Joint Operational-level doctrine</b></p> <p>Is the CAF joint operational-level doctrine sufficient to allow for the successful planning and conduct of full-spectrum operations at both the operational and tactical levels? What are the gaps?</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — CACSC</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>
<b>General description of key areas of research:</b>	<b>2015 — Leaner Formations</b>  To meet the demands of the future strategic environment (FSE) in alignment with the Canadian Army's strategic vision and priorities, what steps should the Army take to make formations leaner while retaining capability and becoming more expeditionary to meet the challenge for fundamental change by 2030-35?

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — CACSC</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>
<b>General description of key areas of research:</b>	<b>2015 — Interdependencies between CANSOFCOM and the CA</b>  How should CANSOF and the Canadian Army become more interdependent? What are the ways and means by which CANSOF and the Canadian Army can efficiently increase their capabilities through interdependent actions? Are there missions and tasks currently being undertaken by CANSOF that could be aligned with those of the Army?

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — CACSC</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>
<b>General description of key areas of research:</b>	<b>2015 — Primary Reserve role</b>  How should the Canadian Army change the way it thinks about the roles of the Primary Reserve and how to utilize them? What operational tasks should be assigned to the Primary Reserve?

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — CACSC</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>
<b>General description of key areas of research:</b>	<p><b>2015 — New Generations of serving members</b></p> <p>What are the character and motivation of the new generation of soldiers, sailors, airmen and airwomen joining the CAF? Are there differences in the moral obligations of Army professionals and the commitment of the new generation of military personnel? Are there new professional developmental challenges for the CAF and the Services?</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — ADC</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>
<b>General description of key areas of research:</b>	<p><b>2015 — The Utility of Future Concept Development</b></p> <p>The US Army develops a new concept every two years on which to base doctrine and other aspects of capability development. In a similar manner, the CAF and the Canadian Army put immense resources into future concept development and in turn base capability development upon its various conclusions and outputs. One such example was the 2004 Canadian Army “Purpose Defined: the Force Employment Concept for the Army”. Based on this publication, concepts such as “manoeuvre to strike” and the medium direct fire system (a system-of-systems to replace the main battle tank) were developed as a response to what was viewed as the new operating paradigm. Yet experimentation and the practical lessons of Afghanistan proved such concepts to be hollow, to the point of tactical and operational failure. In more recent times, the Army has developed the concept of Adaptive Dispersed Operations, which, despite lacking a formal definition or a tangible tactical scheme of manoeuvre, has been repeatedly cited as the basis for future capability development. A proposed paper would examine the true utility of post-Cold War concept development, as measured against post-conflict analysis (e.g., lessons learned from Afghanistan and other theatres), current threats (e.g., the situation in the Ukraine), experimentation, and the enduring nature of conflict. Research material can be obtained from various open sources, peer-reviewed articles critical of future concept development, Army Lessons Learned Centre, Canadian Army Land Warfare Centre, and Directorate Army Doctrine.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — ADC</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>
<b>General description of key areas of research:</b>	<p><b>2015 — Concepts — Irrelevant Capability or Lost Art</b></p> <p>The CAF is at the crossroads of defining which capabilities are critical for sustainment in the post-Afghanistan environment and in future concepts such as Adaptive Dispersed Operations (ADO). Is the CAF well positioned to handle conventional detainee scenarios with a predictable increase in numbers? Furthermore, in the context of the future security environment, how would the CAF address complex detainee scenarios involving new categories of “combatants?” Is the envisioned non-linear non-contiguous security environment even conducive to the handling of detainees or is a new policy required?</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — ADC</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>
<b>General description of key areas of research:</b>	<p><b>2015 — An examination of Canada’s “Tooth-to-Tail” Ratio</b></p> <p>Conduct an historical analysis of the CF’s “Tooth-to-Tail” ratio (T3R) and compare it to the current state of affairs. The author can choose to define T3R in a variety of ways; e.g., Tooth can be restricted to Combat and Combat Support elements, or can also include those Combat Service Support elements required to conduct operations. Tail would include those institutional elements not contained within the Tooth definition. The study will identify any trends, their causes, and associated impacts. The study could then make recommendations to improve the T3R.</p>

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — CAEG</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training Roger.Cotton@forces.gc.ca 271-4229 CSN</b>

<b>General description of key areas of research:</b>	<p><b>2015 — Intelligence Support Concepts and Structures in support of ADO in a JIMP Environment</b></p> <p>Considering Canada’s experience with the ASIC in Afghanistan, previous Cold War experience with the ICAC*, and the concentration of intelligence collection capabilities in CFINTCOM/CF Int Gp, what are the best intelligence support concepts and structures for the Canadian Army and the CAF in order to effectively support land-focused adaptive dispersed operations in a JIMP environment across the full spectrum of conflict?</p>
--	--

