

CANADA'S DEFENCE POLICY

Now Taking Off



June 2017





Time to Go

The following commentary was developed by the authors between December 2016 and May 2017. It has been updated to reflect some aspects of the Government of Canada's Defence Policy as announced on June 7th, 2017. The initial contribution of Joel Wagman, Captain (ret'd) is appreciated.

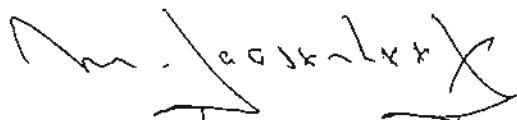
Right Honourable Justin Trudeau, Prime Minister of Canada
The Honourable Chrystia Freeland, Minister of Foreign Affairs
The Honourable Harjit Singh Sajjan, Minister of National Defence

Dear Prime Minister and Ministers,

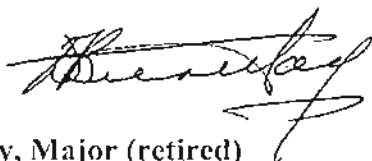
The Government of Canada is to be congratulated for undertaking a new comprehensive Defence Policy Review. In doing so it consulted with Canadians and invited comments and submissions. The following commentary is presented in response to that invitation in the anticipation that it may help with the realization of Defence Policy. It is not a policy paper in and of itself; nor is it to be considered a comprehensive review of defence policy. It is, however, replete with questions and observations on both international and domestic issues as to how the new defence policy may be implemented and made operational. The analysis and proposals we offer are designed to elaborate some of the threats, risks and issues facing Canada and its military. They are intended to prompt even further discussion than the proposals in the new Defence Policy on how the Canadian Armed Forces can be recruited, organized, trained and tasked to meet further challenges. The ideas offered are painted in broad strokes; almost every comment in this material can be subject to debate but it is backed by substantive commentary elsewhere. The only indisputable comment made is that a country's military forces must be able to win at whatever they do. If they cannot, then they are not meaningful or viable.

As stated elsewhere, a modern and competent military of well-trained and well-equipped personnel is a deterrent to aggression and a bulwark of peace. Your recently announced Defence Policy implicitly recognizes that. Consequently, it provides the Government of Canada with an enhanced range of options when dealing with international or domestic events, as well as providing its citizens with greater peace of mind and reasonable pride in its members. The comments contained in this paper have been developed with the input, guidance, criticism and advice of numerous military personnel and civilians from several countries. Many of these contributors wish to remain anonymous for their own reasons. As a private initiative, the authors recognize that we could not have produced this report without them. Our appreciation for their contributions is magnified only by its value. While this report has benefited from their suggestions, the responsibility for its views expressed herein are solely those of the authors and do not necessarily reflect the policy or position of any organization. We thank the Mackenzie Institute for helping make these comments available to the public.

Yours very truly,



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Canada's Defence Policy: Now Taking Off

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Canada's Defence Policy: Now Taking Off

Intelligence is essential for military planning; artificial intelligence will soon become critical for military planning and operations.

PREAMBLE

The forecast of future threats remains as difficult today as at any time in history. For government to formulate appropriate defence policies with some durability is at best an imprecise art, even for the most insightful and informed. The rapid and huge expansion of sciences, computer systems, robotics, and multi-dimensional communication technology combined with expanding populations, climate change and religious/ideological and cultural wars involving hundreds of millions of people with their resultant migrations, makes forecasting and designing appropriate enduring defence policies very difficult. However, it is incumbent upon stakeholders to assist in such matters.

Since there is so much future multi-dimensional uncertainty, a basic philosophy must be to avoid preparing for past ways and wars. Rather Canada needs a Canadian Armed Forces (CAF) of expert, adaptable and well equipped generalists in the full renaissance meaning of the term, innovating and meeting the new challenges of the future while retaining the lessons of experience. Great equipment can be built or bought; great personnel need to be recruited and developed.

It is the intent of the following commentary to assist government in its defence and security policy efforts, by asking critical questions and, in some cases, proposing conceptual answers.

There is no 'morality' in nature; only the strong win out.

An effective military must be built, trained, equipped and supplied to WIN. Losing is not an option; it is deadly.

INTRODUCTION

A nation's Defence Policy is most effective when the international and domestic context in which a nation sees itself is well appreciated by its leaders, both in and out of office. In a shrinking world some communities of which are resisting technology pushed globalization, Canada remains a nation state with sustained responsibilities for the security and defence of its relatively small multi-cultural population spread across a large and resource rich land mass. That land mass ranges from a frigid, vast Arctic north to the more temperate south bordered by one contiguous country and different oceans on its east, west and Arctic coasts. To its north, Canada has two major and one minor competitor for its Arctic sovereignty and resources. A fourth and perhaps fifth competitor may be emerging.

While considerable distances separate Canada's coasts from those of others, abundant resources in and under the nearby waters prompt multi-national use ranging from simple transportation to marine and sub-surface exploitation. Canada's third dimension – its skies and atmosphere – too, are critical to its prosperity and security.

Canadians historically view themselves as a reasoned, fair, tolerant, honest and peace-loving members of the international community. However, when these values are threatened, either directly or to those

other nations it considers friends and allies, Canada has proven to be a formidable military partner/participant often punching beyond its weight. Nonetheless, Canada takes equal, perhaps even greater pride in making peace, rather than forcing it.

*Perhaps one should know who one is,
before they decides where one wants to go.*

The fundamental questions a country's defence policy needs to ask are:

1. What is worth protecting?
2. What are the appropriate roles of a country's armed forces?
3. How are the personnel selected, trained, deployed and supported?
4. How are the forces equipped to maximize their effectiveness?

PART I: BACKGROUND

THE CANADIAN MILITARY DEFINED

Most recently, the Government of Canada, in a brief but revealing commentary entitled "WHO WE ARE AND WHAT WE DO" (last modified as to content July 18, 2016) demonstrates recent subtle modifications to the intent and purpose of the Canadian Armed Forces:

"Canadian Armed Forces (CAF) members are proud to serve Canada by defending its values and sovereignty, at home and abroad. They support freedom, democracy, the rule of law and human rights around the world."



Members of 31 Canadian Brigade Group conduct a patrol during Exercise ARROWHEAD CALM at Meaford, Ontario on April 22, 2017. Courtesy of Combat Camera,

http://www.combatcamera.forces.gc.ca/gallery/cc_photos/detail/?filename=LX01-2017-0019-039&assetId=58238

The Mandate of the CAF has been:

1. Protecting Canada and defending our sovereignty;
2. Defending North America in co-operation with the United States, Canada's oldest ally;
3. Contributing to international peace, most often in partnership with allies from other countries.

Canada's defence policy has been committed to a Canada First Defence ("CFD") policy which initially was introduced in 2006. Premised upon the CFD, the Canadian military establishment has been refocused and equipped to achieve five core missions – applicable to deployment, within Canada, North America and world-wide. Specifically, the CAF has been tasked with having the capability to:

1. Conduct daily domestic and continental operations;
2. Respond to a major terrorist attack;
3. Support civilian authorities during a crisis in Canada (including natural disasters);
4. Lead and/or conduct a major international operation for an extended period of time;
5. Deploy forces in response to crises anywhere in the world for shorter periods.

In the newly-announced Defence Policy, the CAF has been given eight specific missions:

1. Detect, deter, and defend against threats to Canada;
2. Lead/contribute forces to NATO/coalition efforts;
3. Response to international and domestic disasters/major emergencies;
4. Engage in capacity building;
5. Detect, deter, and defend against threats to North America;
6. Lead/contribute forces to international peace operations;
7. Assistance to civil authorities/law enforcement;
8. Conduct search and rescue.

CANADA'S MILITARY HISTORY AND EXPERIENCE



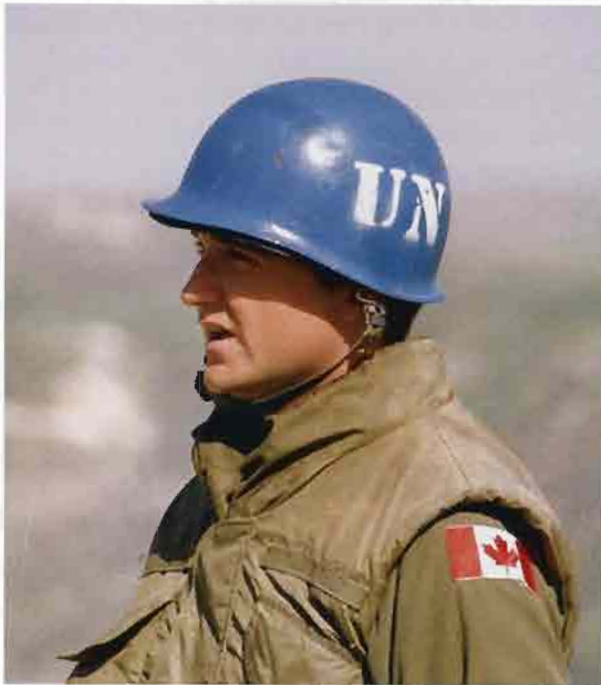
Canadian soldiers during a training exercise before the raid on Dieppe. Courtesy of Flickr, <https://www.flickr.com/photos/lac-bac/4678559137>

both domestic and in foreign stations, becomes clear in the following brief list of the wide variety of venues, in which the CAF has been engaged since 1945: The Cold War (NATO service); the Korean War; the Gulf War; the Oka Crises (Quebec); the Afghanistan War; the (first and second) Iraq Wars; the 2011 Libyan Civil War and Syria most recently. Additionally, there have been many CAF missions as peacekeepers (sometimes 'peacemakers') on behalf of the United Nations: Suez, Cyprus, Haiti, the Bosnian War, the Kosovo War, pirate interdiction of the coast of East Africa, the Somali Civil War and Rwanda come to mind. One could suggest that the aid to the civil authorities during the October Crisis (Quebec) was a form of peacekeeping as well. We, as Canadians, can truly be proud of the work overall of our armed forces.

Since 1945, the CAF have overcome numerous ups and downs encompassing their identity, equipment, purpose and nature of mission(s). Canadian military members, particularly Canada's army, have served in combat, peace-making and peacekeeping operations on almost every continent in numbers varying from divisional and brigade strength to company and platoon levels. (See footnote 3, page 31) Similar experience is shared by the smaller Royal Canadian Navy (RCN) and Royal Canadian Air Force (RCAF). Whatever their role and purpose, the men and women of the CAF have served worldwide with honour, courage and dignity with few exceptions; often, with inadequate numbers and resources. The diverse nature of the CAF's role, in



Canadians during the Korean War. Courtesy of National Defence Canada, <http://www.journal.forces.gc.ca/vq4/no4/lecture-conferen-eng.asp>



Canadian Blue Helmet (UN Peacekeeping).
 Courtesy of NAOC,
<http://natoassociation.ca/wp-content/uploads/2015/05/Canadian-Peacekeeper.jpg>

During the Cold War era, a principal focus of Canadian defence policy was to counter the Soviet threat by contributing (via its NATO responsibilities) to the security of Europe. To that effect, Canadian air, ground and support forces were based in Europe (primarily West Germany) from the early 1950's until the early 1990's. Consequent upon the end of the Cold War during 1988-89, NATO moved its defence focus 'out of immediate national areas.'

