



National
Defence

Défense
nationale



Air Force Vectors

Agile
Integrated
Reach
Power



Canada

Air Force Vectors

Director General Air Force Development

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List of Amendments

Subsequent to the initial issue of *Air Force Vectors* (AFV) all changes to the document will be made to the electronic version available on the Directorate of Air Strategic Plans (intranet website). The following table identifies the current version in use.

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Foreword

An agile and integrated air force with the reach and power essential for CAF operations.

In flight, an aircraft has a physical vector dependent solely on the flight path chosen by the pilot. The same aircraft can be given a vector in order to manage airspace use, guide it toward a specific target, or even provide an initial “steer” until such time as the crew is able to navigate independently. As a strategic tool, the vector concept is used in much the same manner to guide and steer the Air Force towards the commander’s vision and to manage the institutional flight path in order to enable a unity of effort and cohesion. *Air Force Vectors* (AFV) contains the broad guidance necessary to illuminate and target what the future Air Force will look like—the core capabilities, roles, and attributes the Royal Canadian Air Force (RCAF) and its personnel will need to meet tomorrow’s challenges, while recognizing the need to nurture the ethics, values, and professionalism that have earned us the confidence of our fellow Canadians and that of our allies.

Ongoing strategy development, planning, and auditing are essential if the RCAF is to contribute to joint force development (FD), and ultimately, the nation’s future generation of airpower users. This document is a part of a wider Air Force strategy toolset that “lead turns” FD by identifying the enduring challenges for Canadian airpower as well as the vectors needed to guide the transformation of the institution. While *Air Force Vectors* provides a stable foundation for what the RCAF is, it works in concert with a body of strategic guidance documents, including the *Canada First Defence Strategy* (CFDS), the *Chief of the Defence Staff Guidance to the Canadian Armed Forces*, the *Future Concepts Directive* (FCD) and the *Campaign Plan* (CP), through which my specific intents and directions to meet the needs of AFV will be provided. Collectively we will institutionalize this emerging strategic framework for the RCAF to provide the requisite input to the Canadian Armed Forces (CAF) FD community, to direct effort across the Air Force and to develop the agility to meet tomorrow’s transformation challenges. Institutional agility will become even more important as we adapt to changes to the CAF force structure and organization as well as possible resource constraints, all in the face of an uncertain future. We will not stop trying to reduce that uncertainty, but agile people, force structures, and organizations can ensure that we can deliver airpower when and where needed by the CAF and the Government of Canada (GC).

The Royal Canadian Air Force title was reinstated on 16 August 2011, confirming the importance of our history and heritage in understanding our present and the future. This work builds on that past and looks to the future.

Yvan J. Blondin
Lieutenant-General
Commander RCAF

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Executive Summary

Air Force Vectors (AFV) builds on the analysis and objectives provided in previous strategic guidance—*Strategic Vectors*, the *Aerospace Capability Framework*, and *Air Force Strategy*—and represents one element of the Royal Canadian Air Force's (RCAF's) suite of strategic planning and management tools. The Air Force's¹ fundamental role is to generate airpower and airpower expertise for the Canadian Armed Forces (CAF) to meet the ends articulated by the Government of Canada (GC) and its current defence policy, the *Canada First Defence Strategy* (CFDS). The commander's ability to generate airpower is wholly vested in the people, expertise, governance, and processes as well as the analysis, debate, and discussion that drive change and innovation. *Air Force Vectors* is one of the tools being introduced to steer the Air Force as an institution, articulating the context, ends and ways by which the Commander Royal Canadian Air Force (Comd RCAF) will generate airpower and airpower expertise. The other tools will provide a continuum of planning capability to guide Air Force transformation over the coming years.

Chapter 1 of AFV outlines the emerging strategic guidance framework for the Air Force, which we will continue to optimize over the coming months. This staff planning effort will be ongoing for the next two years as we seek to provide further discipline to the Air Force key functions, streamline processes, and focus on those elements crucial for the delivery of airpower.

Chapter 2 provides a summary of defence challenges, enduring as well as those possible in the future, measured against GC and departmental defence and security policy and strategy, and distilled into relevant deductions for airpower. This model will be institutionalized, and direction will be provided for formal programmes of strategic analysis,

technology tracking, research and development (R&D), and concept development and experimentation (CD&E)—the start point of which is analysis undertaken by Chief of Force Development (CFD), and the Canadian Forces Aerospace Warfare Centre (CFAWC)—and presented in the *Future Concepts Directive* (FCD). As the FCD is still under development, the initial analysis has been undertaken in Chapter 2 of this document.

Chapter 3 identifies the RCAF's contemporary mission and those core airpower capabilities and roles that must be executed to achieve it. Identifying the airpower roles is necessary to permit us to determine the RCAF's fundamental airpower outputs, supported by the institutional core processes that permit force generation (FG) and joint force development (FD) to ensure our airmen² excel at the delivery and execution of Canadian airpower. When further assessed against those attributes unique to the employment of Canadian airpower, we arrive at Canadian airpower requirements—those airpower demands that illustrate the fundamental need for the Air Force as a national instrument of military power.

Chapter 4 presents the commander's vision—*an agile and integrated air force with the reach and power essential for CAF operations*—and describes the flight plan to enable the development of the future force. In this vision statement will be found the genesis of the RCAF's four vectors, and the critical characteristics of each. In order to drive transformation, each vector derives strategic objectives that shape analysis of capability gaps for the *RCAF Campaign Plan* (CP).

The *RCAF CP* will help identify capability gaps that impair our ability to achieve the mission and to develop means to mitigate the risks of those gaps. It will also help execute the master implementation plans (MIP) as we transition to new capabilities

1 The abbreviation "RCAF" and the term "Air Force" are used interchangeably, and are one and the same thing.

2 We use this Department of National Defence (DND) / CAF approved term to refer to the collective of Air Force personnel, where RCAF personnel refers to civilian and military working for/with the RCAF.

and platforms. The CP will be aligned along the core processes and responsibilities outlined in Chapter 3 of AFV. The CP will be the key operational level execution document for the RCAF, and contingency operational requirements will be executed under the CP through a hierarchy of operations orders and/or fragmentary orders.

The final key in the emerging model will be the ability to evaluate our performance to ensure that our efforts to deliver airpower are meeting readiness targets today and that we are hitting the transformation targets articulated in the strategic objectives and by the Chief of the Defence Staff (CDS).