<b>Organization (name in full):</b>	<b>Canadian Army HQ — CA Doctrine and Training Centre — CAEG</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Colonel R.T. Cotton, Chief of Staff Army Training</b> <b>Roger.Cotton@forces.gc.ca</b> <b>271-4229 CSN</b>
<b>General description of key areas of research:</b>	<p><b>2015 — A comparison of the CA CASB model’s capabilities with those of other equivalent allied formations</b></p> <p>The CA will deploy a medium-weight force supported by key enablers within an adaptive dispersed doctrinal context. Many ABCA and NATO Armies have invested significant resources into high-value low-density enabler capabilities. How have allied armies achieved effective C3 of their enabler capabilities? What organizational structure has been developed and does this have both a force employment and force generation operational role? The CA is considering establishing a Combat Support Brigade (CASB) to provide C3 for enabler capabilities. Compare and contrast the capabilities of the CA CASB model; other ABCA/NATO nations; and other equivalent allied formations.</p>

<b>Organization (name in full):</b>	<b>Canadian Forces Intelligence Command (CFINTCOM)</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	Mr. Nick Scheurkogel and Major E. Lacasse
<b>General description of key areas of research:</b>	<p><b>Security Intelligence Assessment (SIA) has a submission for the CFC STRL.</b></p> <p>“As a means through which communications occur, the cybernetic environment can be and is being manipulated to shape attitude, knowledge, perception, and sentiment of targeted groups. This work is being perfected by advertising groups, but has also been observed being actively employed in support of geopolitical and military objectives.</p> <p>As the CAF’s only current focus of cybernetic operations capability planning is the defence of its networks, this entire set of activities has not been rigorously examined to determine what types of capabilities the CAF needs to defend itself and its interests against the delivery of adversary influence through cybernetic activity. The Study should answer the questions:</p> <ol style="list-style-type: none"> <li>1. What are the types of information/cognitive effects that can be delivered through cybernetic means?</li> <li>2. How can these cybernetic influence activities be detected? (Should include cybernetic and non-cybernetic means.)</li> <li>3. How can cybernetic influence activities or their corresponding effects be effectively countered? (Should include cybernetic and non-cybernetic means.)”</li> </ol>

<b>Organization (name in full):</b>	<b>Chief of Force Development Director of Strategic Coordination</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	Capt (N) Jeff Hamilton (DESIG DSC APS 15) 613-992-7511 <a href="mailto:Jeffrey.Hamilton@forces.gc.ca">Jeffrey.Hamilton@forces.gc.ca</a>
<b>General description of key areas of research:</b>	<b>Responsible Use of Scientific Knowledge</b>  To ensure that key technological and scientific breakthroughs are not used by other states or non-state actors for malicious purposes, there exists significant potential in examining this very topical issue. As an example, Arms control and counter-proliferation would be a very interesting place to establish criteria for the responsible use of scientific knowledge.
<b>General description of key areas of research:</b>	<b>Future Security Environment (FSE)</b>  The FSE is a DND/CAF product, with a whole-of-government view of what the future fight may look like, through Horizon 2, 3 and beyond. An examination of how the CAF could improve on the extant FSE development process, from a methodological perspective, would be viewed as extremely valuable.
<b>General description of key areas of research:</b>	<b>Enhanced Governance of DND/CF Joint Capability and FD</b>  Distributed sponsorship of joint capabilities is proving to be a challenge. A need exists to identify a champion, responsible across all Horizons, for joint capability development within the CAF. An examination of past and current processes, with an eye for proposing a future process which encapsulates Joint Capability FD, would be viewed as very useful.
<b>General description of key areas of research:</b>	<b>Whole-of-Government (WoG) approach to educating Senior Officials on the Arctic</b>  JCSP and Nssp course planning is the only vehicle by which any level of education is provided to senior leaders within DND/CAF with respect to the Arctic. Examination with recommendations for increasing the awareness by senior officials of Arctic issues, given the importance this Government has placed on the Arctic, would be of added value.
<b>General description of key areas of research:</b>	<b>Whole-of-Government (WoG) Cybernetic Policy</b>  In view of the lack of a congruent, WoG policy with respect to cybernetics, there exists an information gap. A study identifying the cybernetic domain considerations with respect to requirements,

	<p>global engagement, industry relations, and procurement framework could prove to be very useful. Leveraging CSIS and CSEC in company with DG Cyber to possibly develop a WoG policy while also leveraging USCyberComd, could prove very useful. The intent of this topic would be that it remain at the UNCLAS level; however, if they are needed, CFD would welcome classified annexes (via CSNI or courier).</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Space-Based Enablers</b></p> <p>As future space-based technologies expand and become a reality, an examination of how these future space-based enablers could support/enable Maritime Domain Awareness would prove useful.</p>