In NATO or UN support roles, Canada's land forces then became heavily engaged in European and African troubled areas, such as Kosovo, Serbia and Bosnia and Somalia and Rwanda in roles which often morphed from peacekeeping to peace-making. From 2002 to 2015 Canadian land forces performed successful combat mini-campaigns against Taliban-Jihadi insurgents in Kandahar province and other Afghanistan locales. Today JTF2 personnel provide front line training to Kurdish military fighting against ISIS.

Whatever the mission, task or operation, whether under the Maple Leaf of Canada or the Blue Beret of the United Nations, each deployment of the CAF has been operationally different from previous missions. Each had its own special character; Afghanistan was very different from Somalia from Kosovo from Rwanda.

One characteristic was similar. The response time regarding deployment, although workable, could have been better, if immediate response unit(s) consisting of even better trained and appropriately equipped personnel had been pre-selected, prepared, and available for rapid deployment.

One retired officer, with whom the authors spoke, noted that: providing maps of Somalia copied from a year-old Atlas is inexcusable in the age of GPS based mapping. Deploying a regiment because 'it was its turn' is not an appropriate approach any more than choosing commanders in order 'to get their ticket punched.'

Canadian JTF2 member. Courtesy of the CBC,
https://i.cbc.ca/1.1896066.1380858950!/httpImage/image.jpg_gen/derivatives/16x9_620/hi-jtf2-852.jpg



Canadian JTF2 member. Courtesy of the CBC,
https://i.cbc.ca/1.1896066.1380858950!/httpImage/image.jpg_gen/derivatives/16x9_620/hi-jtf2-852.jpg



Belgian-made Iltis jeep. Courtesy of Wiki Commons,
https://upload.wikimedia.org/wikipedia/commons/3/3c/Belgian_Volkswagen_Iltis.jpg

For personnel, providing pre-deployment cultural sensitization and effective use of diverse Canadian peoples' linguistic capabilities should be normal operating procedure, not unique. Effective equipment is essential too. Overpriced, underpowered Iltis 'jeeps' may have been marginally useful in Kosovo, but dangerously under armoured in Afghanistan.

For a small country, Canada has a real history of active military engagement, often coming as we were.

Considering these defence principles and the foregoing definition of the CAF identity as outlined above, in order to develop a more focused defence policy, it is useful to examine the international and domestic geopolitical environment of today and

that of the relatively near future. To do this, a threat analysis seems appropriate.

PART II: THREATS TO CONSIDER

THREAT/RISK ANALYSIS APPROACH

Serious effort has been made to identify future international as well as domestic threats that Canada and its current allies will face. Since there are so many, the authors of this report have used a somewhat subjective approach to include or exclude a possible threat. If in our considered opinion, there was a greater than 10% probability/seriousness that it could happen in the next 20 years, it was included. Those of us who have been in the forecasting business for many decades know that the unexpected or 'it'll never happen' events are always the greatest danger. Those, as well as silent unstated, false or unexamined assumptions are most often the reasons for failed forecasts.

TRANSNATIONAL THREATS/EVENTS

Transnational threats, meaning threats external to Canada's present borders, but which have potential impact on Canada and/or its multicultural peoples can be classified in four sub-categories.

First, there are those which impact directly on or adjacent to Canada's borders. They include:

- Challenges to Canada's sovereignty, principally in the Arctic, most likely by the United States and Russia, possibly by China and South Korea. Such challenges could include diversion of waters from the Great Lakes or flow reversal of rivers in B.C., for example.
- Significant unrest in the United States which crosses over the border, e.g. large scale civil strife/secession of member states.
- Significant environmental degradation of adjacent lands and air quality or waters e.g. chemical contamination, oil spills, nuclear accidents, over fishing of adjacent ocean areas and like situations.
- Missile and/or asymmetrical attacks on US sites, particularly near Canada's borders.

Second, those which involve conflicts among and/or within multiple nations. These include:

- Large regional conflicts which have major economic, communal or environmental impact on Canada e.g. war in the Middle East; European territorial expansion wars; Indo-Pakistan nuclear war; European Union disintegration; Korean regional conflict; China/US, China/Taiwan and/or Chinese/Japanese conflict.
- A new World War exploding out of at least four critical areas currently brewing (the Middle East; Europe (Baltics and Ukraine); the Korean Peninsula; and the South China Sea).

Third, those which involve localized tribal, clan and/or ideological conflicts e.g. Mali, Libya, Kenya, Somalia, Colombia and Central American states, in which Canada may choose to engage under a UN mandate or coalition of friends, or as a result of pressures from kinfolk now resident in Canada; such was the case in the Lebanon evacuation emergency.

Fourth, cyber-attacks emanating from international (or domestic) sources. Such attacks could affect critical parts of Canada's power grid and/or international financial and transportation systems causing significant societal disruption of potentially lengthy duration. Such attacks also 'blur the line' between the military and civilian spheres. By implication, the systems must be kept separate, or more practically equally secure, then raising questions of compatible security and privacy.

Fifth, Acts of God including large scale geological and/or climate related events.

Response to or engagement with such threats, of course, requires well trained and equipped personnel. But over-reaching superb basic training and equipment is the recognition of different capabilities required, as suggested below.

DOMESTIC THREATS/EVENTS

Unlike the United States, the Canadian military has a standing "aid to the civilian authority" role enshrined in Parliamentary Acts. There is no "posse comitatus"¹ act as there is in the USA which inhibits the active military from engaging with the domestic public as there is the USA. Thus, Canada's military (which includes the Army, Air Force, Navy *and* Coast Guard) may be called upon to provide aid ranging from disaster relief to putting down a perceived insurrection. More specifically, Canadian military personnel and units could become involved in:

- Working with and backing-up police forces to maintain law and order e.g. War Measures, terrorists' events, widespread international gang violence or Akwesasne/Dease Lake type events.
- Protecting major public infrastructure e.g. government buildings, pipelines, refineries, banks, power plants, etc.

¹ Note: An ancient Common Law to all males over the age of fifteen on whom a sheriff could call for assistance in preventing any type of civil disorder. The Posse Comitatus Act is a United States federal law signed on June 18, 1878 by President Rutherford B. Hayes. The purpose of the act – in concert with the Insurrection Act of 1807 – is to limit the powers of the federal government in using federal military personnel to enforce domestic policies within the United States.

- Assisting in flood relief, fighting forest fires, preventing water diversion, earthquake and hurricane relief and other Acts of God
- Responding to off-shore emergencies within territorial waters including ship wrecks, irradiated waters, lost aircraft, illegal fishing and more.
- Possible strife among/within multi-cultural communities in Canada e.g. Tamil/Sinhalese; Hindu/Sikh; First Nations struggles; religious extremists.

In regard to domestic terrorism, it is stressed, that this is largely the mandate of domestic security agencies and good police work. There are examples in Canadian history of groups revolting against established government authority - rightly or wrongly - such as the so-called Riel Rebellion, the Winnipeg Riot or the more recent G20 demonstrations. Other, more recent examples in which firearms and/or explosives were used include the Calgary bar shooting (2016), the plan to derail a train over the Niagara Gorge (2013), the Toronto 18 plans (2006), and the 2014 attack on Parliament Hill were all resolved without the use of military personnel. While legally the military could have been deployed, the RCMP was used to bring an end to the unrest. The one notable exception to this pattern is, of course, the controversial deployment of the Canadian Army during the October Crisis (1970).

Domestic terrorism seems best fought by good, integrated security and police work and appropriate social measures.

OTHER SIGNIFICANT THREATS/RISKS

CME (Coronal Mass Ejection):

There is a statistically increasing threat from a CME from the sun according to international scientists. The continent-wide 1859 Carrington event and the May 1921 railway shutdown in Eastern North America caused significant disruption of the then nascent electrical system. An event today similar to that of 1859 would place North America and potentially a major part of the world in a total blackout with consequent economic and societal disruption of an almost unimaginable scale. Quebec experienced a mini CME in 1989.

EMP (Electronic Magnetic Pulse):

A regional EMP release, likely caused by a terror attack from a small mobile device, would cause severe local disruption potentially lasting several days, weeks or months in the area affected depending on the power of the device. A well-positioned, high altitude nuclear explosion which might be a potential 'opening shot' in a major war, could have a devastating effect on the economy and society of North America. ALL UNPROTECTED ELECTRONICS WOULD POTENTIALLY FAIL. According to the US Congressional Task Force Report of 2004 experts project that 90% of the population of North America would die within 12 months due to the absence of medical treatment, failure of the transportation system and food supply, breakdown of municipal water and sewage systems with resultant widespread disease, famine and social unrest.

Major Climate Change:

While proceeding more slowly than either of the preceding two events, major climate change is occurring. Some argue that the weather is warming; others that a new 'ice age' is approaching. Regardless of the argument, the data and personal experiences show that weather patterns are changing with resultant impacts on water supply and agriculture. There will be follow-on impacts to such diverse elements of the biosphere as forestation and fish habitat, as well as other yet unknown effects.

Major Earthquake and/or Volcanic Eruptions:

The Cascadian Fault in southern British Columbia is overdue to shift in the view of major earthquake experts (US FEMA, Region 10 office), whether on its own or as a result of major tectonic shifts to the south or elsewhere in the Pacific "Ring of Fire". The impact of a 7+ earthquake could be devastating.

Whether as a ripple effect of a major quake in the U.S. southwest or by virtue of its own pressure, some experts forecast that the super magma cell under the New Madrid Fault could 'split North America in half'. At a minimum, it would shift the route of the Mississippi River and its tributaries accelerating drainage of the Great Lakes and likely send a cloud of ash aloft which could affect weather worldwide as Krakatau (or Krakatoa) did in 1883. Right now, clusters of earthquakes according to several scientific sources including the US Geological Survey (USGS) and *ENE News*, indicate that the Yellowstone Caldera is an incident waiting to happen while volcano activity around the Pacific Ring of Fire is reaching levels not seen in decades. New fault lines are being revealed along the west coast of North America by advanced instrumentation (US Geological Survey source).

Uncontrolled Nuclear/Radioactive Release:



Disaster at Fukushima nuclear plant in Japan. Courtesy of Flickr, <https://www.flickr.com/photos/vizpix/5555742141>

North America has already experienced a near nuclear disaster at Three Mile Island. Ontario's Darlington and Pickering nuclear plants on the shores of Lake Ontario are situated on known geologic fault lines. Japan's FUKUSHIMA disaster has led to ongoing poisoning of the Pacific Ocean by continuous uncontrolled daily discharge of thousands of gallons of radioactive water and waste from the three failed reactors. Scientists now estimate that Fukushima is 70% larger than Chernobyl (*ENE News*). There are increasing reports of unusual Pacific Ocean fish contamination from caesium

137 (a product of Fukushima) as well as strange diseases among other marine life. According to local Alaskan and BC community newspapers, unexplained mass fish die-offs are occurring along Canada's and the America's west coasts (*LA Times* 25 Feb. 2016). The coats of seals are showing unusual blotching; sea lions are dying off *en masse*; polar bears coats are becoming blotched as well (*Journal of Wildlife Diseases* Jan. 2015). While the Woods Hole Oceanographic Institute research suggests the current level of radiation is absorbable without grave consequence to the Pacific waters, the long-term effects may be beyond measure and the impact upon fisheries and coastal communities could be disruptive. If a major health crisis for Western Canada were to develop over the long-term, Canada's military, especially its nuclear and medical teams, could be mandated to help.