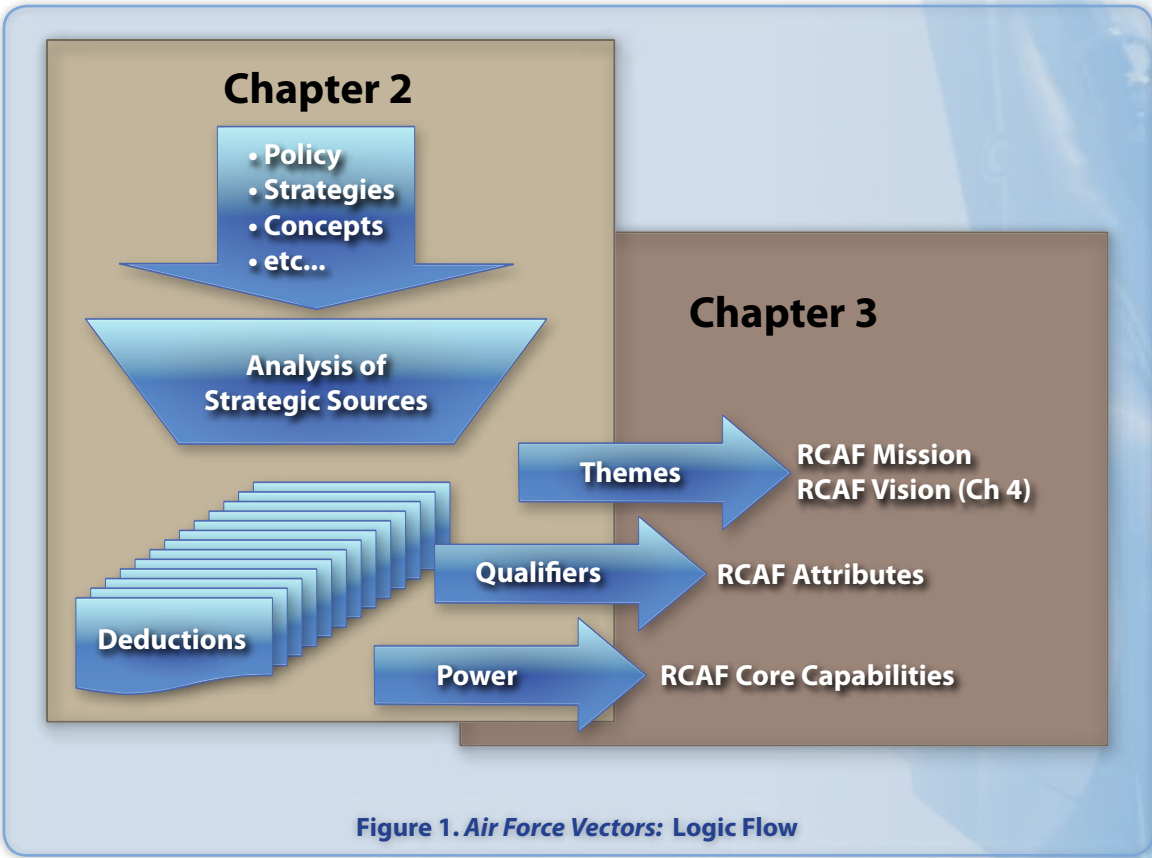


Figure 1. Air Force Vectors: Logic Flow

The RCAF mission:

The RCAF will provide the CAF with relevant, responsive and effective airpower to meet the defence challenges of today and into the future.

The RCAF vision:

An agile and integrated air force with the reach and power essential for CAF operations.

Chapter 1

Introduction

Strategic Guidance Framework Overview

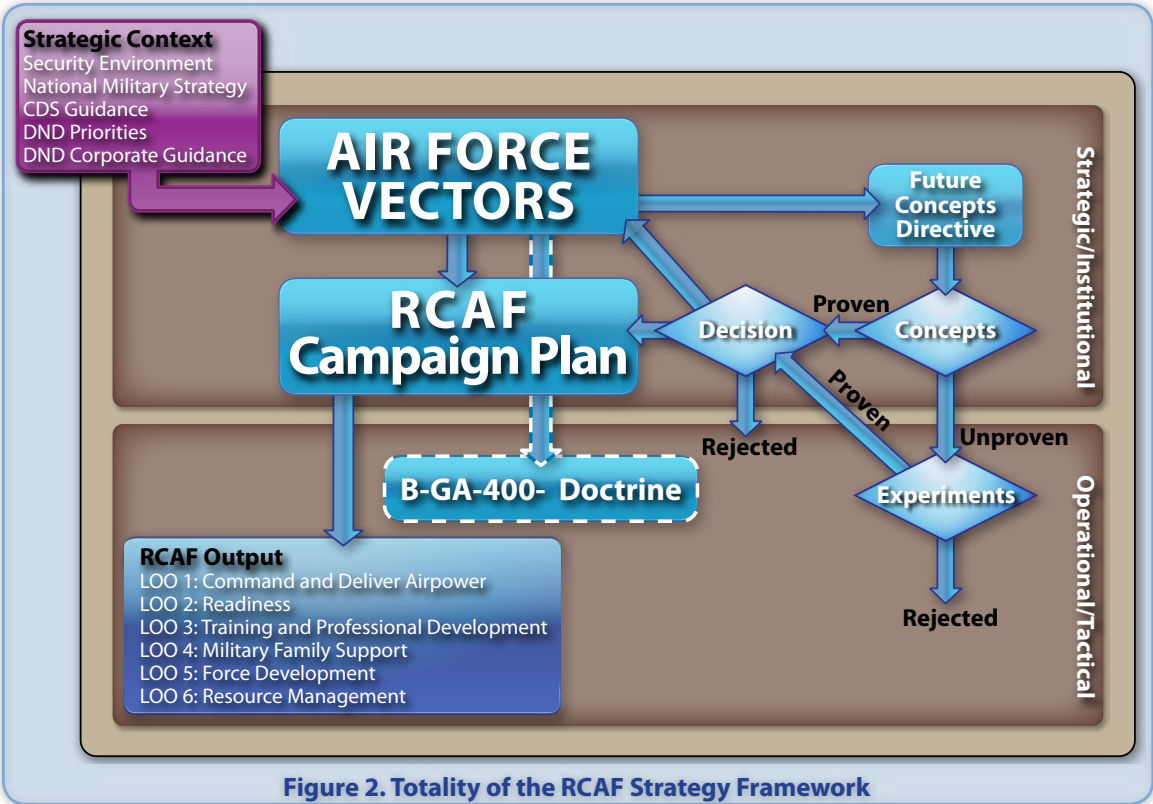
For several years, we have benefitted from the existence of the draft *Air Force Strategy*, and its predecessor *Strategic Vectors*, both of which articulated a vision for the Royal Canadian Air Force (RCAF) and explained the role of airpower to the defence community. The companion pieces, the *Aerospace Capability Framework* and *Campaign Plan (CP)*, informed capability development and management. As the force development (FD) process and Canadian Armed Forces (CAF) structures continue to evolve, it is essential for the RCAF to adopt a comprehensive strategic guidance framework enabling us to sustain the required airpower output for today and to identify and develop that needed for tomorrow.

Future FD is not an exact science. The objective of the RCAF's new strategic guidance framework is to deliver an agile and adaptable Air Force that is not only responsive to CAF requirements and the commander's intent but it is also an organization that develops airpower—and airpower expertise—to meet known as well as a range of possible needs. The development of the new strategic guidance framework does not occur in a vacuum.

The RCAF strategic guidance, analysis, and plans are aligned with Government of Canada (GC), Department of National Defence (DND), and CAF policy, strategy, and analysis, including the *Chief of the Defence Staff Guidance to the Canadian Armed Forces*.

Underpinned by directed analysis and a more robust governance and management system, decisions on the consequent airpower roles and organizational changes are communicated in *Air Force Vectors (AFV)*, which in turn drives the lines of operation in the *RCAF CP*. The main products are described in more detail below, and their relationship depicted in Figure 2.

The analysis and deductions presented within *AFV* are meant to serve both an external and internal audience for the purpose of informing debate on contemporary Canadian airpower and the supporting doctrine needed to employ it. Stipulating core airpower capabilities is of little military value without a robust doctrine framework enabling the delivery of airpower effects; the B-GA-400 series of Canadian Forces Aerospace doctrine manuals accomplishes this need.



Air Force Vectors. The purpose of this document is to articulate, from the commander's perspective, the defence and security challenges facing the nation and to provide the guidance needed to position the RCAF to generate the airpower and airpower expertise required by the CAF to meet these challenges. In the revised RCAF strategic framework, this document provides the commander's intent on the strategic context, ends, and ways of Air Force strategic direction.

The strategic context described in AFV is rooted in analyses of Canada's enduring defence challenges; emerging employment concepts; and strategies of the Canadian Army, the Royal Canadian Navy, special operations forces (SOF), and force employers; lessons learned through operations and training; as well as CAF and RCAF future

security and operating environment studies designed to inform a shared understanding of possible future capability requirements. These CAF future studies guide concept development and experimentation as well as assessments of CAF capability gaps when measured against current and possible missions.¹ The RCAF has used these to inform its own speculation on the nature of future operating trends and themes of specific import to the employment of airpower.

The current output of these deliberations is captured in *Projecting Power: Canada's Air Force 2035* and *Projecting Power: Alternative Futures for Canada's Air Force in 2020*. The latter is the output of an annual analysis of the medium-term (ten-year) security and operating environment provided as a check on Air Force long-term planning.