<b>Organization (name in full):</b>	<b>Military Personnel Command</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	DGHS/LCol Plourde, 613-945-6396.
<b>General description of key areas of research:</b>	<p><b>Aversion to Combat Casualties in Contemporary Western Civilization</b></p> <p>Description: Commanders, politicians and the public in western societies have demonstrated increased aversion to high casualty rates during military operations. NATO and coalition involvement in the Afghan conflict saw the expenditure of immense effort at providing rapid evacuation and treatment of wounded coalition personnel, achieving an unprecedented 97% survival rate. Is it reasonable to assume that this aversion will persist or even increase in future operations? In the face of emerging war-fighting technologies, is it possible to achieve higher survival rates, or for that matter, even sustain the rates achieved in Afghanistan? What balance of assets (medical personnel, clinical capabilities, air/ground evacuation platforms, point-of-injury training, etc.) is required to ensure high casualty survival rates?</p>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	CFRG HQ COS Pol & Doc/LCol Stouffer, 705-424-1200 ext 3086
<b>General description of key areas of research:</b>	<p><b>Social media: Both actively mitigating CAF threats launched through social media and actively engaging social media to achieve opportunity.</b></p> <p>Social Media are a powerful tool. However, they have the potential to both benefit and harm the CAF. The CAF need to be prepared for this reality. To this end, what do the CAF need to do now to be prepared for the future? Furthermore, what safety elements are paramount when using social media to achieve opportunity and to deter threats? More specifically, in this evolving and competitive environment, how can the CAF use the social media to their advantage in terms of recruiting or training?</p>
<b>General description of key areas of research:</b>	<p><b>Emerging social media trends and the security/vulnerability of CAF personnel</b></p> <p>With the widespread use of social media it has become difficult to ensure the true identity and intentions of users. Besides the broadcast information provided within the CAF, what are the mechanisms in place to protect the CAF and its members from the misuse of social media directed at them personally or at the CAF? Have other armed forces developed policies in this regard?</p>

<p><b>General description of key areas of research:</b></p>	<p><b>Economic Globalization and security implications</b></p> <p>Economic globalization offers new opportunities and is interdependent with economic warfare. Considering the increased globalization, what are the resulting impacts, both positive and negative, on security? What are the risks to military professionalism?</p>
<p><b>Contact Person(s) (e-mail &amp; phone #):</b></p>	<p>LCol Lisa Noonan, DGMC, 613-617-0852</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Multi-Source Assessment for Executive Officer Assessment and/or Development</b></p> <p>Multi-source assessment in the context of personnel appraisal concerns the use of multiple sources (e.g., self, subordinates, peers, superiors, course instructors, and/or clients) to evaluate individuals' current performance and/or their potential to be effective in positions of greater responsibility. The application of multi-source assessment for executive leader selection (Col and above) might be beneficial. A response to this question should consider: (a) the various forms of multi-source assessment applied in industry and other militaries, and cited in the performance appraisal literature; (b) how best to apply multi-source assessment (who, what, when, where, how?); (c) issues pertaining to scientific validity, legal defensibility, fairness, and any other risks and benefits associated with multi-source assessment within the larger CAF personnel appraisal system; (d) the practicality of incorporating multi-source assessment with the most senior leaders in light of resources, structure, and culture/sub-cultures; and (e) alternatives — if multi-source assessment is not deemed sufficiently practical or beneficial for assessment, could the CAF enhance its current application of multi-source feedback for professional development purposes?</p>
<p><b>Contact Person(s) (e-mail &amp; phone #):</b></p>	<p>DGMPRA, Dr. Tzvetanka Dobрева-Martinova, 613-996-3305</p>
<p><b>General description of key areas of research:</b></p>	<p><b>The implications of increased military presence in isolated northern communities.</b></p> <p>Canada's North is an essential part of Canada's history and national identity. The presence of the Canadian Armed Forces in the North has been increasing, whether it be in exercising Arctic sovereignty by conducting operations and exercises, or in maintaining a permanent presence in a variety of locations, including Joint Task Force (North) headquarters in Yellowknife, Northwest Territories. This increased presence brings with it a need to better understand how individuals, families, culture, environment, livelihood, and health in the North might be affected by an increased military presence. Furthermore, what are the potential impacts of increasing military presence on CAF relationships with northern governments and communities, and a range of national</p>

	<p>and international government and non-government stakeholders? It is also important to better understand the impact of an increasing CAF mandate in Canada's northern and isolated regions on the readiness and sustainability of Canadian military operations. Such demands on military resources and capabilities include the potential effect of northern cultural operations on the health, capabilities and resiliency of our personnel, including questions regarding pre-deployment culture and resiliency training, as well as requirements for accessible personnel support services for deployed CAF personnel.</p>
<p><b>Contact Person(s) (e-mail &amp; phone #):</b></p>	<p>DGMPRA, Mr. Wayne Ross, 613-996-6415</p>
<p><b>General description of key areas of research:</b></p>	<p><b>The effects of social media use on the military applicant and recruit population.</b></p> <p>Social media play a pervasive role throughout society and its organizations, including the military. In various ways, social media represent a valuable tool for the military as they can be leveraged to share important messages broadly throughout the organization and Canadian society. Social media facilitate communication of military employment opportunities among Canadian youth, contribute to the creation and sustainment of positive military branding and social identity, and provide a valuable link between military members and their families when they are required to be away from home for extended periods of time. However, it is also true that social media can exacerbate organizational vulnerabilities. The release and wide promulgation of information can have unintended and far-reaching impacts. Missions can be compromised, erroneous information can promulgate out of control, and the communication of unconscious biases or lack of appropriate awareness on a range of military subjects can quickly create perceptions of military incompetence among the Canadian public. Furthermore, the power of social media as a tool for every soldier, sailor and aviator, regardless of rank and position of authority in the military, represents a potential force multiplier as well as a challenge to modes of social control that the military has traditionally relied upon. Given the continuous development of communication technologies and their significant impact on the effectiveness of a range of military functions, critical review and analysis are required to contribute to frameworks and strategies for both leveraging and mitigating the impacts of social media on military effectiveness.</p>
<p><b>Contact Person(s) (e-mail &amp; phone #):</b></p>	<p>DGMPRA, Dr. Kelly Farley, 613-996-1280</p>
<p><b>General description of key areas of research:</b></p>	<p><b>The impact of Enhanced Mutual Reliance models on capability development in the Canadian Armed Forces</b></p> <p>Militaries around the world are facing shrinking budgets and resources. The Enhanced Mutual Reliance (EMR) model proposes sharing the</p>