Severe Economic Breakdown:

An extended period of economic downturn, now forecast by some financial experts, could result in significant unemployment, bankruptcies, with attendant social disruption, dislocation and migration pressures. Deployment of Canadian forces to maintain order must be considered a possibility. Extensive Civil/Military Cooperation (CIMIC) training becomes essential in such circumstances.

Pandemics:

As mutant strains of biological agents become increasingly resistant to antibiotics and new viruses appear, the risk of an international pandemic from either 'natural' or terror inspired source increases significantly. The sociological and economic effects could well overwhelm current plans and resources resulting in major social upheavals and uncontrolled migration. Canada's military, particularly its DART teams, could be called to assist while its members could be adversely affected also by the breakout.

An Overly Partisan Approach to Defence Policy:

Canada's peoples are diverse in backgrounds, histories and beliefs. Government is by nature partisan as a result of the structure of our representative democratic system. Yet when it comes to matters of defence, whether domestic or international, all Canadians face the issues together. Thus, while a partisan government may have the responsibility of setting policy to defend the countries interests, defence commitments, procurement, recruitment and training of personnel all transcend the policies of any one government's electoral mandate. Defence policy development needs to be bipartisan and enduring. Piecemeal partisanship wastes money and produces poor protection of Canada's people and military personnel. Hence, overarching defence policy development calls for a nonpartisan approach in the view of several defence policy analysts and retired senior officers consulted for this commentary.

IMPLICATIONS

It is impossible to predict which of these international, domestic or other as yet unidentified threats will occur and to what degree. But ignoring the possibility of one or more of these major threats occurring, perhaps coincidentally, within the next two or three decades, would be a failure in planning, and preparation, and implementation to provide reasonable protection and threat response for Canada's people.

Canada and its military have a history of responding quickly to threats to safety and wellbeing, but better preparation and planning would greatly facilitate the success of the response. Many of these events are come as you are in nature. With our country's overall experience, expertise and the technology available today, there should be little excuse for lack of capability. Planning and training priorities must emphasize resiliency in the face of multiple threats. It is heartening to see this need recognized in the new Defence Policy; concerted action will make it a reality.

PART III: SPECIFIC GEOGRAPHIC SECURITY CONSIDERATION and ANALYSIS

Each of Canada's four distinct borders, namely the Arctic to the North, the East Coast, the Southern border and Alaska with the USA and the West Coast present distinct challenges. While each of these borders may be well policed by the RCMP, the Canadian Border Services Agency (CBSA) and the Canadian Coast Guard (CCG) (as well as American authorities) each prompt potentially different postures for the CAF.

Challenges of the Arctic

Climate change and international competition for resources means that the Arctic region will become increasingly important to a burgeoning world population. The Arctic is shared with four other countries, namely the U.S., Russia, Norway and Denmark. The USA, as well as Russia and even countries like China and South Korea have expressed great interest in and are expanding their influence in the Arctic particularly in the light of opening up the North-West Passage. The North-East Passage through Russian waters is already open and utilized. Comparatively speaking, Canada's Arctic region is under populated and composed of an historic mix of native Inuit, Inualivit and more



Russian icebreaker. Courtesy of Wiki Commons, https://upload.wikimedia.org/wikipedia/commons/f/f5/Yamal_2009.JPG

recently First Nations, followed in the last few decades by Canadians from the south. The Canadian Arctic economy, once tied to living with the land, is now largely dependent upon government activities and payments. The Canadian military had a significant impact on Arctic development in the 1950s with the construction of the Distant Early Warning (DEW) line. The 1980's saw extensive oil and gas exploration. Today, the Canadian Arctic economy is but a shadow of those days, with government presence largely confined to regulation making, health and education services, benefit payments and an annual visit by the then current Prime Minister.

In the view of Scott Gilmore in Maclean's Magazine (March 10, 2017): *"we have all but abandoned our northern marches—we have no port in the Arctic, no four-season icebreakers, and almost no military presence. In fact, the Russians would have an easier time reaching some parts of Canada's northern territory than we would."*

Communities are small and facilities meagre. Schooling is minimal with the majority of students leaving at Grade 7 and teachers leaving after one or two years, with a few worthy exceptions. Most communities are connected by air only. Airports are the lifeline for most communities except for those few that may be reached by summer shipping or winter ice roads. Climate change is adversely affecting the duration and reliability of winter ice roads. Military facilities are small and considered hardship postings. Some local Inuit and First Nation youth are organized into 'Ranger Companies' which are run part-time by military personnel but are not considered a formal part of the Canadian Army.

Canada has and makes substantial Arctic Claims, *but has little physical presence to justify or capability to defend them.* In a world of fierce competition for resources, fewer people live in Canada's relatively vast Arctic than live in Alaska, America's furthestmost northern State. Taken together, the total population of the major Canadian Arctic communities (Inuvik, Aklavik, Tuktoyaktuk, Whitehorse, Cambridge Bay, Resolute, Rankin Inlet, Povungnituk, Nanasivik and Iqaluit and more), barely equal the number of people living in the suburbs of Murmansk, Irkutsk or Novosibirsk in Russia.

Canada's claim to the Arctic rests *largely* on the citizenship and loyalty of the Aboriginal peoples of the region and some land claim agreements, as well as no disputes from other nations as yet. But in this age of World Court arbitration, it is interesting to note that a Canadian Government has never signed a treaty (unlike with southern First Nation peoples) with the 'original peoples' of the Arctic in respect of their potential claims to the lands, waters and other resources of the region they have occupied for eons before the arrival of Canadians from the south. Land claim agreements may not have that same legal stature as treaties in a World Court. According to several Aboriginal leaders with whom the authors have spoken, **Chinese interests have expressed interest in backing Canadian Aboriginal mineral and water claims in the court system.**

Annual visits by Prime Ministers and token Ranger units of partially trained indigenous youth (only recently equipped with modern bolt action rifles) do not provide much support for a legal claim nor for its defence. In the past five years alone, Russia has deployed an army division to Eastern Siberia, commenced work with China on improving the trans-Siberian railroad, deployed air wings of additional fighters in rebuilt Northern bases and of course continued supplying Northern outposts using nuclear powered ice breakers secured by regular cruises of nuclear submarines under the polar ice. As well, the US recently announced plans to expand its Arctic presence.



Recent Russian Arctic Military Developments. Courtesy of Foreign Policy Review

If Canada is to secure full legal international recognition of its claims and demonstrate credible defence therefore, it needs to:

1. Create unassailable legal agreements with the original peoples of the Arctic or be prepared for foreign financed challenges to Canada's legal claim to its Arctic region and its resources;



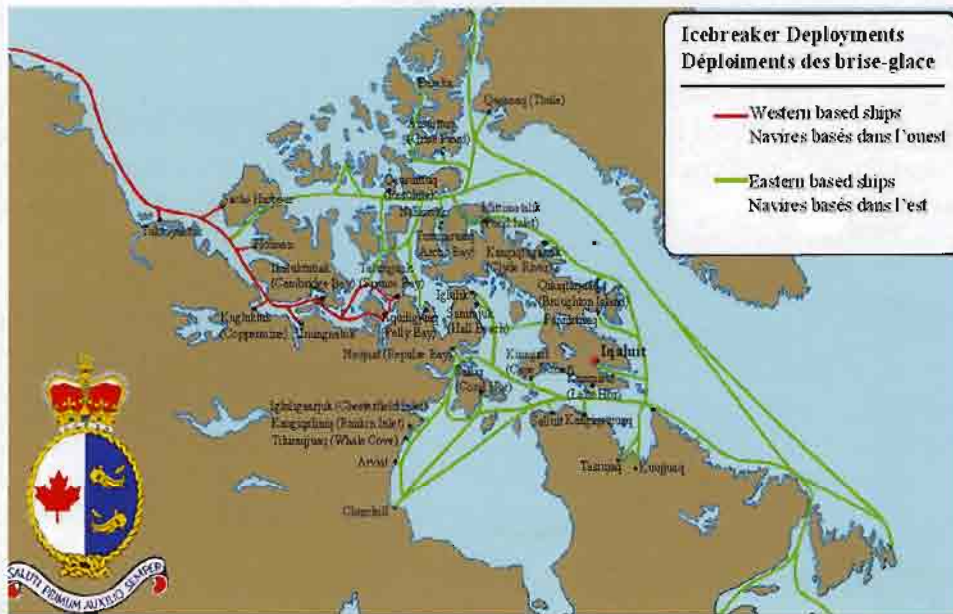
Map of communities in Canadian Arctic. Source: Wikipedia

2. Create and staff **at least two fully functioning, permanent Arctic bases of credible size** (see red arrows on map), with fully operable air, naval and land units on station with ice breaker capacity comparable to that of Russia. The Nanasivik naval port is the first step while Inuvik could be the second at the other end of the North-West Passage, some 1800 distant;
3. Ensure international recognition and acceptance of military rules for emergency access to Canadian arctic bases for malfunctioning airplanes or stranded ships which may transit the Canadian Arctic and Northwest Passage in greater numbers;
4. Increase surveillance in the Arctic using modern drone and sensor technology as proposed;



Predator drone. Courtesy of Wiki Commons,
https://upload.wikimedia.org/wikipedia/commons/3/33/MQ-9_Reaper_-_090609-F-0000M-777.JPG

Arctic Operations/Opérations dans l'Arctique



Canadian Arctic icebreaker transit route. Source: CCG

5. Ensure that Canada's fleet of icebreakers is updated and modernized and that the promised new build schedule is fully supported. While 'global warming' may reduce ice coverage, if Canada is to demonstrate its sovereignty in the Arctic as well as control access through the North-West Passage, it must have armed ice-breaking capability comparable to that of Russia. (See Appendix D for more detail.)

The East Coast



New C-295 aircraft. Courtesy of Wiki Commons, https://upload.wikimedia.org/wikipedia/commons/9/9e/CASA_C295_Polish_AF_014_frontleft.jpg

The principal defence related threats on the East Coast might arise from possible conflicts among European nations or disagreements over the Canadian fisheries. Long range drones can be used for routine coastal patrol, supplemented by the newly purchased C295 patrol aircraft. Seaborne patrol, protection and interdiction in ice-free waters can be provided by two or three well designed littoral ships (close-in shallow draft) of the type now being constructed under Canada's National Ship Procurement Strategy (NSPS). Over the longer term, more consideration should be given to off the shelf procurement from allies such as the USA for reasons of cost and compatibility.

For example, American littoral combat ships vessels are equipped with a full suite of

compatible modern radars and electronics, ASROC (anti-submarine rocket) and anti-air armament, armed helicopter capability and a small naval gun. Canadian versions of such ships could be updated simultaneously with those of the American fleet under appropriate procurement terms. In another case, which bears upon the deployment considerations of this report, the previous Canadian government did

not pursue an opportunity to acquire two purpose-built integrated combat/disaster support ships when France cancelled its planned sale of two MISTRAL² combat ships to Russia and sold them to Egypt.

Support from at least two Class 3-armed ice breakers is also warranted on the East Coast due to the likelihood of increased traffic through the North-West Passage.