1 DND, Chief of Force Development (CFD), *Future Security Environment [FSE], 2008–2030, Part One: Current and Emerging Trends*, 27 January 2009, http://www.cfd-cdf.forces.gc.ca/documents/CFD%20FSE/Signed_Eng_FSE_10Jul09_eng.pdf (accessed March 13, 2012). The status of FSE Part Two: *Future Shocks* and Part Three: *Alternate Futures* as departmentally endorsed views of the FSE is unknown at the time of publication.

The former has been used to provide input to the CAF's future capability planning process and to inform Air Force concept development. With an appreciation of the limitations of futures prognostication, *AFV* uses future's studies sparingly in this iteration, underpinning the future challenges and airpower requirements deductions on more enduring defence and security challenges, distilled through extant policy, strategy, and endorsed concepts. The results of this analysis will be developed further in the next round of strategy development through the *Future Concepts Directive (FCD)*, the aim of which is to examine probable future air operating environments and concepts, and to determine what these might mean for CAF airpower roles and requirements.

Chapter 3 of *AFV* will then articulate the Air Force core capabilities and processes as derived from the analysis of airpower requirements summed up in the strategic context, emergent airpower concepts, attributes, current capability, and possible future requirements. In the future, the latter will be summed up in the *FCD*, but in essence this chapter provides an estimate of strategic airpower requirements for now and into the immediate future. The core capabilities and processes detailed in Chapter 3 will inform the lines of operation anticipated for the *CP*. Chapter 4 articulates the vision and vectors for the RCAF as we direct its transformation.

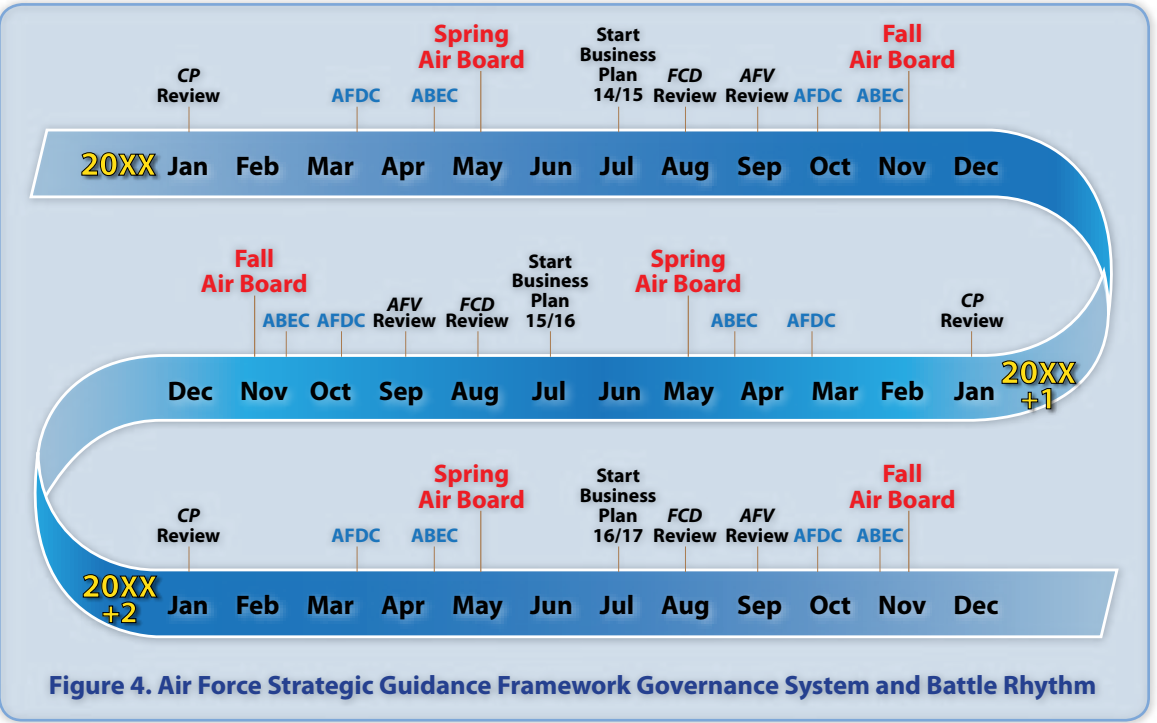
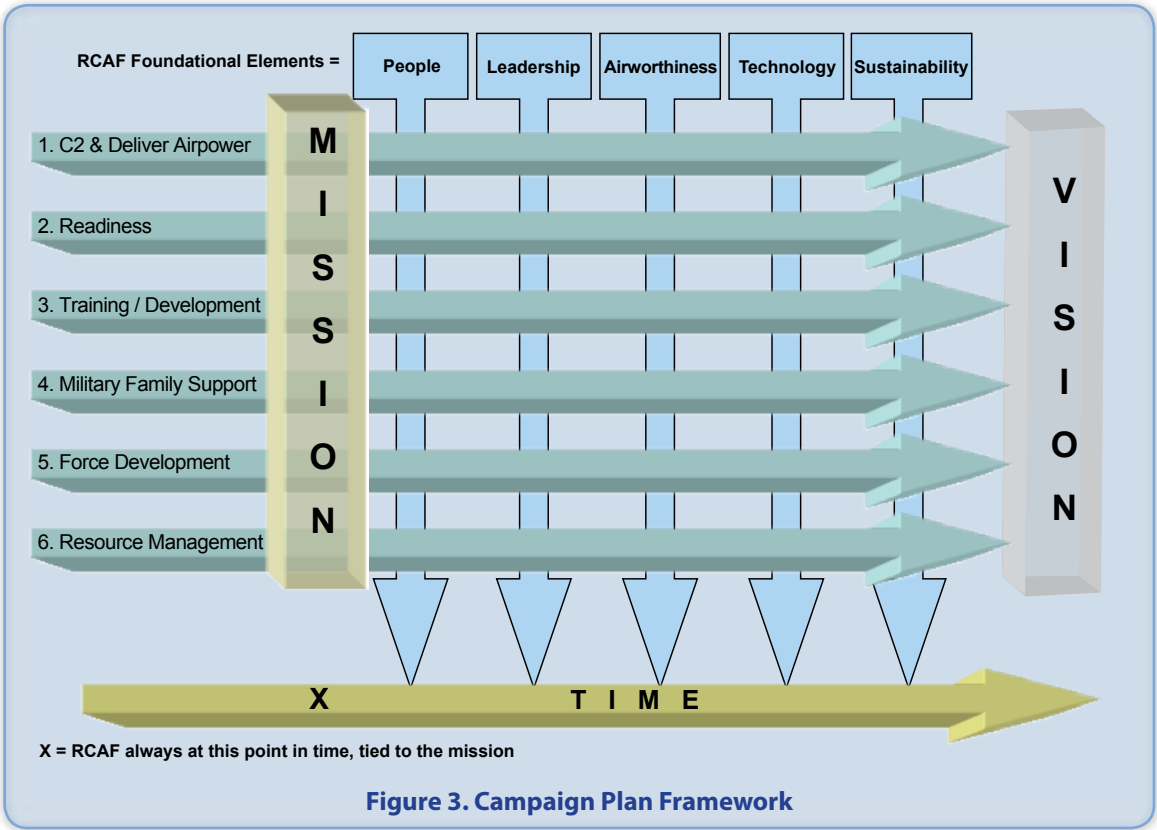
Future Concepts Directive. The RCAF is changing its emphasis on the role of futures analysis in its FD process. Acknowledging the practical limits of selecting capabilities based purely on predictive futurology, we will use ongoing analysis of enduring and emerging requirements to inform capability gap assessments and consequent concept development and experimentation. The aim of the *FCD* is three-fold: to ensure that the RCAF remains at the leading edge of airpower developments; to understand future opportunities (concepts and technologies) through the provision of unproven concepts to the experimentation process; and, to further develop any

identified proven concepts—whether from internal or external sources—as directed. The *FCD* provides the commander's direction in one area—concept development and experimentation—complementing other research and analysis required to inform FD and an understanding of future airpower requirements. Validated airpower concepts will be measured against policy, strategy, and resources to provide direction in *AFV*.