	<p>burden of developing and providing high-value capabilities among allied nations. This goes beyond traditional sharing of knowledge and resources, to propose a model by which one nation would depend on another for a particular capability in support of future operations. For example, one nation might be selected to be exclusively responsible for the provision of medical services in a future coalition environment, and another for the provision of all anti-mine capabilities. EMR models are being considered in the research and development domain. To what extent can this approach be transferred to the operational domain? What are the benefits and obstacles? Are there existing examples and best practices of mutual reliance across military and other organizations which can inform further development of EMR strategies? Are there particular capabilities this would be more suited for? What are the factors that will affect the feasibility of EMR, including, for example, potential impact on domestic security and interoperability with Canadian security partners? Should EMR be limited to traditional military organizations or is there potential for including a broader range of security stakeholders?</p>
--	---

<b>Organization (name in full):</b>	<b>Royal Canadian Air Force</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Lieutenant-Colonel Jason Porteous, Director Air Staff Coordination</b> <a href="mailto:jason.porteous@forces.gc.ca">jason.porteous@forces.gc.ca</a> <b>613-945-1206</b>
<b>General description of key areas of research:</b>	<p><b>Should the RCAF change its practices regarding HR Management?</b></p> <p>With constrained budgets and a continually changing Canadian family dynamic, the “old way of doing things,” whereby personnel were expected to move every 3-4 years, is no longer viable. With society having transformed to double-income, career-orientated families, personnel often have less desire to move unless it suits all of the family members’ needs, a fact that becomes more so further into one’s career. Personnel are switching from the regular force to the reserves, albeit late in their careers, to gain the stability they desire in their family life (noting that recent annuitant policy changes have reduced Reserve viability for some). Is it possible for the RCAF to adopt a practice whereby personnel who are not succession-planned can be offered reserve status, allowing those personnel the stability they seek (personnel would remain liable for deployments)?</p>
<b>General description of key areas of research:</b>	<p><b>What strategic or operational-level Lessons Learned can be gleaned from recent expeditionary air operations, such as Op MOBILE, Op REASSURANCE and Op IMPACT?</b></p> <p>The RCAF Lessons Learned implementation directive, signed off by LGen Deschamps on 28 Dec 2011, identified the requirement to aggressively operationalize the RCAF Lessons Learned Program (LLP) through a collaborative effort of all levels on command and technical authorities. This collaboration of effort is predicated on the LLP as a command-driven initiative for which the primary centre of gravity is personnel engagement and commitment to success by RCAF commanders. The RCAF has been actively engaged in the last four years through various deployed operations in the international arena. Ultimately, the RCAF LLP supports continuous improvement, from the correction of deficiencies to the adoption of best practices, in order to improve effectiveness and efficiency. Looking at recent operations, what has really been learned that could make the RCAF a better organization?</p>
<b>General description of key areas of research:</b>	<p><b>How will the RCAF prepare today, for the undefined battlespace of the future?</b></p> <p>The future security environment, as referenced in <i>Air Force Vectors</i>, is challenging to predict and warfare remains complex. The</p>

	<p>increasing distances between combatants, for example, is a result of advances in technology. Specifically the electromagnetic spectrum, which includes cyberspace, has enabled combatants to sense, find, target, and act against their enemy at ever-increasing distances. Additionally, the fast-paced changes to technology are facilitating asymmetric warfare whereby technologically weaker opponents are able to influence, control, and deny the battlefield from superior, well-equipped combatants. Many nations are focusing their research on the electromagnetic spectrum to employ their version of anti-access/anti-denial (A2/AD) theory of warfare with the intent to deny their enemy access to strategic avenues of approach. Depending on the weapon system, combatants could cause first and second orders of effects from distances not conceived by the great military thinkers of old. The battlespace is becoming increasingly complex and defining its borders is virtually impossible.</p>
<p><b>General description of key areas of research:</b></p>	<p><b>What are the air power implications resulting from Russia’s increasingly aggressive posture and annexation of Sovereign European territory?</b></p> <p>This raises many questions: “Will the annexation continue”? If it does, what if the Russian Federation decides to expand its territory in the Arctic? Will this result in significantly more RCAF patrols in the North? How will Russia’s nuclear capabilities affect the response from Canada, the US and NATO? Will the RCAF return to a permanent presence in Europe? If so, what type of missions will they likely be tasked with?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>What are the future RCAF C4ISR infrastructure requirements? More specifically, what are the requirements to support fifth generation air power? What organizational changes are required within the RCAF to support such an enterprise?</b></p> <p>Currently, the C4ISR infrastructure is essentially an ad hoc collection of components that provide only a limited integration among the sensor, information processing centres, and the decision-makers. Not surprisingly, it is only partially effective. Fifth-generation platforms will have significant ISR and weapons capabilities, but they can achieve maximum effect only if they are fully networked. Can we even know the future infrastructure requirements? Would it be more cost-efficient to begin implementing a simple infrastructure that can grow and improve easily? How can DND change the procurement process to facilitate this evolution?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Investigate the viability of treating every air platform as a sensor.</b></p> <p>Perhaps more importantly, how can the RCAF ensure that every platform, airborne or otherwise, is a network <b>node</b>? It’s not enough to simply put a sensor on every platform; the RCAF needs to be able to leverage this capability and that means full networking from sensor to</p>