Canadian icebreaker CCGS Amundsen. Courtesy of Wiki Commons, https://commons.wikimedia.org/wiki/File:CCGS_Amundsen.jpg

² The *Mistral* Class are pretty amazing ships. Not because they offer any sort of new capabilities that other amphibious flattops don't, but because they offer great capability for their price, costing around \$700 million each. They also have much lower their operating costs when compared with say an American *Wasp* Class LHD, which only enhances their reputation for value.

The Southern Border



Illegal migrants crossing the US-Canada border into Canada. Courtesy of *Global News*,

http://i1.wp.com/media.globalnews.ca/videostatic/402/319/WB_GOOD_ALE_FEB_26_848x480_885196355687.jpg?w=670&quality=70&strip=all

It is often said that Canada enjoys the longest undefended border in the world with its nearest neighbour. In recent years, major Canadian concerns involving its southern border with the United States have focused on illegal drug trafficking, criminal importation of other prohibited items such as guns and illegal tobacco a few years ago. Illegal immigration has prompted some concern as well. Recent arrivals from the USA crossing without the formality of going through well identified normal border control posts have raised some new questions. There seems, however, little justification to

reinforce this border for reasons of defence. Canada's southern border seems well policed by the RCMP, the Canadian Border Services Agency (CBSA) and the Canadian Coast Guard (CCG) and local police agencies (as appropriate) as well as by US agencies.

But, according to American mainstream media and even alt-media, the American populace has, not for some time, been so split, divided or polarized over political issues as they are today. Since the American Civil War (1861-1865) more than 95 race-based or major labour conflicts occurred in the USA, before sustained anti-Vietnam War demonstrations occurred over half a decade in the 1960s. By comparison, Canada has had relatively few with the recent exception of the Balkan War, Tamil, G20, and First Nation 'Idle No More' protests.

However, in the last six years, there have been more than 25 riots recorded in many U.S. cities, from Ferguson to Baltimore and beyond, related to police shootings, occupations and Presidential campaign events. **America could become a tinderbox.** The outcome of the 2016 Presidential Election left large segments of the American populace unhappy. America has a startling history of civil strife. Renewed social conflict seems predictable, almost inevitable. Some commentators go so far as to predict conflict among well-armed elements of the American population and secession is openly promoted in some states (Texas; California).

Should civil strife in the USA grow significantly, renewed attention would need to be given to the defence of Canada's southern border. As a related issue, renewed attention should be given to Canada's immigration and refugee policies and the application thereof. How will Canadians treat larger numbers of undocumented refugees or those from other countries arriving from the US where their asylum requests have been declined?

The West Coast

Canada's west coast could be more vulnerable in the future than today. A future major war in the Far East involving such countries as North Korea, South Korea, Japan, China, Vietnam or even India or Russia is entirely possible and may include the use of nuclear weapons.

It is conceivable that such a war might result in an armada of small seagoing fishing boats, coastal freighters and similar vessels showing up on Canada's West Coast to offload desperate refugees. A looming conflict on the Korean Peninsula might well be a source of desperate refugee flight. Australia experienced such events in the post-Vietnam War years and during the Cambodian genocide. Since Canada's west coast is so huge with many fjords and inlets and so little population, local and national authorities might not even be aware of refugee presence for a substantial period of time. In the meantime, smuggling is likely to remain a lead concern of the Coast Guard and local police.

Space



View of central Canada/US from space. Courtesy of Wiki Commons,

https://upload.wikimedia.org/wikipedia/commons/thumb/c/cb/A_view_of_the_Great_Lakes_from_space_%2815010937869%29.jpg/1280px-A_view_of_the_Great_Lakes_from_space_%2815010937869%29.jpg

Canada's airspace is a critical defence area. Airspace is a three dimensional void providing an operational arena for changing weather patterns, a playground for satellites, missiles and aggressive aircraft as well as transit routes for international commercial aircraft from a multitude of countries.

Domestically managed navigational and Identification Friend or Foe (IFF) systems play an essential role as do North American Aerospace Defence Command (NORAD) managed radar systems. At operational aircraft

altitudes, conventional defence in the form of fighter aircraft and missiles form the backbone of current defence, although Canada is totally reliant on the USA for ground based missile defence. Today and more tomorrow drones and autonomous systems will play an increasingly critical role for remote observation. Fortunately, the new Defence Policy appears to include acquisition of both the air defence missile and autonomous systems.

At higher altitude, low orbit commercial and military satellites provide a range of essential services ranging from weather, navigation (GPS), television, financial and cellular systems to identification of potential aggressive actions towards North America. Such systems are vulnerable to Coronal Mass Ejections (CMEs), Electromagnetic Pulse events (attacks), militarized satellites and laser attacks.

Intercene War and Failed States

Likely the most common future international problem of interest to Canada for either cultural, moral, or commercial reasons, other than outright war, will be that of intercene war between smaller countries and/or Failed States. While unlikely to Canada's immediate south, these could be expected to occur in the Middle East, Africa and the Caribbean Region, including the north shore of South America. Colombia appears to have turned away from such problems while Venezuela seems to be heading there.

Other state-to-state conflicts in South America are possible too. Canada's involvement in the Organization of American States (OAS) and the L'Organisation Francophonie may well prompt opportunities and/or calls for Canada's military support

PART IV: OVERALL CAF CAPABILITY TODAY

"There are only about 200 combat effective members of the Royal Canadian Dragoons today; other regiments are in bad shape too and many Reserve units are down to 25 to 35% of authorized strength," a retired Canadian senior officer speaking off-the-record stated.

The newly announced Defence Policy of the Canadian Government seems to have sharpened the focus of the purpose and needs of the CAF. Certainly, the past two decades of procurement programmes are a testimony to conflicting assessments, confused priorities, on again/off again planning, overly complex RFP processes and unreasonable delays. Critical equipment purchases have been ignored or delayed for years, even decades, and then rushed to avoid embarrassing and potentially more fatal inadequacies: e.g. Sea King helicopters; Iltis vehicles; MRAP (Mine Resistant Armor Protected) vehicles. It would appear that the new Defence Policy recognized these problems and proposes to address them systematically. The proof of the pudding...

In the opinion of some with whom the authors spoke, the Regular (full time) Force treats the Reserves much like a 'free candy store;' it takes what it wants and leaves the rest, in terms of both personnel and equipment. That may be a bit of hyperbole, but the experience of the last three decades make it abundantly clear that:

1. Reserve personnel are used principally to 'fill out the ranks' especially in response to local unexpected events and major deployment rotations;
2. Neither past governments nor the 'General Staff' have had and implemented a long-range plan for the role and capability of the Reserves and/or for that matter, the Rangers.

In the opinion of several parties with whom the authors spoke, the CAF has become a 'large body with small claws.' The high ratio of 'paper pushers' to 'trigger pullers' in any of the three main services impairs effective deployment of capable operational forces. The proposed build in operational numbers and capability appears to recognize and address this issue.

For some the military is a calling; for many others, it is a 9 to 5 job. In the 1990s some personnel standing on the wharf in Halifax as they deployed for Op Salon were heard moaning, "This is not what I signed up for," according to a retired officer who was present.

In years past, there seems to some that there was a loss of focus on the holistic needs of combat personnel. Significant numbers of combat forces have come back from real combat in Afghanistan suffering from Post-Traumatic Stress Disorder (PTSD). The new Defence Policy thankfully makes provision for increased personnel and budgetary support in this area. The recently announced government Defence Policy appears to recognize and address this concern.

A renewed focus on recruitment and training including both psychological as well as tactical/operational support is increasingly critical in the modern army as the complex nature of both peacekeeping and war making change each year. It is not hard to imagine the level of PTSD a soldier might experience having

to shoot an attacking 12-year-old youth armed with an AK47. Peacekeeping is clearly not what it was 45 or 50 years ago. For example, Canada has recently developed new rules of engagement in dealing with child soldiers.

In the past, large segments of the Canadian Forces personnel came from smaller towns and cities; indeed, whole regiments came from the same community. While significant deaths and injuries to yesterday's soldiers had perhaps as great physical and emotional effect on the individual as those treated today, the effects on the community were felt and shared by all. Returning combat veterans had their local communities and even their local Canadian Legions to provide understanding and comradeship. Soldiers from largely more urban areas today face more complex military, social, technological and legal demands than their predecessors. Their individualized experience of social support seems much less. But today, as in the past, their compensation and their post-service treatment, however, has not reflected their value.

In the effort to improve CAF recruitment, enhanced attention needs to be paid to the different psychological profile and social culture of modern cyber oriented youth compared to the needed kinetic profile of past warriors.

Yet, for some inadequacies and challenges, Canada's Armed Forces are well regarded internationally and generally viewed with respect and appreciation at home, as they have gained a reputation for reliability, toughness and kindness when appropriate among their international peers.

CYBER-SPACE CAPABILITY: FUTURE POTENTIAL or NECESSITY

Cyberspace "opens wide asymmetrical possibilities for reducing the fighting potential of the enemy." Russian General Valeri Gerasimov, National Post, p. A10, March 10, 2017

Cyber based systems are revolutionizing warfare capability as well as security operations such as contemporary peacekeeping concepts. The development of cyber systems and robotics will change the very way militaries are composed, trained, deployed, supplied and operate. Rapid development of artificial intelligence requires distinct attention and integration into all relevant elements of the CAF, if for no other reasons than to provide Canadian military with competitive, preferably superior, systems to that which they will encounter in their defence of Canada as well as potential participation in selected international deployments. Artificial Narrow Intelligence (ANI) is already in some use for specific repetitive tasks or systems such as encrypted communications, targeting systems and logistics management. Artificial General Intelligence (AGI) the self-learning and adaptive AI is developing quickly and will be seen very soon in applied combat systems in the battle space. Robot 'soldiers' are not decades away. Artificial Super Intelligence (ASI) exponential self-learning, adaptive, autonomous intelligence systems are forecast to be operative in the 2030 to 2050 time range. Military application of ASI will revolutionize the security, defence and combat arenas. Human powered (the soldier) and mechanical systems (tanks, artillery, ships, current aircraft) will be operationally enhanced, supplemented, if not replaced by AGI and ASI systems. Such concepts must be factored into defence planning.

The soldier of just yesterday is rapidly changing as are many of their tasks. Speaking of the need for enhanced cyber capability in the CAF, Brig.-Gen. Paul Rutherford stated *"we want to bring people into the trade to become what I call cyber warriors. To retain these experts, we need a career path for the duration of their careers... We want a breadth of cyber operators. We need analysts who can*

understand...we have to invest heavily to ensure that from a cyber perspective we can anticipate and bolster our defences." (National Post, pg. A9, March 10, 2017). There are great opportunities to involve brilliant students by collaboration with technically oriented universities like the University of Waterloo or the Nova Scotia Technical Institute (see the "Developing the Necessary Leadership" section below).

Two sober notes of caution: Some fear that the development of AI may outstrip humanity's ability to control it, which if accurate, would make planning by humans largely irrelevant. Conversely, another perspective suggests that the development of AI may be circumscribed, perhaps radically slowed down or stopped, by events beyond its technological space. Such diverse events could include widespread economic downturn or civil chaos prompted by stimuli as different as major weather events, pandemics or collapse of interlocking financial derivatives with resultant international impact.