RCAF Campaign Plan. This plan, based on a five-year rolling format and refreshed regularly as required, articulates how the RCAF will deliver the airpower output for the CAF. This operational-level plan will be detailed along the lines of operation derived from the core capabilities and processes of *AFV*, Chapter 3. It will address the legacy system FD issues facing the Air Force on a daily basis and also consider the transition to investment plan capital acquisition programmes. The *CP* operationalizes the strategy articulated in *AFV* and is a key consideration when attempting to balance sustaining current capabilities and developing new ones. Figure 3 provides an illustration of the *CP* framework.

Combined, and underpinned by ongoing analysis and periodic review, this body of work will provide the hierarchy of documents and the necessary framework to support RCAF engagement within National Defence Headquarters and across the CAF and to coordinate and prioritize our collective RCAF effort. The interrelationship of these key tools is represented in Figure 2.

The aim of the new strategic guidance framework governance system and battle rhythm (Figure 4) is to institutionalize the development, production, and review of the Air Force strategic documents and processes. Although simple in concept, achieving effective change management requires ongoing review, analysis, and understanding of many strategic factors, including the political environment, departmental



budgeting programmes, and the emerging security environment, to name only a few. Further, we need to understand the emerging requirements of the other environments and the CAF force employers. A set battle rhythm will institutionalize the strategic framework when balanced with effective organizational governance, and underscores a disciplined approach to strategic design. An institutionalized battle rhythm also facilitates bottom-up input to the strategic analysis continuum.

Based on the current governance, the battle rhythm for the strategic guidance products can be summarized as follows:

- a. *Air Force Vectors* will be reviewed periodically at the discretion of the Commander Royal Canadian Air Force (Comd RCAF), with a full update conducted every five years. An electronic version will be hosted on the Internet, with course corrections based on emerging guidance provided by the RCAF, CAF, and department documents.
- b. The *FCD* facilitates ongoing analysis for the airpower FD continuum and represents an iterative process. The current goal is to have a detailed list of potential airpower concepts produced every five years, although the identification of capability gaps may require more frequent revisions.
- c. The *RCAF CP* is a five-year life cycle plan updated and/or refreshed annually. The *CP* will be managed at the strategic level, but will require input from across the RCAF.

Chapter 2

Strategic Context

I am tempted to declare dogmatically that whatever... the Armed Forces are working on now, they have got it wrong. I am also tempted to declare that it does not matter that they have got it wrong. What does matter is their capacity to get it right quickly when the moment arrives.¹

Sir Michael Howard

Introduction

The intent of this chapter is to provide a high-level overview of external factors influencing the development and delivery of Canadian airpower. It begins by examining the defence challenges that, irrespective of the current geo-political environment, continue to shape and influence Canada's defence needs. With an understanding of these enduring challenges, the variables presented by the trends in the security environment and their probable impact on defence needs are presented, noting that these requirements will be articulated more fully in the next iteration of the *Future Concepts Directive (FCD)* and validated for the next version of *Air Force Vectors (AFV)*. Through the lens of these enduring challenges and probable variables, the government's defence policy and military strategy are reviewed for their impact on probable airpower demands. Using the Chief of the Defence Staff's (CDS') vision for the Canadian Armed Forces (CAF), along with the *Chief of the Defence Staff Guidance to the Canadian*

Armed Forces, the corresponding efforts of the individual environments and force employers to meet it, further deductions are then made for the CAF's airpower needs. Identifying what challenges the Royal Canadian Air Force (RCAF) must be prepared to respond to leads to the development of our core airpower missions, core roles, and airpower capabilities, and in the next chapter (a summary of these deductions can be found in Annex A).

Enduring Defence Challenges

Canada has defence challenges that are enduring and which fundamentally influence how we view and pursue our security needs. History has shown how these challenges continue to manifest themselves in government policy and strategy; government priorities and emphases change, but the challenges remain. How these challenges

¹ Sir Michael Howard, "Military Science in the Age of Peace," *Journal of the Royal United Services Institute for Defence Studies* 119 (March 1974).

are met is shaped by emerging technology and new concepts to harness this technology constrained by economic conditions and other government priorities.

Primary amongst the enduring challenges is our geography. Canada is the second largest country in the world in terms of land area, yet has one of the lowest population densities, concentrated primarily along its southern edge. It is surrounded by three oceans—one abutting a former cold war threat—with an extensive coastline, and sharing a lengthy border with the most powerful nation on earth. The defence and security challenges of geography, and the sovereign responsibility and obligation to secure Canadian territory, are imposing. History suggests that the relative character of the defence and security challenges posed by Canada's geography can only be understood in the context of political, economic, and international relations; technology; and topography. For example, Canada's austere Northern region can be viewed as a bridge or barrier, and its relationship to defence, sovereignty, and the economy is determined primarily by will and intent and is constrained or assisted by climate and technology.

Canada's size is a defence and security challenge in and of itself. The comprehensive surveillance and control of huge swaths of unpopulated territory with a lengthy coastline and vast maritime approaches are something that can be best exercised, with any degree of persistence, from air and space. Canada's Arctic is just one region exemplifying the daunting challenge of identifying problems and responding in a timely and robust manner. Airpower, with assets strategically based and with its combination of reach and speed, is essential to overcoming the defence challenges created by Canada's geography.

Canada shares a lengthy border with the United States (US), another manifestation of our geography that provides tremendous economic benefits, but also poses security and defence challenges for Canada's military. The principle that the defence of North America is indivisible has been a central plank of Canadian defence policy since 1940.² An underlying assumption of that principle has been that Canada will do what it could to ensure its own security; beyond that, the US has been prepared to help. The attacks of September 11, 2001 (9/11) underscored the need to conceive North American defence and security across a range of threats, from defending the perimeter to securing the border between the two countries. Conceiving defence and security from a North American perspective manifests itself most directly in the form of a commitment to continental air defence and the need to provide surveillance as well as a robust response, that is, to assert control of Canadian air space and North American air space in cooperation with the

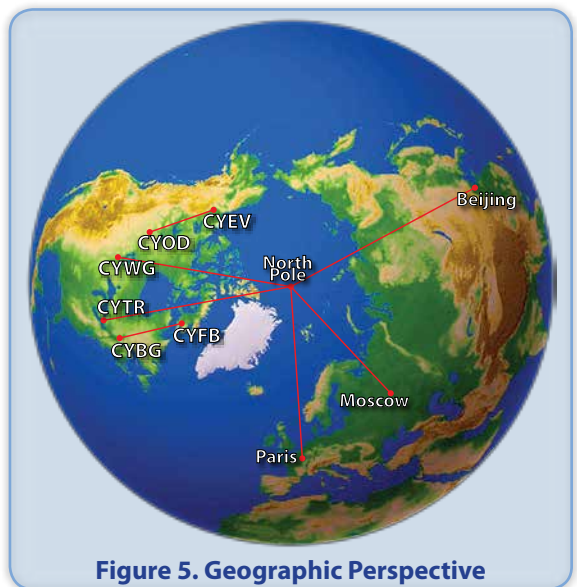


Figure 5. Geographic Perspective

2 This can be seen through successive Defence White Papers, e.g., see Department of National Defence (DND), "1994 White Paper on Defence," chap. 5, Canada-United States Defence Cooperation, <http://www.forces.gc.ca/admpol/1994%20White%20Paper%20on%20Defence.htm> (accessed March 13, 2012); Canadian International Development Agency (CIDA), "Canada's International Policy Statement (2005)," 21, <http://www.acdi-cida.gc.ca/ips-development> (accessed February 23, 2012); and, most recently, DND, *Canada First Defence Strategy (CFDS)*, 2008, http://www.forces.gc.ca/site/pri/first-premier/June18_0910_CFDS_english_low-res.pdf (accessed March 13, 2012), 8.