	<p>commander to shooter. Clearly this means that communication links are essential, and if the RCAF is going to invest in this infrastructure, it would be more valuable if the connectivity provided true network capabilities, i.e., data that could be shared across all DND systems and platforms.</p>
<p><b>General description of key areas of research:</b></p>	<p><b>To what extent should the RCAF invest in C4ISR infrastructure?</b></p> <p>Clearly the C4ISR infrastructure needs to be improved. But the RCAF does not currently know the desired end state, given that DND cannot even accurately define their lines of operation beyond five years. Would it be feasible to identify components and prioritize them for upgrade? Is it even possible to take a piecemeal approach without wasting large amounts of capital and without constraining operations?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Can the RCAF integrate real-world C<sup>2</sup> Air and Space power operations and simulated C<sup>2</sup> Air and Space power training? Can the CAF institute an effective joint training system?</b></p> <p>The current DND (in particular RCAF) simulation training system is focussed on individual training (e.g., pilot). Live, virtual and constructive (LVC) simulation offers DND the opportunity to train personnel on Joint/Coalition C<sup>2</sup> systems that will be encountered on both domestic and international operations. Alongside cost benefits LVC allows Peer-on-Peer and Asymmetric combat scenarios to be generated — resulting in more realistic, fitted-for-purpose and just-in-time training. However, the CAF does not have a recognized and integrated training system. The Canadian Forces Warfare Centre and CJOC are the designated training agencies but have had little to no success.</p> <p>Possible additions:</p> <ul style="list-style-type: none"> <li>- The CFDS is unaffordable in terms of both resources and human capacity; pending a visionary reset, how do we manage our air power enterprise in the near term? Divestments? Efficiencies? Innovation? All of the above?</li> <li>- Focusing on internal integration and standing apart from the other components allows for the RCAF to be a more efficient force by streamlining processes, equipment, and training. This internal integration allows for more standardized expectations in terms of operational outputs of the RCAF as a whole. Op IMPACT provides an example of the RCAF's deployment of a force that is primarily focused on air power effects. But does the CAF need the RCAF to have a more internal focus? While the ATF construct brings various RCAF communities together to be a more efficient force, is it at the expense of closer integration with the other components? Does the CAF need the RCAF to be more focused on increased integration with the other components?</li> </ul>

- People — the RCAF Leader of Tomorrow — recruits today ‘2015’: how do we build those individuals within our institution to be the Institutional Leaders of tomorrow? These best and brightest have to be cognizant but independent of the political climate of the day. Foundational training and education (or the evolution of training and education) today (21<sup>st</sup> Century) lead to CAF PME that is Canadian in nature and built on best practices and needs of today with a Canadian solution for tomorrow. The attributes of the/a leader of today and tomorrow are not entirely different from those of the/a leader of the past — but the Profession of Arms continues to evolve and deserves a deliberate effort on this front.
- Care, maintenance and management of Simulators/Simulation in the RCAF. The maintenance and upgrading of Simulators and the maintenance of the RCAF Simulation capability needs deliberate effort in order to meet the needs of a future RCAF that will have simulation technology “more and more” embedded in its everyday efforts. From Flight Sims, through training and evaluation, to operational planning, simulation will only continue to increase in importance within an evolutionary RCAF. Is there a need for an RCAF Simulation Officer by 2030/2040? Is this an evolution of the AERE — CELE (Air) MOSID (or ACSO)?
- RCAF (CAF) in Space. The future will see humanity continue to look to the heavens as exploiters and explorers. Does the government (beyond CSA), and therefore the RCAF, have a place in this realm?.
- Can/should the RCAF adopt a model wherein Reg Force members can remain geostatic by choice? This level of HR determination might be controllable/achievable by individual environment (RCAF). The use of Reserve Force employment to enable geostatic decisions by reg force members is (to an extent) already in place, albeit not by a completely seamless process (and frankly, the common notion is that one actually has to “change teams” vs remaining part of the original “team” in a part-time or even full-time capacity). We may be able to integrate/harmonize our RCAF Succession Management to incorporate a harmonized full/part-time workforce...but not yet (we’re not even there yet on the Res Force side vis-à-vis full/part-time reservists)
- The above actually leads to the larger strategic CAF question of HR and the management of a fully integrated full-time AND part-time CAF organization (i.e., NOT Reg and Res...and not necessarily eliminating the need for a “strategic” reserve component that is integrated into the Canadian societal fabric). This notion would require changes to the National Defence Act ( NDA), which maintains that reservists must “consent” to service, and therefore, as the Act is currently written, there can be no ongoing “liability for