*If the Third World War is fought with robots
and nuclear weapons, the next war will be fought
with sticks and stones
(paraphrasing Albert Einstein)*

THE ROYAL CANADIAN NAVY (RCN): Eliminating the Fog

Although the Royal Canadian Navy was once a 'blue water' navy, today and for the foreseeable future, most Canadians would expect that the principal role of the RCN, with a few exceptions, is and will be coastal protection and support for the Coast Guard. Perception of the RCN as a blue-water navy may exceed the grasp of financial merit. The RCN will benefit materially from the replacement of 12 existing combat ships under the National Shipbuilding Procurement Strategy (NSPS). Once the management and integration problems are resolved, the ships built and commissioned over the next decade plus, will be



HMCS Calgary Canadian Navy frigate. Courtesy of Wiki Commons, [https://commons.wikimedia.org/wiki/File:Canadian_navy_frigate_HMCS_Calgary_\(FFH_335\).jpg](https://commons.wikimedia.org/wiki/File:Canadian_navy_frigate_HMCS_Calgary_(FFH_335).jpg)

supported by 2 leased non-combat capable supply ships (which are then to be replaced at considerable capital cost by newly built ships). The commitment of the current government to this program is reassuring.

When rebuilt, the surface fleet of the RCN will be in the best shape it has been in decades. With the addition of potentially 6 new ice breakers of three classes (none nuclear) over the next decade, the RCN should have a modest, but not robust, capability to effectively monitor and protect Canada's coasts, on the surface. Clearly, any international deployment in support of NATO or other

coalitions will draw down on that overall coverage unless well supplemented by drones and aircraft.

Design of the proposed new supply ships should incorporate the capability to support Canadian Army personnel serving in remote locales where airstrips may be unavailable. Helicopter or other vertical lift aircraft will play a role in supply and exfiltration if needed. The US Marines have addressed this circumstance with Osprey aircraft and specialized support and supply ships. This is an important capability, which Canada does not have currently, consistent with the role of rapid deployment as

envisioned herein and by the new Defence Policy.



Austal rapid deployment supply ship. Courtesy of Austal, <http://www.austal.com/news/austal-delivers-high-speed-offshore-crew-transfer-vessel>

Other problems for the Navy remain under water; namely the reliable deploy-ability of the four-unit submarine fleet. Ideally, these ships would have the ability to quietly patrol the navigable Northern waters in particular for lengthy periods of time. In the current circumstances, this is not a likely capability due to unreliability issues. If the Navy is to retain submarine capability,

it and the Government must decide on either significant further investment in the current fleet or undertake to replace part or all of it within the next decade. Fortunately, the government's new Defence Policy proposes reasonable upgrades and enhancement of this fleet.

The effectiveness and the operational life of the capital intensive and high maintenance surface and sub-surface fleet could be likely extended and enhanced by the supplemental use of both land-based and ship-borne remote controlled drones for patrol and reconnaissance.



Concept design for possible new Canadian frigate. Courtesy of Naval Today, <http://navaltoday.com/2012/07/11/new-ships-for-royal-canadian-navy-underway/>

THE CANADIAN ARMY (CA): Climbing over Obstacles

Afghanistan combat experience restored pride in Canada's ground forces after the debacles of Somalia and Rwanda. Today elements of the Army are deployed in Latvia, the Ukraine, Iraq and in Africa. In each case with the exception of Latvia, there are less than a 1000 soldiers in place.



Canadian Leopard 2 Tank. Courtesy of Wiki Commons, https://commons.wikimedia.org/wiki/File:Leopard_C2_Canadian_Forces.jpg

Until WWII, the Canadian Army was largely trained civilian volunteers with only a small professional officer corps and a small training cadre. Today Canada's army, while still volunteer, has one of the most 'top heavy' armies in the world supported by a large bureaucratic 'body' and undernourished 'claws'. Future pension costs of such an organizational structure may well be staggering.

Built on the historic largely locally based regimental system, it benefits from the pride and identity thereof, but suffers from some regimental cultural practices and biases as a result. Rotational deployments have not always been as smooth as would have been expected due to inter-regimental rivalries. Regionality also plays a political role in the selection of base locations, assignments, deployments and even Rules of Engagement (ROEs).

In the opinion of many of those with whom the authors spoke, scattering the CAF in many different areas/bases, instilling over rigidity in some skill assignments, and not taking an integrated approach to operational assignments are no longer the most effective uses of personnel and capability. The effectiveness of the CA and its usefulness to our allies would benefit from a more focused army well integrated with and supported operationally by the other two main services. The United States Marine Corps provides a useful general model albeit under a centralized command structure.

THE ROYAL CANADIAN AIR FORCE (RCAF): A Potential New High



F-35 Lightning II. Courtesy of Wiki Commons, https://upload.wikimedia.org/wikipedia/commons/e/c8/F35A_Prototyp_AA1_2.jpg

The principal role of the Royal Canadian Air Force is the protection of Canadian airspace including coastal areas in conjunction with the Navy and Coast Guard, and operating as a partner in NORAD. Its secondary role is to support the other Canadian Forces air transport requirements. Support of ground combat operations ranks a more distant third and support of civilian authorities in times of domestic disasters would be considered a fourth role.



CF-188 fighter. Courtesy of Wiki Commons, https://commons.wikimedia.org/wiki/File:CF-188B_410_Sqn_in_flight_over_Utah_2001.JPEG

The Royal Canadian Air Force is equipped with 79 operational multi-role fighter aircraft (CF 188 A&B), soon to be expanded by the purchase 18 redesigned version, generation 4.5 aircraft - the F18 Super Hornet. The two aircraft are not interchangeable; nor do they share common essential parts. They do, however, appear to reduce a capability gap.

Some current CF18's are to be upgraded but not to full Super Hornet capability. The Super Hornet is not fully competitive with the fifth-generation attack aircraft potentially used by the most likely aggressors Canada would face, nor is it well protected against contemporary mobile long range anti-aircraft missiles (Russian S300,

400, 500 systems) in use by potential major aggressors. Thus, the government proposes to have a competition for a more advanced fighter with the intention of having the winner operational by the mid-2020 decade, for a total of 88 combat aircraft.

Looking ahead to a decision on the F35 or its equivalent, it is easy to remember the 20 year debate on the replacement of the aged Sea King helicopters or the questionable sale of Chinook helicopters in the 1990's only to be repurchased for Afghanistan less than 2 decades later. But does Canada really need a new and as yet unproven Fifth-Generation fighter aircraft, or would a 4.5 generation aircraft with

regularly upgraded avionics and armament suites be sufficient for the next 30 years? There are only two countries outside of North America that could realistically challenge North American airspace. Against these enemies, the small RCAF standing alone would be but a short impediment - a speed bump - to domination of the battle space even equipped with a 5th generation platform. Clearly, we must work collaboratively with the United States to defend our airspace against any significant threat. This reality must be realized when considering the future equipment requirements of the RCAF.



F-18 Super Hornet. Courtesy of Wiki Commons, https://upload.wikimedia.org/wikipedia/commons/3/3e/FA-18_Hornet_VFA-41.jpg

The key question then becomes, what is the RCAF's 'best affordable defensive role'?



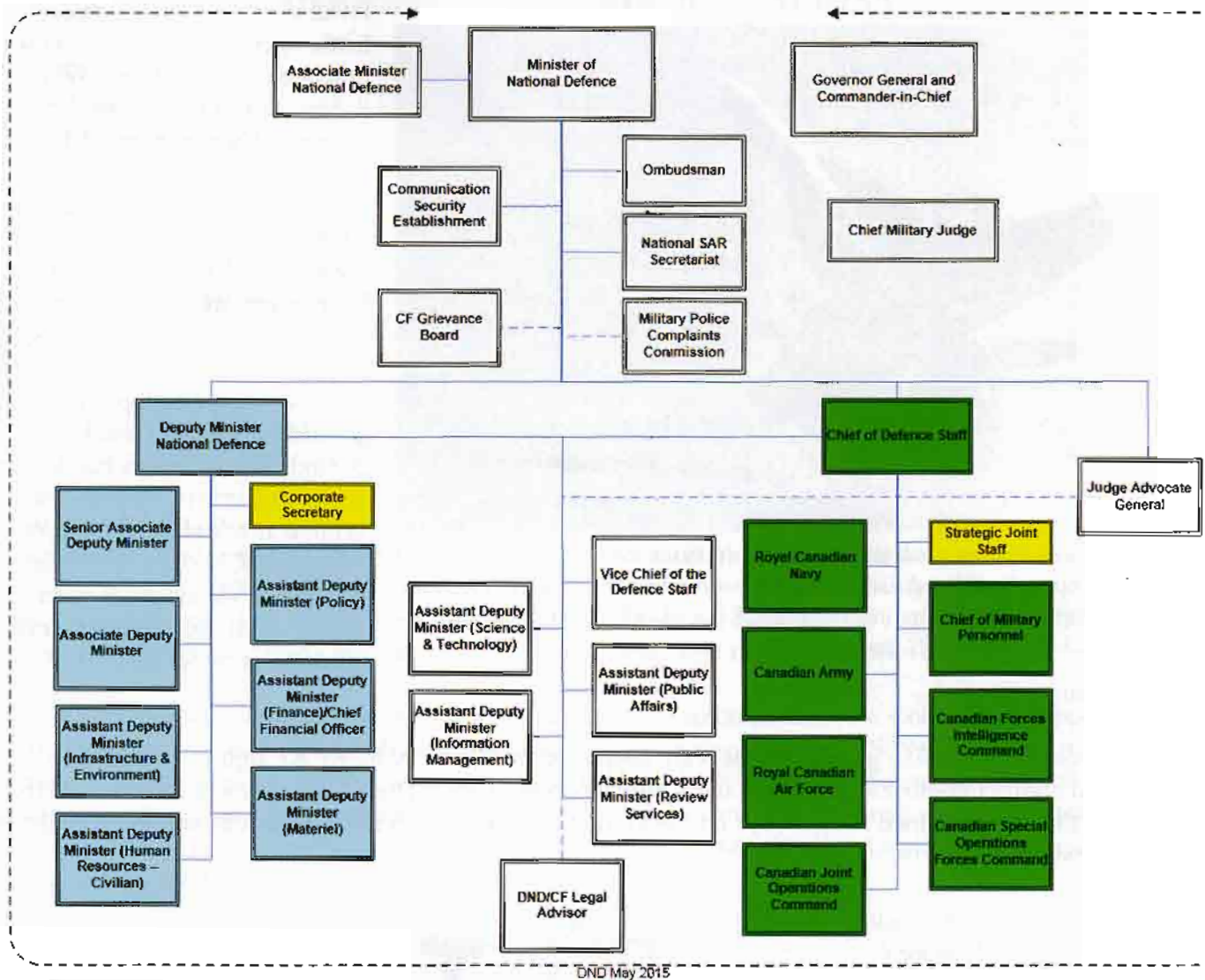
Boeing C-17 Globemaster III in Afghanistan. Courtesy of Wiki Commons, https://upload.wikimedia.org/wikipedia/commons/1/12/RAAF_C-17_Afghanistan.jpg

Army personnel, especially in foreign locales, will require added vertical lift/helicopter support or contracted capability from allies.

In comparative terms, the most evident *other* technology gap in the RCAF is the lack of larger remote controlled drones to supplement and extend coastal patrol capability, to conduct remote Arctic searches, to provide environmental monitoring in support of civilian authorities, and to provide combat reconnaissance and attack, if necessary, in support of ground troops. In this latter role, weaponized drones can replace attack helicopters to a considerable extent, thus providing air support to Canadian ground troops, in both 'peacekeeping assignments' and combat situations. It would appear that these needs and capabilities are being recognized in the new Defence Policy.