US. Canada's defence and security needs are thus also shaped by the need to be interoperable with the US.

Canada's military must also be conscious of the imperatives of interoperability with possible coalition partners. Another enduring reality of Canada's geography, history, and small population is commitment to multilateralism and multilateral institutions; security at home is rooted in security abroad. Canada is also a trading nation, dependent on secure borders, respect for international law, and the free movement of goods and people, whether overland or by sea or air. Securing and controlling borders and trading lanes are essential to the national interest. Militarily, this means the CAF will participate, where circumstances dictate, in missions with like-minded states as a responsible member of the international community.³ This is manifestly true in the context of North American defence and results in expeditionary missions in an international context. Except for North Atlantic Treaty Organization (NATO) alliance obligations and existential threats, overseas commitments are discretionary. However, national interests and economic realities can require Canadian involvement in unanticipated campaigns and interventions when security threats emerge. Airpower provides one of the most flexible instruments available to Canadian policy makers. It offers the ability to project power quickly and precisely, but with a minimal footprint; it can be started, stopped, phased, or shaped as required by decision makers and the situation. Coalition operations in Libya provided an example of this flexibility. Protecting and projecting national interests are inherent characteristics of a robust airpower capability.

³ CFDS, 9.

⁴ In addition to the material introduced by the Chief of Force Development (CFD) in *The Future Security Environment 2008–2030* study, specific implications of the future security and operating environment for the Air Force are explored in a series of analytical think pieces, driving out key concepts and the possible implications of trends, particularly technological developments. These are articulated in *Projecting Power: Canada's Air Force 2035* and the *Future Operating Environment (FOE)* and will be further developed in the next iteration of the *FCD*.

Enduring Defence Challenge Deductions for Airpower (EDC):

EDC 1 - The RCAF must provide persistent control of the air, across the country, enabled by appropriate surveillance and response capabilities.

EDC 2 - Strategic air mobility will continue to be required for rapid, comprehensive domestic and international response capability.

EDC 3 - Collaboration and interoperability with our allies will remain a key Canadian airpower attribute.

EDC 4 - The likelihood of collective actions abroad will require a robust and flexible expeditionary airpower capability.

EDC 5 - Our maritime approaches will continue to require the provision of surface and sub-surface airpower support, including maritime warning under North American Aerospace Defence Command (NORAD).

EDC 6 - The RCAF operations in the Canadian Arctic will grow in importance.

Defence and Security Environment

To be useful to force planners, enduring defence challenges must be understood in the context of current (and anticipated) defence and security environment and policy direction.⁴ The future is unknown and unknowable, but constant analysis and review will help ensure that RCAF personnel

Heavier than air flying machines are impossible.

*attributed to Lord Kelvin
(Mathematician, Physicist President
of the Royal Society, c. 1895)*

are positioned to respond to the unexpected and plans are made to address the most likely defence and security scenarios. There is no consensus among international security experts about the defining political-strategic features of the current security environment. Some experts believe that great powers and the states system remain the most critical drivers shaping global security affairs. Others point to the growing influence of networked individuals and organizations with the ability to set the global agenda across a range of issues. Another prominent view is that failed and failing states will dominate defence and security concerns in the coming years. From a Canadian perspective, how the world is perceived by our NATO allies in general, and the US in particular, is important. If one assumes that all these features, in varying degrees, will shape the future security environment, the challenge is to assess on an ongoing basis their relative importance to Canadian defence and security concerns.

Canada's enduring political-strategic circumstances determine that certain features will continue to dominate defence and security concerns, such as the position of the US within the larger global system and the rise of regional powers such as China, India, and Brazil (as well as a resurgent Russia), with the potential to compete with the US regionally and perhaps, eventually, globally. For example, understanding Chinese thinking about the Arctic or Pacific as well as US views of China's strategy are of paramount importance to Canada's security. Another important feature is the evolution of organizations such as the North American Aerospace Defence Command (NORAD), NATO, Organization for Security and Cooperation in Europe (OSCE), and the United Nations (UN). The strategic balance of military power is changing as Asian states close the technological gap with the West in some areas, develop and maintain strong military forces, produce advanced military equipment, and export it to allies and proxies. Given the shifting military balance and the ongoing diffusion of technology, maintaining technological advantage is an important objective.

The traditional goal of national security has been the defence of the state from external threats posed by other states, especially from their military capabilities. Today, the view of national security has expanded to include concerns about instability abroad caused by civil war, genocide, and the forced displacement of populations suffering from hunger, disease, or natural disasters. Tensions are also created as established and stable states attempt to export security to promote stability to regions of the world that are ungoverned or that fail to conform to customary international norms of peace and security. This expanded view of national security requires some understanding of the security implications of a broad set of socio-economic and environmental issues: globalization, migration, urbanization, population displacement, disease and pandemics, demographics, resource scarcity, environmental degradation, climate change, and economic uncertainty.

How precisely all of these issues will manifest themselves as Canada's security and defence problems remains unclear. From a Canadian perspective, an analysis of past interventions would suggest that features like economic upheavals are poor predictors of conflicts. But, it seems likely that issues such as globalization and the concomitant challenge of uneven economic development will continue to create pressures for national governments to intervene on humanitarian and other grounds. Similarly, weather-related disasters, particularly in already fragile states, have increased the pressure on the international community to participate in humanitarian assistance, relief, and evacuation operations. Closer to home, the current discussions surrounding the Arctic circumpolar region may be an example of the nexus of sovereignty, defence issues, border security, transnational crime, environmental concerns, and resource extraction.

Understanding how the CAF will fight is as challenging as understanding where and when. While asymmetric wars and

extremist threats dominate most discussions of the current security environment and most conflicts in the developing world are intra-state in nature, the potential for inter-state wars and competition remains real. The defining feature of 21st century war and warfare—as with past wars—will be the willingness of belligerents to make use of any available forms of violence and technology, depending on their goals and strategy. These can include conventional capabilities and concepts, irregular tactics and formations, terrorist acts, indiscriminate violence, coercion, and criminality. Canadian Armed Forces planners must allow for a dynamic and adaptive enemy.⁵ In short, conflict should not be examined strictly through a conventional or unconventional frame of reference. To understand what warfare may look like in the 21st century, it will also be as important to examine changes in attitudes toward the use and utility of military power as it is to analyse technological and doctrinal developments in war fighting. The CAF cannot assume freedom of movement, access, or superiority everywhere they are asked to intervene. At the same time, the same impetus that has expanded the notion of security to include individual rights has placed constraints on the conduct of war—avoiding collateral damage—placing a premium on precision and intelligence. These trends have wider implications for Western nations that currently depend on their qualitative technological superiority along the spectrum of conflict. Potential adversaries who cannot close that technological gap can take advantage of the constraints on the West's application of military power.

Government Defence Policy and Strategy

Having described the enduring defence challenges and some aspects of the future

Defence and Security Environment Deductions for Airpower (DSE):

DSE 1 - Canada will continue to export security to promote prosperity and stability in regions of the world that are poorly governed or that fail to conform to international norms of peace and security. Whole of government effort will be needed, including the discretionary use of force.

DSE 2 - Expect a requirement for precision strikes, with little collateral damage, and increasingly, non-kinetic options.

DSE 3 - Real-time intelligence and the capability to process, analyse, and transform it into useable knowledge will be essential.

DSE 4 - Expect an increasing need to minimize the environmental impact of all RCAF activity.

DSE 5 - Expect an increasing need to contribute to the CAF-shared situational awareness to detect anomalies in “patterns of life” in an area of responsibility (AOR).

DSE 6 - The CAF should plan on a range of capabilities, assuming it might have to contribute to the fight for access, air superiority, or freedom of manoeuvre.

defence and security environment, this section shows how the enduring and expected security challenges are addressed by the government through policy and strategy such as White Papers and, currently, the *Canada First Defence Strategy (CFDS)* and the Departmental Directive, 2011–2016.