	<p>deployments” for those Reg Force pers transferring to the P Res who are simply seeking geostability). A fully integrated CAF that allows seamless transfer of pers from full-time to part-time service would be the next logical (and needed) iteration of “Total Force”. This level of integration would be complicated by liability issues, Terms of service, establishment/MOSID control, etc.</p>
<p><b>General description of key areas of research:</b></p>	<p><b>The optimal Wing Headquarters Structure and common operational staff processes?</b></p> <p>The RCAF war-fighting model requires the tactical delivery of Canadian air power through an ATF- or AEW-deployable FE model. This model is generally based on the Wing Headquarters as the basis for C2 design, and the Wing Commander can be appointed as the expeditionary commander. To the extent practicable, FE demands that there be reasonable commonality of C2 design and process to facilitate training and operational transition. What should the optimal design and operational staff process model look like for a Wing/AEW Headquarters in the RCAF context?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Is ‘centralized control and decentralized execution’ really still relevant under the Canadian tactical air power model?</b></p> <p>This air power C2 concept has been mainstream air power theory for decades, but is it fundamental to the Canadian FE model? It seems also to be a little simplistic in this day and age. Explore the veracity of this C2 concept reviewing Canadian air power history and consider alternatives. Remember that centralized control and decentralized execution are fundamentally a variation of mission command. Are they? What differentiates this model in terms of air campaigning? Is it specifically tied to the shaping phase? And given the centralized digital control of the battlespace these days, is there really any ‘decentralized execution’?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Have we really assessed the impact of a high-threat offensive cybernetic and electronic capability on the delivery of Canadian tactical air power?</b></p> <p>What would be the operational impact, on the C2 and coordination of Canadian air power, of facing a near peer threat with robust cybernetic and electronic attack capabilities? What could be the impact on ‘centralized control and decentralized execution’? Understandably the leaning to high technology to facilitate flexibility, C2 and the overall effectiveness of air campaigning/war-fighting output is very attractive. What is the risk for Canadian air power of an overreliance on this technology when facing a near peer or peer threat? Analyze the risks and consider conceptual needs allowing the RCAF to still be capable of delivering tactical air power against such a threat.</p>

<p><b>General description of key areas of research:</b></p>	<p><b>Is there benefit in assuming a niche air power role for the RCAF?</b></p> <p>Middle power Air Forces are difficult to sustain in terms of maintaining advanced technology and a balance of qualitative/quantitative air power output. Should the RCAF look to maintain only niche capabilities to better provide a return on investment for Canada? If you had to design the RCAF as a niche air power institution due to budget constraints, what air power capabilities are considered core and how should the institution be structured?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Should the RCAF introduce a formal risk management system?</b></p> <p>Risk management is now well embedded in many western air power institutions and commercial aviation organizations. It is based on a sound assessment of the calculus of likelihood and consequence to provide a reasonably objective understanding of risk which should then be accepted at the appropriate level of command. The fundamental aim is one of force preservation ensuring that high-risk missions are well understood based on the probability of impact on air power capability. When the cost of technology and human capital is so high, wouldn't it make sense to do our utmost to mitigate risk? Should the RCAF consider instituting a formal risk management system? What is the institutional risk/return benefit?</p>

<b>Organization (name in full):</b>	<b>Royal Canadian Navy</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Commander Tim Kerr, Director Naval Strategy</b> <a href="mailto:timothy.kerr@forces.gc.ca">timothy.kerr@forces.gc.ca</a> <b>613-945-0547</b>
<b>General description of key areas of research:</b>	<b>Support to Naval Operations in the 21<sup>st</sup> Century</b>  <p>The CAF has used In-Service Support (ISS) contracts to deliver training, engineering, maintenance and logistics support across the spectrum of military operations. An evaluation of how ISS affects the Royal Canadian Navy's (RCN's) core capabilities and its ability to generate forces/sustain in-house support and repair capacity will help the RCN determine the preferred way ahead for trade structures, training requirements (how much and how delivered), size of force, etc. What are the limitations and benefits of using ISS to sustain Naval capabilities? What is the effect on deployability and interoperability? What are the lessons learned from previous and existing ISS contracts, both CAF and Allied? What are the long-term implications of using ISS to deliver support?</p>
<b>General description of key areas of research:</b>	<b>Procurement of Naval capability beyond NSPS.</b>  <p>The National Shipbuilding Strategy clearly identifies its mandate as facilitating the delivery of naval platforms up to the Canadian Surface Combatant (CSC). What form of procurement of naval assets will take place beyond CSC for future replacements of surface ships and submarines? Looking at the stated aim of NSPS, will these objectives still be valid? Will a different model will be required? If so, what form could this procurement model take? Is a joint procurement process possible under the current cultural paradigm of the CAF? How can progression to a more responsive life cycle of technologically relevant capability be achieved within government regulation limitations?</p>
<b>General description of key areas of research:</b>	<b>Technology and Innovation</b>  <p>Today, the world is defined by the speed and ease with which information and technology are shared and accessed. Technology can be employed by adversaries as quickly as it can be introduced, as many such adversaries are not burdened by the bureaucratic process and policy constraints that exist within the force development organizations of western militaries such as Canada's. Accommodating technological change is particularly challenging in the current era for smaller militaries with limited resources, especially when combined with the extended length of time involved in the design and building schedules of modern naval platforms, and the current lengthy FD process involved in getting new technologies into current operational assets. These factors imply that navies such as the RCN have a disadvantage when it comes to ensuring technological superiority or</p>