Canadian transport aircraft have been aging, but the RCAF can look with pride at its 5 C17s and the acquisition in 2010 of 17 Super Heres to go with the aging C130's. The recent and long overdue announcement to acquire new coastal patrol aircraft (C245), although not uniformly praised, is a welcome addition to capability. While Canada added to its transport helicopter fleet in the past few years, an absence of attack helicopters means reduced support available for troops on the ground. Significant deployment of

The Current Structure of the Canadian Forces:



The current structure of the Canadian Armed Forces. Courtesy of DND. NB: The CCG reports to the Minister of Fisheries, Oceans and Coast Guard.

Under the immediately previous Canadian Government, the separate identity of the three principal services of Canadian Forces was restored - the RCN, the CA and the RCAF - having earlier been

integrated into a 'Total Force' concept by prior governments. While the uniforms were changed and then changed back again, the actual organizational structure changed very little in functional terms. Each of the three services retained its own separate command and well defined principal roles. At the operational level, even less change occurred.



F-18 Super Hornet. Courtesy of Wiki Commons, https://upload.wikimedia.org/wikipedia/commons/9/9d/FA-18E_Super_Hornet_landing_on_USS_Kitty_Hawk_%28CV-63%29_-_080423-N-7883G-107.jpg

Little operational integration was practiced or considered. When deployed to Afghanistan for example, Canadian ground combat units were not directly supported in combat by Canadian combat attack helicopters. At present, the RCAF has no attack helicopters. RCAF C17 and Chinook transport helicopters, acquired later in the deployment, may have helped supply Canadian ground forces, but Canadian ground combat troops had to rely on the availability of coalition ground attack aircraft for combat support. RCN ships were busy with other valuable coalition assignments, but they were not working in direct support of

Canadian troops.

More recently, Canadian ground troops were supported occasionally by RCAF fighter aircraft in potential conflict/combat situations in the Kurdish region of Iraq. The RCAF was withdrawn in 2016, leaving the highly trained JTF2 troops on the ground to seek support from American and other coalition aircraft when needed.

Given current commitments to NATO, the fast-evolving nature of military conflicts and the present government's apparent desire for Canadian forces to have a greater presence in areas of potential or actual conflict, a more integrated approach to the operational command and deployment of Canadian Forces is appropriate. The Defence Policy of the current federal government endorses the deployment of Canadian forces to international 'trouble spots' in either a pacification or combat role.



Apache helicopter. Courtesy of Wiki Commons, https://upload.wikimedia.org/wikipedia/commons/1/1d/Westland_apache_wah-64d_longbow_zj206_arp.jpg

PART V: SUGGESTIONS FOR CONSIDERATION

TRI-SERVICES RAPID RESPONSE BRIGADE/BATTALIONS³

Today, the US Army is exploring a new concept of future combat called Multi Domain Battle, which calls for small, agile units designed to overwhelm the enemy with coordinated actions not only on the land, but in the air, on the sea, and in space, cyberspace and the electromagnetic spectrum. (*BREAKING DEFENSE*, March 29, 2017) For more commentary, see Appendix C.

In order to meet Canada's existing and potential international commitments as well as to provide required national defence and support to civilian authorities' priorities, the creation of 3 Tri-Service Rapid Response Brigades (RRB) is proposed herein. This proposal is consistent with the new Defence Policy's plan for 2 fully deployable '1500 personnel units' (brigades) and a similar third ready for rapid composition.

The three RRBs would be built upon the exacting training approach of the Joint Task Force Two (JTF2) and raised to a performance level nearing that of the existing Special Operations Regiment, which itself could be the core of one RRB.

Canada neither needs nor can afford a large general service military. What it can develop and maintain are smaller units consisting of highly trained personnel with multi-modal capability. The US Marine Corps provide an operational model worthy of examination. Three Brigades are required actually to provide the full rotation cycle - one deployed; one in training; one in rest and recovery.

Building upon the vision of General Allard in years past, their international role would be to support legitimate governments or other such civic organizations as approved by the UN/NATO and to restore or maintain order. These integrated units also would be capable of disaster response, assisting civilian populations with needed humanitarian services such as medical care, food and restoration of essential services on a more operationally co-ordinated basis, both abroad and at home. Contingent funds should be budgeted for such operational assignments as a matter of course.

Personnel would be drawn from existing regular and reserve regiments and train together for a minimum of 6 months per year. Advantage should be taken of Canada's diverse linguistic peoples in recruitment as well. Core training would include Arctic and desert warfare as well as urban conflict. Elements of these units would have enhanced training in cyber warfare and counter terrorism. Cross training and careful psychological conditioning must be provided to maximize individual potential while reducing the possibility of PTSD and other combat related issues. Individual adaptability and resilience as well as prompt and effective response by unit and local commanders must be instilled and supported. In many situations, there will be no time for clearance or orders from HQ's, hence individual initiative will be encouraged. This strategy will focus on the concept that ultimately, people not machines, win conflicts.

³ A company typically has 100 to 200 soldiers, and a battalion is a combat unit of 500 to 800 soldiers. Three to five battalions, approximately 1,500 to 4,000 soldiers, comprise a brigade. Thus each RRB would have about 4500 personnel including support to cover three rotations. Three RRBs would total roughly 13,500 to 15,000 personnel including support combat air, artillery, medical, communications and relevant logistics personnel.

Ground transport and combat support would be provided by well armoured high mobility vehicles to maximize troop protection.

Parachute and air mobile training would be a requirement for all combat related specialties. Each RRB element (rotation) would be battalion sized (3 combat capable companies plus support) totaling about 800-1,000 soldiers in terms of combat personnel equipped with light armour and artillery as well as armed medium-lift helicopters. It is anticipated that up to 20 percent of the personnel would be reservists employed under a minimum 3 year contract, thus supporting two full rotations. If there are not sufficient reserve personnel available, Canada could consider a provision to provide accelerated citizenship to immigrants who have appropriate military training as other militaries do.

Locally organized and based, Reserve units have been historically separate from Regular Force regiments yet they are nominally tied for personnel resupply to the Regular Force units. So a Reserve member 'gives up' unit identity when moved to a Regular Force unit, for the period they are so deployed. When released they return to their original unit.

This practice does little to build long term unit cohesiveness.



French Mistral-class amphibious helicopter support ship. Courtesy of Wiki Commons, https://commons.wikimedia.org/wiki/File:BPC_Dixmude.jpg

Bringing them more together in the RRB could build greater cohesiveness in the operational unit, and in the home Reserve unit over time. This approach is not to be confused with the generally unsuccessful Total Force concept of the 1990s.

Since the innovative capability desired for the RRB is rapid and sustained deployability, in a combat, peacekeeping or disaster response role, it is recommended that the Tri-Service RRBs be supported by supply/support ships capable of landing, supporting and withdrawing the brigade on any coast with or without harbours. The French built MISTRAL amphibious helicopter assault/support ship could be almost ideal for this role.

A Mistral-class ship is capable of transporting and deploying 16 NH90 or Tiger helicopters, four landing barges, up to 70 vehicles including 13 AMX Leclerc tanks, or a 40-strong Leclerc tank battalion, and 450 soldiers (or more with design modifications.) The ships are equipped with a 69-bed hospital, and are capable of serving as part of a NATO Response Force, or with United Nations or European Union peace-keeping forces. Design elements could include rapid alteration to provide offshore disaster relief when so deployed.



MQ-1 predator unmanned aircraft. Courtesy of Wiki Commons,
https://commons.wikimedia.org/wiki/File:MQ-1_Predator_unmanned_aircraft.jpg

At least two such ships should be stationed on the East Coast since most, if not all the likely locations of intercene wars or Failed States in which Canada could have a meaningful presence and role, could be in Africa or South America. Co-location of the ships would also facilitate maintenance, training and added support if required. It is suggested that for logistical and political reasons the Far East would just be too far for large scale Canadian involvement. However, a third support ship could be stationed on the Pacific coast largely for regional disaster response and/or operational support for a deployment to the west coast of the USA, Central or South America.

The RCAF would retain responsibility for the transport of the RRB troops to the general conflict area, deployment either at an airport or by parachute, when necessary. Dropped with the RRB would be appropriate drone capability to provide immediate reconnaissance and limited combat air cover. Their dedicated RCN support/supply ship that should already be on the way or on location near the crisis area or Failed State. On board ship, the RCAF would be responsible for the attack helicopters and such other air support (e.g., medivac, resupply) needed in the operation. Last, but far from least, the RCAF would transport the troops out and back to Canada upon the completion of the mission, with the RCN supply/support ship providing appropriate support.

The RCN would be in charge of crewing the support vessels and provide such other naval support as required.

Unlike the US Marine Corps, the RRB's would not be a fourth separate service. The core of the units would be army with dedicated attached elements from the RCN and RCAF to provide their operational

services. Command of the RRB's would be joint, rotational by service and operational by deployment role.

The authors were advised directly by senior personnel of one allied nation that such a rapid response capability would be welcomed and appreciated by our allies. It would also make Canada a more helpful and capable player, yet ideologically inoffensive, among the top nations in the world. Such a capability could be a major factor in fostering a peaceful conflict resolution, and response to natural disasters. In summary, implementation of this recommendation for an integrated operational approach to the CAF would put a truly sharp edge to the Canadian Defence Policy as outlined earlier in the Section “what do we do” and the new CAF mandate. Costing of such an approach must be considered within defence budget commitments and expectations that Canada increase defence appropriations to approximate its NATO commitment. Based on a non-wartime environment the authors perceive that a decade will be needed to implement such an approach.

DEVELOPING THE NECESSARY LEADERSHIP:

THE REINSTITUTION OF LAND, SEA AND AIR CADRES AT CANADIAN UNIVERSITIES AND COLLEGES

In the increasingly technologically and culturally complex environment of today, well-trained character is critically important. The Canadian Officers Training Corps (COTC) ended abruptly in 1968—contemporaneously with CF unification. There is still in the minds of many, a need for university-based CF units. This has led to a major shortage of candidates for officer training, especially for the Reserves. Such a training system exists in the United States as well as other allied nations.

It is envisioned by restoration proponents that a renewed COTC would be similar to its predecessor, i.e. strictly voluntary without any post-graduation commitment unless the full educational costs were paid by the military. However, the writers suggest consideration of the re-establishment of an innovative campus-based “Reserve Officers Training Plan” (“ROTP”) at designated universities in specific disciplines, whereby a significant portion of the students’ tuition, books, accommodation and equipment required for scholastic endeavours plus a monthly stipend be provided. The qualification for ROTP acceptance should be stringent and the commitment to the CAF, in the optimum, could be for eight years. Including the years spent in undergraduate studies.



Recent graduates of the Royal Military College in Kingston.
Courtesy of Wiki Commons,
https://upload.wikimedia.org/wikipedia/commons/b/b6/RMC-D_graduation_parade_24_June_2008.jpg

This programme would ensure a pool of highly educated, highly trained officers of multi-lingual, multi-cultural backgrounds and diverse academic disciplines, which would operate to the mutual and several benefits of the student (Officer Cadet), the CAF and the nation. It would also provide an attractive

alternative for students to help finance their university studies. Over time, it would help rebuild actual understanding of military concepts and experience within the general population.