Canadian defence strategy is defined by the three defence roles described in the *CFDS*: defending Canada, defending North America, and contributing to international peace and security. The CAF must be prepared to carry out these responsibilities at home and abroad through maintaining and strengthening multi-role, combat-capable land, sea, air, and special operations forces (SOF).⁶

5 For some examples, see Frank G. Hoffman, *Conflict in the 21st Century: The Rise of Hybrid Wars* (Arlington, VA: Potomac Centre for Policy Studies, 2007); Colin Gray, *Another Bloody Century: Future Warfare* (London: Orion Books, 2006); United Kingdom (UK), Ministry of Defence, *The Future Character of Conflict* (Ancott, UK: Development, Concepts and Doctrine Centre, 2010).

6 *CFDS*.

Defending Canada – Delivering Excellence at Home

The defence of Canada is the government's first priority. The Government of Canada (GC) is committed to ensuring that it is aware of any hostile activity occurring in our territory as well as all approaches to it, and that the CAF can effectively deter threats to our security before they reach our shores and respond to contingencies anywhere in the country. For the RCAF, this means focusing on providing control and surveillance of Canadian airspace, participating in integrated operations in Canada, conducting search and rescue (SAR) missions, and assisting in crisis response across the breadth of the country and its maritime approaches. To place those responsibilities in context, it must be noted that Canada has the second largest territory and airspace in the world, comprising many remote areas and bounded by a vast three-ocean coastline that is the longest in the world. Each year over four million flights occur in Canadian airspace and over 800,000 vessels transit Canadian waters (see Figure 6).⁷ With this level of activity throughout Canadian airspace and territorial waters, monitoring and effectively responding to any potentially threatening or unauthorized activity presents significant challenges that make aerospace capabilities a key component of overall response. In the event of a natural or man-made disaster anywhere on Canadian soil that threatens public safety, airpower is a key enabler to help meet the geographical challenge of providing immediate, coordinated, and sustained military support to other government departments and agencies.

These requirements have a growing level of significance in Canada's northern region. The Arctic is an essential part of Canada's

identity and an area of growing importance internationally. Although the likelihood of conventional military threat to Canada in the Arctic is low, the CAF must still be prepared to act. As well, changing climate patterns and an increasing level of economic activity in the region are posing new security challenges.⁸ While other government departments such as Fisheries and Oceans, Public Safety, and Transport Canada retain the lead for dealing with most security issues in the Arctic, the CAF has a critical role to play in supporting these agencies and providing assistance to our citizens. Addressing these issues will require a Canadian presence on the ground, in the air, and at sea. The GC is committed to increasing the CAF presence and enhancing surveillance and response capabilities in the northern territories.⁹ This will include an important role for the Air Force in conducting surveillance, carrying out SAR operations, and asserting Canadian sovereignty.

Excellence at Home

Delivering excellence at home requires the CAF to **be aware** of anything going on in or approaching our territory, to **deter** threats to our security before they reach our shores, and to **respond** to contingencies anywhere in the country. Specifically, it means that the military will maintain the capacity to:

- provide surveillance of Canadian territory and air and maritime approaches;
- maintain search and rescue response capabilities that are able to reach those in distress anywhere in Canada on a 24/7 basis; and
- assist civil authorities in responding to a wide range of threats—from natural disasters to terrorist attacks.

7 In 2005, there were 4,348,585 flights within Canadian airspace. Transport Canada, *Aircraft Movement Statistics Annual Report 2005* (TP 577) [Ottawa: Statistics Canada, February, 2006], 1–2, <http://publications.gc.ca/collections/Collection/Statcan/51F0010P/51F0010PIE2005000.pdf> (accessed March 13, 2012); Canadian Coast Guard, *Marine Programs' National Performance Report for 2003–2004*, (Ottawa: Fisheries and Oceans Canada, 2003) http://www.ccg-gcc.gc.ca/mp-pm/docs/03-04/pr/mcts_e.htm (accessed November 23, 2011).

8 These challenges include increased maritime and air traffic, the possibility of people and goods entering Canada illegally, environmental concerns, and increased demand for SAR operations.

9 CFDS, 7.



Figure 6. Canada's Geographic Challenges

Defending Canada Deductions for Airpower (DC):

DC 1 - The RCAF will defend Canada through our ability to detect and defeat threats at the earliest opportunity. Consistently demonstrating this ability will serve as deterrence to those seeking to harm our nation. This implies both a networked surveillance and a control capability throughout the nation, including the maritime approaches and the Arctic.

DC 2 - Search and rescue and rapid crisis response will continue to be the hallmark of our commitment to excellence at home. Increasing accessibility and seasonal activity in the Arctic may require adjustments to our SAR posture, including innovative partnerships and basing options commensurate with the potential needs.

DC 3 - The RCAF support to joint operations will place increased demands on our expeditionary capability as extended Army, Navy, SOF, and security partners' Arctic activities increase in frequency and intensity.

Defending North America – A Strong, Reliable Defence Partner

Canada's most important security and defence partner is the US, and Canada is committed to remaining a strong, reliable, and credible defence partner.¹⁰ Currently, more than 80 treaty-level agreements, 250 memoranda of understanding, and 145 bilateral forums on defence exist between the two countries.¹¹ From an air defence perspective, NORAD is arguably the most important of these.

A Strong, Reliable Defence Partner

Being a credible partner in the defence of North America requires the CAF to:

- conduct daily continental operations (including through NORAD);
- carry out bilateral training and exercises with the US;
- respond to crises; and
- remain interoperable with the US military.

¹⁰ Ibid., 8.

¹¹ DND, *Western Hemisphere Policy: Canada-US Defence Relations*, n.d., http://www.forces.gc.ca/admpol/CUS_def_relations-eng.html (accessed May 30, 2012).

Since 1958, NORAD has been the bi-national command responsible for aerospace surveillance and control in North America with regions, air defence sectors, and operations centres as illustrated in Figure 7. Canada and the US agreed in May 2006 to renew NORAD in perpetuity and to add a maritime warning function to its mandate. In 2002,

the US established Northern Command (USNORTHCOM) to consolidate homeland defence under a single commander; NORAD is under the command of USNORTHCOM.

**Defending North America
Deductions for Airpower (DNA):**

- DNA 1 - Shared security arrangements with the US will continue to require close cooperation and integration with the United States Air Force (USAF), including doctrine, technology, equipment, and personnel. NORAD will likely remain the primary means to accomplish this mission.
- DNA 2 - Maritime domain awareness will continue to grow in importance.

**Contributing to International
Peace and Security –
Projecting Leadership Abroad**

In an increasingly interconnected environment, instability and conflict in one part of the world have real potential to threaten the basic quality of life here in Canada. As such, Canada must address threats to our security before they reach our shores. Providing international leadership provides Canada the credibility and trust needed to help influence and shape the environment in ways that promote our security. This requires the CAF to have the necessary capabilities to make a meaningful contribution across the full spectrum of