	<p>even parity with those of adversaries. Is this in fact true? If so, how can the CAF and RCN reshape their practices to ensure that we maintain a consistently combat-effective navy in this era of rapid technological change within a dynamic security environment?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>The Impact of New Technologies on Underwater War-fighting</b></p> <p>New technologies in signature management technology, submarine air-defence (SUBSAM), ultra-long-range torpedoes, multi-mode torpedo homing systems (wake, passive-active, wire), have been fielded in the underwater domain. The robotic age has generated a host of new platform options, including transoceanic gliders and long-range UUVs. Moreover, scientific and underwater resource exploration has opened the underwater domain to low-cost exploration, exploitation, and information-sharing technologies. What are the implications of these changes for future Canadian capabilities and force structures in the conduct of warfare in the underwater domain? Do these new underwater domain challenges represent a paradigm shift in the threat that will affect our historic splendid isolation?</p>
<p><b>General description of key areas of research:</b></p>	<p><b>Use of Unmanned and Autonomous Systems in the Kill Chain</b></p> <p>A number of factors are increasing the complexity of decision-making in future conflict. The increasing use of technology enables war-fighters to deliver effects without human intervention. The Law of Armed Conflict, Rules of Engagement, and Canadian societal values all come to bear on any decision to deliver lethal capability. Coalition operations introduce political considerations, fire-control sequencing, and networking complexities that must be incorporated into the Commander's decision-making cycle. Employment of unmanned system may require a change in the trade structure, the field of responsibilities of the Environmental chief, and the methodology to train operators and employ the capability inherent in acquired systems. What are the legal, moral, and ethical considerations and changes necessary for autonomous targeting and kinetic strikes against humans?</p>

<b>Organization (name in full):</b>	<b>Assistant Deputy Minister (Materiel)</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Jennifer Cassar, Executive Assistant, Chief of Staff (Materiel)</b> <a href="mailto:jennifer.cassar@forces.gc.ca">jennifer.cassar@forces.gc.ca</a> 613-992-9239
<b>General description of key areas of research:</b>	<p><b>What impact on Russia might result from the introduction of Canada's new capability to conduct Arctic Operations?</b></p> <p>Background: The Canadian Navy will be developing a new capability enhanced through the acquisition of a new fleet of Arctic/Offshore Patrol Ships. Russia is showing indications of reinstating actions of the Cold War era. As Russia is in such close proximity to Canada and borders our Arctic waters, will the introduction of this new capability cause Russia to further enhance its own? Would this new capability pose a significant threat to Russia? How might the threat environment and landscape change in the Arctic? How should Canada be preparing to react?</p>
<b>General description of key areas of research:</b>	<p><b>Whole of Government Intellectual Property Policy</b></p> <p>Background: Intellectual Property (IP) is a strategic asset that can help the federal government better serve the interests of Canadians. There is currently no whole-of-government IP policy or framework for the management of IP assets owned by or licensed to the government. The Australian government has such a policy/framework. Should Canada have one? And if so, what system should be used to manage this strategic asset?</p>
<b>General description of key areas of research:</b>	<p><b>Relationship Balance between Industry and Government of Canada in Defence Acquisitions</b></p> <p>Question: How does one balance the relationship that exists for defence acquisition between the Government of Canada (including Public Works and Government Services, Industry Canada and Department of National Defence) and the Canadian defence industry, given the new policies and initiatives introduced by the Defence Procurement Strategy?</p> <p>Background: There are a number of defence procurement objectives that must be balanced within the Defence Procurement Strategy model. The Government wishes to provide closer engagement with the Canadian defence industry through Value Propositions, joint research and development, and support to exports. Meanwhile, Government acquisition stakeholders continue to look for open competition, value for taxpayer money, and cybernetic barriers which protect the Department's sensitive information and infrastructure. Is there an appropriate balance that allows for closer relationships with Canadian industry?</p>