A similar programme could be developed for community colleges and technical schools to promote skilled trades training in the NCO and specialist ranks.

Consideration should be given also to specialized technical training programs at community colleges for senior enlisted ranks. As well, considerations should be given to differential availability for training of potential Reserve personnel in urban and rural areas. Rural youth whilst generally physically capable of military performance tend to lack easy access to higher education facilities, thereby limiting their potential for officer development. Conversely, urban youth may not have the orientation towards field exercises, and have limited availability for the added time commitment military training requires. Recruitment and training programs may require enhanced flexibility to attract contemporary youth in differentiated urban and rural settings.

Dr. Jack Granatstein, a professor emeritus of history at York University and senior fellow at the Canadian Defence and Foreign Affairs Institute, has stated that the "COTC cancellation had a disastrous effect upon Canada". Dr. Granatstein further adds "the beauty of the COTC "was that it demonstrated to those in university that the military was not brutal, that there were good people serving in it and that the training provided was beneficial". In Granatstein's view, this breach between the country's leaders and the armed forces (as regrettably shown by the COTC's cancellation), led the military into a fight for its life, seeking to survive amid funding cuts as its base of support declined. It is to be noted that there is an 'experimental' Civil Military Leadership Pilot Initiative program at the Universities of Alberta and Calgary in which students can participate in paid military training during the academic year and as optional summer employment, without a requirement to formally continue in the CAF upon completion of the programme. One value of the programme to the military is seen to be the training and orientation of students to military skills and culture such that it will foster greater understanding, appreciation and support of the military community in the civilian community even if it does not lead directly to additional recruitment. In addition to some income, the value to the student is the team building, orienteering and outdoor experiences not otherwise accessible.

FORCE MULTIPLICATION – CANADIAN RESERVES AND THE READY RESERVE

The authors recommend that Regular and Reserve units (in the RCN and RCAF as well) be co-identified to build cohesiveness and that Reserve members can be given specific *specialized* ongoing roles in the Regular Force organization which build upon the members' civilian expertise. For example, the need for cyber security expertise could be provided in part by Reserve personnel utilizing their specialized civilian cyber skills on an assigned part-time basis. Such roles could include computer operations, cyber security, electronic communications, remote controlled drone operations, vehicle maintenance, some medical roles, food services, civil military relations, community intelligence and linguistic specialization to name a few.

There exists in Canada today a further military resource which is not being used well. It has relevant experience; its members have appropriate dedication; and although its numbers are not great, it could in times of exigencies make a valued contribution. These are the men and women of the CAF and other armed forces, who are past legal retirement age, but whose physical capabilities and mental faculties could still be useful in specific fields such as medicine, engineering, mechanical repair, warehouse

management, heavy equipment operations, relations with civilian authorities, and teaching of specific subjects. Each volunteer releases a younger person for more active duty. In this age of better health care, increased longevity, and laws against age discrimination, does it not make sense to utilize such resources, even on a limited basis?

FOREIGN POLICY AND FINANCIAL CONSIDERATIONS

With the election of American President Trump, increasing fragmentation and political pressures in Europe, ongoing strife in the Middle East and the ascendancy of China, the political and economic world landscape has significantly changed and new challenges will arise.

It appears that the U.S. is going back to the Monroe Doctrine and an "America First" mentality. Major U.S.A. treaties and agreements are under review, especially NATO and NAFTA, and the TPP has been cancelled. The U.S.A. is re-examining its international policies and how it will play its role as a major nation state in the increasingly multi-polar world.

Coincidentally, several of Canada's western allies are experiencing political and cultural shifts which may affect alliances. Brexit, if it occurs, could be followed by a Grexit (Greece) or Itexit (Italy) depending upon the electoral results of national votes scheduled this year. Nexit (the Netherlands) and Frexit (France) appear off the table for now. Severe economic situations are developing in Ireland, Spain, Italy and Greece which could strain international finance as well as each nation's domestic economy. Hungary, Poland and the Czech Republic are at odds with their EU associates in a number of critical matters. In effect, the component nations of the key Western alliance, NATO, are experiencing stress which may adversely affect the alliance itself. At the same time, NATO members are experiencing increased anxiety arising from a more aggressive Russian international posture.

Canada has not formally reviewed its foreign policy for many years. It would therefore seem highly desirable to do so at this time. Foreign policy, especially including our trade and defence policies as they relate and intertwine with U.S. considerations, will be of the greatest importance. Unless Canada is prepared to try to build walls contra the U.S.A. due to differences in policy approaches, it must re-examine how to work with its largest neighbor, major trading partner and continental ally under the challenges of a new U.S. regime.

Canada has a fairly strong negotiating position if it is willing to use it. Our trade with the United States is about evenly balanced with Canada's exports of \$245.6 billion or a negligible import difference of \$9.2 billion or 3.6% (StatsCan, 2016). Under NAFTA, U.S. companies are given commercial rights not available to other countries.

Furthermore, much of the value of the Canadian exports in the automotive and energy industries to the United States, for example, are by American owned companies operating in Canada. The United States benefits in both economic and security terms from dependable supplies of lower priced Canadian heavy oil. In competitive terms, our minimum wages are at about \$14.00 CAD versus a U.S. rate of about \$8.00 USD with six States having no minimum rates. And the Canadian dollar enjoys a substantial and variable discount to the USD (currently in the range of 30%). The United States also benefits from a net surplus of Canadian visitors spending of almost \$11 Billion per annum for an overall small current account surplus of about \$800 million in favour of the United States.



Eurofighter Typhoon. Courtesy of Wiki Commons,
https://commons.wikimedia.org/wiki/File:Eurofighter_Typhoon_w_Zeltweg_2011.jpg

Canadian military expenditures are a different matter. Military expenditures as a percentage of Gross National Product (GDP) were agreed among the NATO countries to be 2% of GDP.

The overall NATO average is 1.5% with Canada at a low of 0.9% of GDP or \$15 billion.

The US has paid the lion's share of NATO costs in the past and is now stating that other members must live up to their commitments. Canada has now committed to reach a defence spend equal to 1.4% of GDP within the next few years

as well as to increase its capital spend

well beyond the NATO target of 2%. It would not be inconceivable to assume that as a minimum the US would insist that Canada increase its share to 1.5% to 1.75% of GDP or an increase of up to \$10 billion to \$14 billion to a total budget of \$25 to \$29 billion annually, still short of the NATO commitment but in keeping with the current NATO average.

It is fully understood, especially in an era of deficit financing, that such an increase may prove politically difficult. Such an endeavor needs to be done in full consultation and joint action by other NATO partners. Likely such a programme could result not only in new arrangements in defence with the United States but also with changes to Canada's procurement policies as well.

These procurement needs provide potent economic arguments that should be an integral part of any NAFTA renegotiations. Canada does not have to buy its equipment from the United States nor ship its oil exclusively to the USA especially with the recent approval of the Kinder-Morgan and Trans-Mountain pipelines. Other countries make excellent equipment compatible with US equipment including several in Europe. Canada recently demonstrated its willingness to diversify procurement with the purchase of European

made coastal patrol planes as it did in the past with acquisition of German Leopard tanks. Current considerations about continuing in the F35 development programme and the planned 'open competition' for the replacement of the CF 18 fleet could include consideration of the reasonably competitive



French Dassault Rafale fighter. Courtesy of Wiki Commons,

https://www.google.ca/search?q=dassault+rafale&espv=2&site=webhp&source=lnms&tbm=isch&sa=X&sqi=2&ved=0ahUKEwjn-5jd2bDTAhVKw1QKHV86BHgQ_AUIBygC&biw=1600&bih=721#q=dassault+rafale&tbm=isch&tbs=sur:fc&imgc=DJ__uiZiYT740MM:

Eurofighter or other platforms. (Perhaps not to be ruled out for negotiating purposes might be the lower cost French Rafale or the Eurofighter, Swedish Super JAS, or even the Japanese F3 multi-role fighters as well). This competitive assessment would place the American defence industry squarely in Canada's corner. That, with the support of 35 American States to whom Canada is their major export market, plus XL oil pipeline which President Trump has approved, should give Canada some additional cards in its negotiating hand regarding NAFTA as well as pricing of any US aircraft to replace Canada's aging CF 188 fighters or even the proposed Super Hornet acquisition.



Mitsubishi F-3 Fighter. Courtesy of Military Today, www.military-today.com/aircraft/mitsubishi_f3.htm



Swedish Saab JAS-39 Fighter. Courtesy of Wiki Commons, http://commons.wikimedia.org/wiki/File:Saab-JAS-39_at_ILA_2010_05.jpg

We return, however, to the main observations and recommendations of this commentary. Even though a detailed financial analysis is beyond capabilities of the writers, the costs of the proposed increases in Canadian military expenditures to meet NATO commitments can be expected to cover most or all of the foregoing recommendations in respect of the Canadian Navy, the Canadian Army and the Royal Canadian Air Force. Detailed financial analysis of these proposals is beyond the capability of the authors. Nonetheless, some general observations can be made. If the Government wishes to have a credible military to support its commitment to NATO and meet American continental expectations/commitments, as well as to have effectively trained troops for the realities of modern international roles including peacekeeping in a contemporary

environment, some of those with whom the authors spoke suggested that the government could act on:

1. Reducing the overweighed defence bureaucracy;
2. Redefining an effective relationship and role for the Reserves, Ready Reserve and Rangers;
3. Ensuring that military personnel are supplied and trained with the appropriate equipment, including rapid technological upgrades, to do the proposed/required job;
4. Procuring equipment on time and available when needed;
5. Procuring equipment in a direct cost-effective manner, not in a manner to meet primarily other non-military (regional development) objectives;
6. Insuring that the three main services are tasked, led and trained in an integrated manner to support each other to enhance effective deployments;
7. Gaining an effective appreciation by political leadership of both the Government and the Official Opposition of the realities of modern conflicts and the potential alternatives for resolution thereof;
8. Taking a bipartisan, long term approach to defence policy development; and

9. Funding raised to the actual level of international commitments and above, if needed to ensure Canada's volunteer military is responsibly supported.

It is reassuring to see that the government has recognized many of these considerations in its newly announced Defence Policy.

What perhaps also should be considered is a major "Financial Effectiveness Audit" of the entire Canadian military expenditure. That audit should include experts from those countries such as Australia and Norway or others considered to be some of the best. Based on the Australian experiences and discussions with knowledgeable personnel, perhaps as much as 15-20% of all military expenditures will be found inefficient and/or ineffective, and could likely be reduced.

Thus, in conclusion, the many future threats and U.S. pressures, to which the CAF may have to respond, will clearly require more funding. Additional funds might also be realized by judicious pruning of unnecessary bureaucracy, dated programmes and more effective cost controls. Alternative financing models such as leasing might also be considered in the light of imaginative financing solutions presently employed by such countries as the United Kingdom. Canada must avoid untried and un-proven design of un-well tested models of equipment with the exception of demonstrably useful AI developments. Off-the-shelf items or fully refurbished previously used equipment can be much less expensive with much quicker delivery dates and carry much less risk of capital cost overruns. Canada would be much better advised to trade products like Canadian made LAVs, for specialized ships, MRAP vehicles or other equipment required.