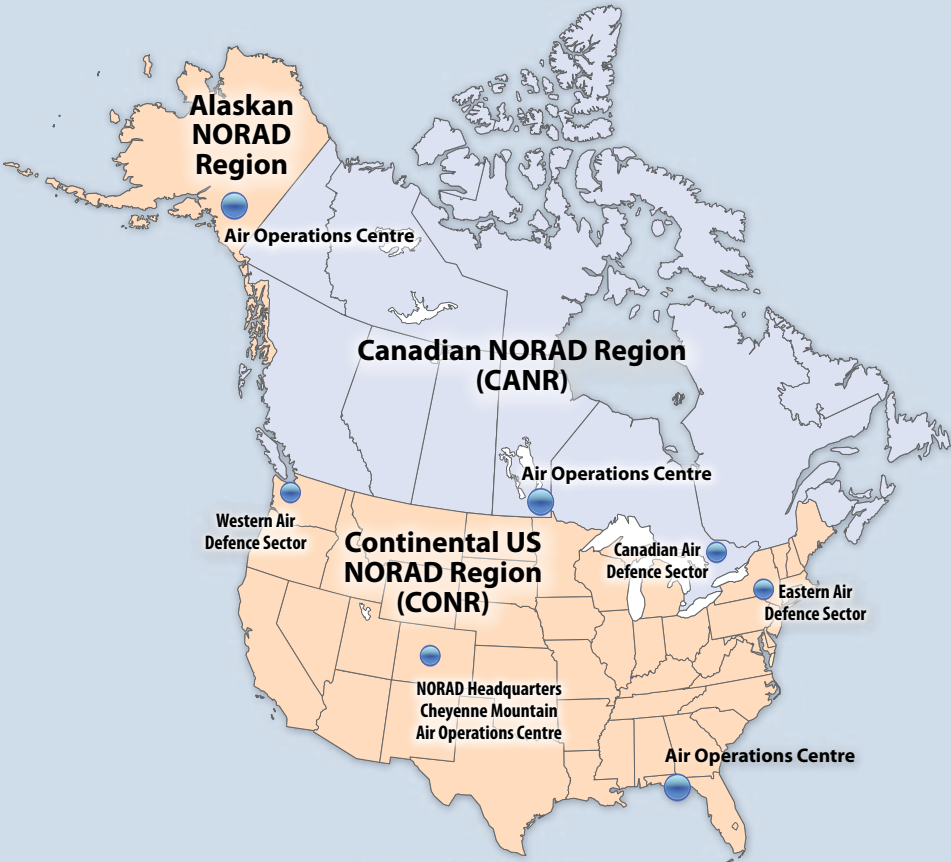


Figure 7. NORAD

international operations, from humanitarian assistance to stabilization operations to combat.¹² Constrained by the enduring challenge of population and geography, the GC's goal of projecting leadership abroad manifests itself both as a commitment to multilateralism and multilateral institutions as well as in the whole-of-government (WoG) approach to international affairs. Accordingly, Department of National Defence (DND) and the CAF are working closely with other departments and agencies, such as the Department of Foreign Affairs and International Trade, the Canadian International Development Agency (CIDA), and the Royal Canadian Mounted Police (RCMP), in order to operate as an integrated and effective team.

Over the last decade, the CAF has contributed to a wide range of collective actions in response to threats to international peace and security. For the Air Force, operations spanned a spectrum that included participating in humanitarian assistance, disaster relief, and drug interdictions; enforcing embargoes and no-fly zones; and contributing to both peace-support and combat operations. These experiences have demonstrated the value of a strategically relevant, operationally responsive, and tactically decisive Air Force. They have also highlighted the need to make the RCAF more expeditionary.

Projecting Leadership Abroad Involves:

- maintaining combat-capable units at the right level of readiness;
- providing deployed personnel with the right mix of equipment so they can take part, on their own or with allies, in the full spectrum of operations—from countering asymmetric threats like improvised explosive devices to reconstruction efforts in a harsh and unforgiving environment; and
- working closely and developing a coherent overarching strategy with departmental partners.

¹² CFDS, 9–10.

While Canadian defence priorities have remained relatively consistent throughout the past half-century, they manifest themselves differently based on the political, economic, and international context. At home, Canada has reconfigured its defence and security posture in recognition of the link between Canada as an operational theatre and its ability to deploy abroad to promote stability. Committed to a WoG approach to international affairs through coordinated use of its national power (primarily through the UN and NATO, but also through coalitions of like-minded states), Canada remains committed to multilateralism. In sum, Canadian defence policy and the CAF are reconfiguring and transforming to address an unstable world where some of the threats are more ambiguous, but still potentially lethal and strategic in impact.

International Peace and Security Deductions for Airpower (IPS):

IPS 1 - Full-spectrum expeditionary operations will continue and are expected to employ the full range of Canadian airpower capabilities.

IPS 2 - The joint and integrated nature of operations will require coordinated training plans and synchronized readiness levels.

IPS 3 - Cultural intelligence of non-traditional allies will become increasingly relevant as we will work with a growing array of global partners.

CAF Strategies and Operating Concepts

Canadian Armed Forces Vision

The CAF vision is focused on achieving increased strategic effects for Canada by providing a world-class force at home and abroad, with an end state described as:

Defence will be agile, flexible, affordable and resilient. We will raise, generate, employ and sustain world-class forces that work cohesively to advance Canadian interests.

*Domestically and internationally we will be a leader and a trusted partner, renowned for our operational capability and our financial and management excellence.*¹³

The CDS' guidance has included a description of an air/land/sea interface within which the CAF seeks to optimize its ability to achieve focused and integrated effects. To achieve this integration, all elements of the CAF must extend their environmental expertise beyond the traditional synchronization of environmental capabilities into a more interdependent, beyond joint form of operations. The defence mission is to:

*Provide combat-effective, multi-purpose forces at home and abroad to protect Canada and Canadians.*¹⁴

For the Air Force, the inherent characteristics, applications, and tenets of airpower present many dynamic options to deliver, enable, or contribute to these integrated effects—whether capabilities operate within close proximity to the air/land/sea interface or not.

Just as the RCAF's strategic operating concept must evolve in response to the strategic environment, so too must the entire CAF. Although ongoing transformational efforts

will likely bring further refinement to CAF structure, integration of force application at the tactical level will certainly continue. Before discussing specific Air Force concepts, it would be instructive to briefly examine where development is headed in other elements of the Defence Team.

Royal Canadian Navy Strategic Concept

For many decades, airpower, whether organic or in direct support, has been a key enabler of maritime power. Our ship-borne helicopter air detachments (HELAIRDET) and land-based, long-range patrol aircraft act as a direct extension of the Royal Canadian Navy's (RCN's) sense, shield, and act capabilities. Over these many years, our close cooperation has worked its way into the very fabric of our "DNA," helping define who we are and how we think. Going forward, we have robustly increased the capability of the Aurora and will exponentially enhance the HELAIRDET contribution to a naval task force's (TF's) sense capability with the Cyclone helicopters. As these capabilities are fully integrated into the Navy's war-fighting ability, the entire joint force will reap benefits from improved shared situational awareness, enhanced command and control (C2) possibilities, and better force protection (FP) measures. As we did with the Argus

"Canada's forces at sea will need to remain broadly balanced against a wide range of eventualities across the spectrum of conflict, with sufficient numbers of platforms to operate simultaneously both at home and abroad, while also holding at readiness a task group for major contingencies. Our maritime forces will continue to need the combat capabilities that will permit them to control events at sea through decisive action in all three maritime dimensions—air, surface, and undersea—but equipped with weapons and sensors that are better optimized for the littorals, and increasingly capable of precisely calibrated and graduated responses against a broader range of threats at sea. Our maritime forces will need to remain highly interoperable, better equipped to address growing security obligations in a gradually opening Arctic, as well as to influence events from the sea by being able to mount expeditions of Canada's joint forces abroad, to sustain their operations from a joint seabase across a range of relatively permissive scenarios, as well as to contribute to decisive joint action ashore."¹⁵

13 DND, CDS, "Departmental Directive 2011–2016, Implementation Directive for DND/CF Strategic and Operating Review (SOR)," 29 July 2011, 1, <http://vcds.mil.ca/cas/dmcs2005/FilesO/DMCS28036.pdf> (accessed March 13, 2012).