<p><b>General description of key areas of research:</b></p>	<p><b>Cyber-Security and Enterprise Systems</b></p> <p>Question: “Which system is more robust and affordable in today’s cyber-security environment: the emerging single enterprise system, or the legacy stove-piped system it replaces?”</p> <p>Background: Over the past few years as mandated by Treasury Board, DND has been rolling out its single enterprise system based on Materiel Acquisition and Support Information System (MASIS)/DRMIS. It was selected to replace a number of legacy support systems in order to reduce support costs, increase integrated functionality, and overall, achieve departmental and operational efficiencies through collating diverse information into a single repository. However, over the time that it has taken to roll MASIS/DRMIS out and begin to integrate and exploit this system, emerging cyber-threats have resulted in rapidly evolving and more stringent cyber-security policies. This has had an adverse impact on the intended functionality of the MASIS/DRMIS system within the DWAN in the form of additional restrictions, workarounds, and development of safeguards. All of this new activity requires a dedicated level of effort and additional funds.</p> <p>This raises a number of ancillary questions:</p> <ol style="list-style-type: none"> <li>1. Are the cost savings and efficiency gains anticipated by replacing these older systems adversely being offset by the emerging costs and level of effort required to safeguard and bolster the single integrated MASIS/DRMIS system against cyber-attack or being compromised?</li> <li>2. Are we losing the anticipated efficiencies and functionality of MASIS/DRMIS?</li> <li>3. Could the older legacy framework and stove-piped structure that MASIS/DRMIS is replacing be inherently safer in today’s environment, given that it was compartmentalized and required human intervention in connecting the various systems, and as such was effectively “firewalled”?</li> </ol>
<p><b>General description of key areas of research:</b></p>	<p><b>An Enterprise Cross Domain Solution for Military Training in a Synthetic Environment</b></p> <p>Background: The RCAF Simulation Strategy (RSS) describes objectives for future live, virtual, and constructive military training in a synthetic environment out to 2025. The strategy seeks to increase student training throughput and effectiveness at a reduced cost. Inherent in this strategy is the ability to simultaneously connect both unclassified and classified simulators and training devices over a DND network, the CFXNet, while conducting collective and/or joint training exercises, also known as Distributed Mission Training (DMT). The currently used Radiant Mercury device at the Canadian Forces</p>

	<p>Air Warfare Centre (CAWC), owned by NORAD, has significant technical and operational limitations. A DND-developed and -owned enterprise cross-domain solution to manage multi-level security DMT issues would be an enabler for effective implementation of the RSS.</p>
--	---

<b>Organization (name in full):</b>	<b>Canadian Joint Operations Centre — Canadian Forces Warfare Centre</b>
<b>Contact Person(s) (e-mail &amp; phone #):</b>	<b>Dr. Gitanjali Adlakha-Hutcheon, Canadian Forces Warfare Centre</b> <a href="mailto:Gitanjali.Adlakha-Hutcheon@forces.gc.ca">Gitanjali.Adlakha-Hutcheon@forces.gc.ca</a> <b>613-998-7749</b>
<b>General description of key areas of research:</b>	<p><b>Targeting Influence Activities</b></p> <p>Development of expertise in the use of weapons is essential for a nation’s armed forces. While this is a subject of study and has policies, and standard operating and coordination procedures in place, this is not the case for targeting within the domain of non-munitions-based effects specifically for Influence Activities (IA). Not only are how and when to target not well understood, but questions such as who presses “the trigger” and how best to assess collateral damage remain largely unanswered.</p> <p>Other questions that arise include: What are the ways and means to conduct effective operations to achieve non-munitions-based targeting? Where lie the gaps? How can these be addressed? Are there parallels between the deployment of conventional and unconventional weapons with respect to targeting? Is there a need for centrally coordinating the delegation of authorities? An additional level of complexity is added to the above questions in the face of technical advances in social media and its easy access to and by a large populace. This is further compounded given that influence activities are a joint capability that does not naturally fit under the umbrella of any of the Environmental Commanders. How will CAF support the development, manning and exploitation of such a joint capability? Are there better approaches?</p> <p>A paper reviewing the above challenges would be topical and strategic.</p>



<p><b>General description of key areas of research:</b></p>	<p><b>Capabilities and countermeasures in the use of swarms as weapons</b></p> <p>Most defence organizations study means to optimize targeting particularly in the traditional sense, which has mostly focused on the immediate threats, which are often fairly large, identifiable targets.</p> <p>Technology is enabling the emergence of a new category of threats which are small, autonomous and likely coordinated, as in a swarm. The challenge of securing against autonomous and small threats is magnified severalfold in a densely populated urban environment. With globalization, urbanization, technical advancements and easy access to technology it is important to examine ways to effectively secure against these types of threats.</p> <p>This research topic proposes identifying: (1) the means to war-game, experiment, model, and exercise the use of swarms as weapons; (2) consider implications for the organizational structure, command and control, and delegation of authorities to deploy autonomous swarms; and (3) examine the above to defend against autonomous swarms for achieving effects beyond surveillance.</p> <p>Given that the Canadian Forces Warfare Centre (CFWC) is developing a Joint Targeting Centre of Expertise, an independent examination of this topic will improve Canadian Armed Forces (CAF) technical responsiveness.</p>
---	---