Conversely, Canada might actually develop a specialized defence industry to capitalize on Canadian skills and capabilities and our own procurement programmes in collaboration with other countries when beneficial. Canada has an export programme for its domestically made light armoured vehicles, but has Canada aggressively considered enhancing its naval combat shipbuilding industry from that of a regional economic development subsidization programme to a world class competitor? Germany, does it with diesel electric submarines, Finland with patrol boats and South Korea with container ships. Are there other potential buyers for Canadian made coastal patrol vessels?

In essence, Canada's new forward-looking defence policy needs to continuously look at what responsible and effective role that a midsized 'western' multi-cultural democracy can be reasonably expected to play in defence and security of its own population and national/geographic interests, and in its contribution as a successful nation state into a world that appears to be increasingly tribalized and conflicted.

In conclusion, it is sincerely hoped this commentary will assist in some small measure the Government of Canada to make our country stronger in its institutions, especially in its foreign affairs, supported by a CAF that will continue to be a formidable military participant that often "punched above its weight" making every Canadian feel proud and secure. Canada's all volunteer military deserves nothing less than consistent meaningful support.

FUNDAMENTAL QUESTIONS:

To be understood and supported by both its citizens as a whole and the members of its military in particular, a defence policy of any government needs to address two underlying questions. First, what is the *intent* of the government for its military and its use? Second, what then is the needed *capability* to fulfill that intent? From response to these questions flow policies, programs and practices relating to:

- Appropriate force structure, composition, command, leadership and inter-unit operation;
- needed personnel selection, training, development, assignment, unit leadership and cohesion and evaluation;
- Clear and reasonable tasking and deployments;
- Timely equipment selection, procurement, availability and utilization;
- Reasonable and appropriate participation with allied militaries;
- Timely, appropriate and sustained resource commitment.

With these and likely other considerations well addressed, a country and its citizens, and its military members, can have enhanced confidence. Most any military has some *capability*; the real issue is how well that capability meets often changing government *intent*?

*If ye break faith with us who die
We shall not sleep, though poppies grow
In Flanders fields.*

APPENDIX A: Abbreviations

AI	Artificial Intelligence
ASROC	Anti-Submarine Rocket
AWAC	Airborne Warning and Control System
CA	Canadian Army
CAF	Canadian Armed Forces
CBSA	Canadian Border Services Agency
CFD	Canadian First Defense Policy
CME	Coronal Mass Ejection
CCG	Canadian Coast Guard
DART	Disaster Assistance Response Team
EMP	Electronic Magnetic Pulse
GDP	Gross Domestic Product
IFF	Identification Friend or Foe
JTF2	Joint Task Force
MISTRAL	Smaller French Assault War Ship
NATO	North Atlantic Treaty Organization
NORAD	North American Defence Command
NSPS	National Shipbuilding Procurement Strategy
PTSD	Post-Traumatic Stress Disorder
RCAF	Royal Canadian Air Force
RCN	Royal Canadian Navy
RFP	Request For Proposal
ROE	Rules of Engagement
ROTP	Reserve Officers Training Programme
RRB	Rapid Response Brigade
SOP	Standard Operating Procedure
<u>AIRPLANES</u>	
Boeing C17	Globe Master Large Transport – cost \$200 million+ USD
C130	Lockheed C-130 Large Transport Plane \$20-30 million USD
C245	New Coastal Patrol Aircraft – already acquired
Super Hornet	Boeing made Multi-Role Fighter – Cost \$61 million USD
F35	Lockheed Martin – single engine stealth fighter – Cost estimated at \$85-\$111 million USD each

APPENDIX B: List of Countries by Military Expenditures 2016 Fact Sheet

Rank	Country	Spending (\$Bn)	% of GDP
	World Total	1,676.0	2.3
1	USA	596.0	3.3
2	China	215.0	1.9
3	Saudi Arabia	87.2	13.7
4	Russia	66.4	5.4
5	U.K.	55.5	2.0
6	India	51.3	2.3
7	France	50.9	2.1
8	Japan	43.6	1.4
9	Germany	39.4	1.2
10	South Korea	36.4	2.6
11	Brazil	24.6	1.4
12	Italy	23.8	1.3
13	Australia	23.6	1.9
14	UAE	22.8	5.7
15	Israel	16.1	5.4
	Canada Today	15.0	0.9
	New Defence Policy Proposal	23-24.0	1.4
	As proposed herein (a)	25.0	1.5
	As proposed herein (b)	27.5	1.65

Note: The above suggested increases in either (a) or (b) would make Canada #11. *Source: Wikipedia*

APPENDIX C: Article about the US Army

Battle For Army's Soul Resumes: Lessons From Army After Next
By Bob Scales on March 28, 2017

Today, the Army is exploring a new concept of future combat called Multi Domain Battle, which calls for small, agile units designed to overwhelm the enemy with coordinated actions not only on the land, but in the air, on the sea, and in space, cyberspace and the electromagnetic spectrum.

Putin's Little Green Men mirror our ideas with remarkable fidelity. In the Crimea, Ukraine and Syria Russia put in the field interdependent, information-enabled, dismounted small units built around a fighting elite composed of GRU Spetsnaz, Naval Infantry, and other Special Forces. The Russians employ electronic warfare, information operations, drones and disinformation in a remarkably creative, capable and cost-effective manner. An AAN [Army After Next]-like approach to tactical warfare allows Putin to match limited tactical actions to a similarly limited strategic end, with very little loss of Russian life.

The third player is the **Marine Corps**. In 2003, I wrote *Yellow Smoke*. At the time it was a compendium of all my thoughts about AAN. It had an immediate impact within the Corps. A succession of senior Marine leaders, from Mike Hagee to James Mattis and now Robert Neller, have studied and successfully applied many of the lessons of the book in combat and in subsequent field experiments. The Marines continue their interest in an AAN-like force as evidenced by their recent adoption of several new ideas contained in my follow-on book, *Scales on War*. Their success applying tenets of AAN are too numerous to recount here. Suffice it to say that the soul of AAN may have started out in the Post-Cold War Army, but it resides today in the Marine Corps. The Army is increasingly aware that wars will continue to consist of interdependent layers of complexity that demand new approaches.

From BREAKING DEFENSE March 29 2017

APPENDIX D: Russian Arctic Update

THE NEW COLD WAR

Inside Russia's top-secret Arctic base which Vladimir Putin has filled with nuclear-armed warplanes and REINDEER-riding Special Forces

Article originally appeared in The Sun on April 18th, 2017

<https://www.thesun.co.uk/news/3352600/russia-arctic-base-vladimir-putin-nuclear-weapons-special-forces/>

VLADIMIR Putin has his eyes set on starting a new Cold War – by opening a top-secret military base in the Arctic.

The giant complex on the northern ice cap is believed to be fully-armed with missile systems and nuclear-ready fighter jets.



Russia has unveiled its new military base in the Arctic.

Vladimir Putin had overseen plans for the massive complex on Alexandra Land.



It is part of a drive to take advantage of trillions of pounds worth of natural resources Moscow believes is buried beneath the snow.

And Russian economists reckon it could hold the key to the Kremlin unearthing almost £24 TRILLION [\$40.7 Trillion CAD] of oil and gas buried deep beneath the snow. The Times reports.

Moscow yesterday released the first pictures of the giant Arctic Trefoil complex on the Arctic island of Alexandra Land - where temperature can drop to -50°C .

More than 150 troops will be based at the clover-shaped compound - which is decked out in the red, white and blue of the Russian flag.

And more worryingly, Moscow's defence minister Sergei Shoigu confirmed nuke-ready Su-34 fighter jets will be deployed at a nearby air base.

Those inhabiting the base will have to contend with the threat of killer temperatures and ravenous polar bears that live nearby.

More troops are on their way, too.

Putin has ordered elite Special Forces troops to train up for Arctic warfare - using REINDEER SLEDS for transport in the freezing conditions.



The base will initially be home to around 150 elite soldiers.



Moscow has ordered that the country's elite special forces are trained in the art of reindeer-riding as they prepare a move to the base.



Putin's plans for the Arctic have been met with opposition in the US. Nuclear-ready Su-34 fighter jets will also be stationed at the base.

Russia unveiled the five-storey complex yesterday.

The move comes shortly after the US expressed its concern over Russia building up its military near the North Pole.



Washington's Defence Secretary James Mattis said: "Russia is taking aggressive steps to increase its presence there."



INSIGNIA

RANK & APPOINTMENT



NAVY	ARMY	AIR FORCE
FLAG OFFICERS	GENERAL OFFICERS	GENERAL OFFICERS
Admiral (Adm) Vice-Admiral (VAdm) Rear-Admiral (RAdm) Commodore (Comdr)	General (Gen) Lieutenant-General (LtGen) Major-General (MGen) Brigadier-General (BrGen) General Officer's Baret (GOB)	General (Gen) Lieutenant-General (LtGen) Major-General (MGen) Brigadier-General (BrGen)
SENIOR OFFICERS	SENIOR OFFICERS	SENIOR OFFICERS
Captain (Capt) Commander (Com) Lieutenant-Commander (LtCom)	Colonel (Col) Lieutenant-Colonel (LtCol) Major (Maj) Colonel's Baret (COB)	Colonel (Col) Lieutenant-Colonel (LtCol) Major (Maj)
JUNIOR OFFICERS	JUNIOR OFFICERS	JUNIOR OFFICERS
Lieutenant (LtJr) Sub-Lieutenant (SLt) Acting Sub-Lieutenant (ASLt)	Captain (Capt) Lieutenant (Lt) 2nd Lieutenant (2Lt)	Captain (Capt) Lieutenant (Lt) 2nd Lieutenant (2Lt)
SUBORDINATE OFFICERS	SUBORDINATE OFFICERS	SUBORDINATE OFFICERS
Naval Cadet (NOC)	Officer Cadet (OC)	Officer Cadet (OC)
SENIOR APPOINTMENTS	SENIOR APPOINTMENTS	SENIOR APPOINTMENTS
Canadian Forces Chief Warrant Officer (CFCWO) Command, Chief Petty Officer (COP) Command, Group, Formation, Fleet, Base Chief Petty Officer (CGP)	Canadian Forces Chief Warrant Officer (CFCWO) Command, Chief Warrant Officer (CWO) Command, Group, or Formation, Chief Warrant Officer (CGWO)	Canadian Forces Chief Warrant Officer (CFCWO) Command, Chief Warrant Officer (CWO) Command, Group, Formation, Wing Chief Warrant Officer (CGWO)
NON-COMMISSIONED MEMBERS	NON-COMMISSIONED MEMBERS	NON-COMMISSIONED MEMBERS
Chief Petty Officer 1st Class (CPO 1) Chief Petty Officer 2nd Class (CPO 2) Petty Officer 1st Class (PO 1)	Chief Warrant Officer (CWO) Master Warrant Officer (MWO) Warrant Officer (WO)	Chief Warrant Officer (CWO) Master Warrant Officer (MWO) Warrant Officer (WO)
Petty Officer 2nd Class (PO 2) Master Gunner (MG) Leading Seaman (LS) Able Seaman (AS) Ordinary Seaman (OS)	Sergeant (SGT) Master Corporal (MCpl) Corporal (Cpl) Private (Trade) (Pte T) Private (Basic) (Pte B)	Sergeant (SGT) Master Corporal (MCpl) Corporal (Cpl) Aviator (Trained) (Av T) Aviator (Basic) (Av B)

Salute Canada's volunteer military personnel