14 Ibid.

15 DND, *Horizon 2050: A Strategic Concept for Canada's Maritime Forces*, Final Draft V9.3.4, Part 3, 3.1–3.2.

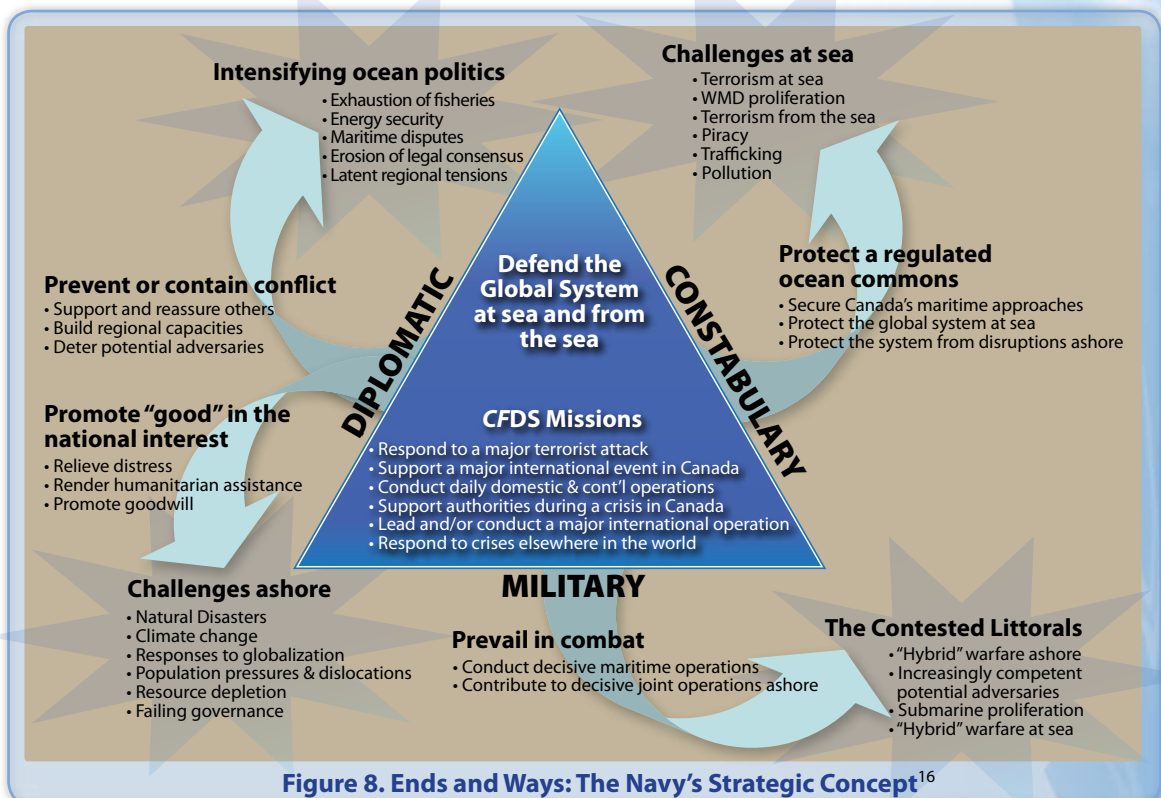
and Sea King, we must continue to develop airpower to conduct maritime operations in our domestic approaches, the littorals, and for ships at sea.

The RCN has drafted *Horizon 2050* to complement its previous strategy document, *Leadmark*. *Horizon 2050* acknowledges the growing interdependence of nations on global trade, and, therefore, the common interest for regulated, secure ocean access for commerce. While Canada as a maritime nation takes full advantage of easy access to the seas, this benefit does not come without responsibilities. Recognizing that it is in our nation's interest to ensure continued safe ocean commerce, the RCN, supported by maritime airpower, will be prepared to help safeguard this access.

The RCN's strategic concept to meet the CFDS roles and missions is described through three roles of maritime power: diplomatic,

constabulary, and military. The functions which flow from these roles are depicted in Figure 8. The RCN's initial force development (FD) effort to deliver the maritime power needed for its roles and functions envisions a multi-purpose Canadian surface combatant (CSC) platform that will provide integrated command and control (ICC) capability that is networked with multiple joint sensors and shooters.

In addition to the traditional "blue-water" role and an emerging presence in the littorals, the Navy will be increasingly capable of operating in the Canadian Arctic. Planning is under way for procurement of arctic offshore patrol ships (AOPS) and establishing a berthing and refuelling facility at Nanisivik. This capability, however, will be quite modest and remain seasonal for the foreseeable future. While the AOPS will not have organic Air Force assets, they will be capable of helicopter operations, including the Cyclone.



16 Taken from *Horizon 2050*.

RCN Concept Deductions for Maritime Airpower (RCN):

RCN 1 - Increasing littoral presence will necessitate new maritime helicopter doctrine and tactics, techniques, and procedures (TTP) to account for different Shield and Act requirements.

RCN 2 - The “blue-water” and littoral aspirations of the Navy mean a continued need for antisubmarine warfare (ASW) and antisurface warfare (ASUW) capabilities.

RCN 3 - Developments in RCN strike and command capabilities will necessitate network integration with other Air Force strategic and tactical assets, including unmanned aircraft (UA) and joint strike fighters (JSF).

RCN 4 - The AOPS capability will increasingly expose our rotary-wing (RW) crews to seasonal Arctic operations with impact on training and equipment.

RCN 5 - Surveillance and reconnaissance support to Arctic operations will increasingly include support to Navy Arctic operations.

Canadian Army Strategic Concept

As is the case with the RCN, the RCAF has a long history of training and fighting with our nation's soldiers. Whether we are watching their back from our perch high above the battlefield, supporting troops in contact with the enemy, inserting soldiers directly into the fight, or extracting them from theatre for well-earned rest and relaxation, it is what we do and it is part of who we are. Where goes the soldier, so too goes the airman.

In Afghanistan, we experienced a growing convergence of cultures in command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) efforts, with the Air Force and Army working side by side operating Sperwer and Heron UAVs (unmanned aerial vehicles) as well as exploiting intelligence, surveillance and reconnaissance (ISR) capabilities inherent in tactical aviation—a trend that will

continue. Together with the Army, we must ensure that the joint capabilities and lessons learned in Afghanistan become ingrained in our future operations. The best means to do this is via increased exposure of airmen to opportunities available in joint exercises and joint headquarters (HQ). 1st Canadian Division (1 Cdn Div) HQ in Kingston is a developing entity with the potential to provide a focal point for future integration of air and land forces at the operational level. The RCAF will work towards developing the leaders and structures that will enable component-level integration with 1 Cdn Div HQ for joint force generation (FG) and force employment (FE) in operations.

The Army's strategic plan is found in the second edition of *The Army: Advancing With Purpose*, which was completed in 2009. As stated within this document, the Canadian Army Commander's vision is that:

The Army will produce combat effective and sustainable forces that deliver focused and integrated land effects across the full spectrum of operations. These forces will be strategically relevant to the Government of Canada, as well as operational and adaptive, to ensure full integration within a comprehensive joint, interagency, multinational and public (JIMP) context. At the tactical level, formations and battle groups will focus on battle winning and will continue to develop campaign winning capabilities, thus setting the conditions necessary to achieve strategic goals. The Army will synchronize [FD] to achieve joint integration and combined interoperability with other CF elements, the forces of the United States, other ABCA [America, Britain, Canada, Australia] countries and NATO allies. As a broadly based representative national institution with a proud heritage, the Army will provide a disciplined force of last resort and contribute to the promotion of national values and objectives at home and abroad.¹⁷

17 DND, Commander Land Force Command, *The Army: Advancing With Purpose*, 2nd ed. (Ottawa, Director of Land Strategic Planning, 2009), Part 2, 23, <http://lfcms.kingston.mil.ca/Document.aspx?DocID=143000440170741> (accessed March 13, 2012).

The Army of Tomorrow (AoT), as outlined in *Land Ops 2021*,¹⁸ will consist of a fully networked family of combat vehicles that permit the force to conduct operations throughout a wide geographic area. The land force will remain capable of full spectrum operations; however, the dispersed elements will be somewhat independent from each other and at varying stages along the spectrum, as reflected in their air mobile concept. Figure 9 depicts this concept.

Changes to the Army's domestic force structure are also worth noting for their second- and third-order effect on Air Force support. As with the Navy, the Army will be increasingly capable of conducting operations in the Canadian Arctic. Plans include establishing a Canadian Forces Arctic Training Centre (CFATC) at Resolute Bay, specialized Arctic Response Company Groups (ARCG), and increased Ranger capacity.

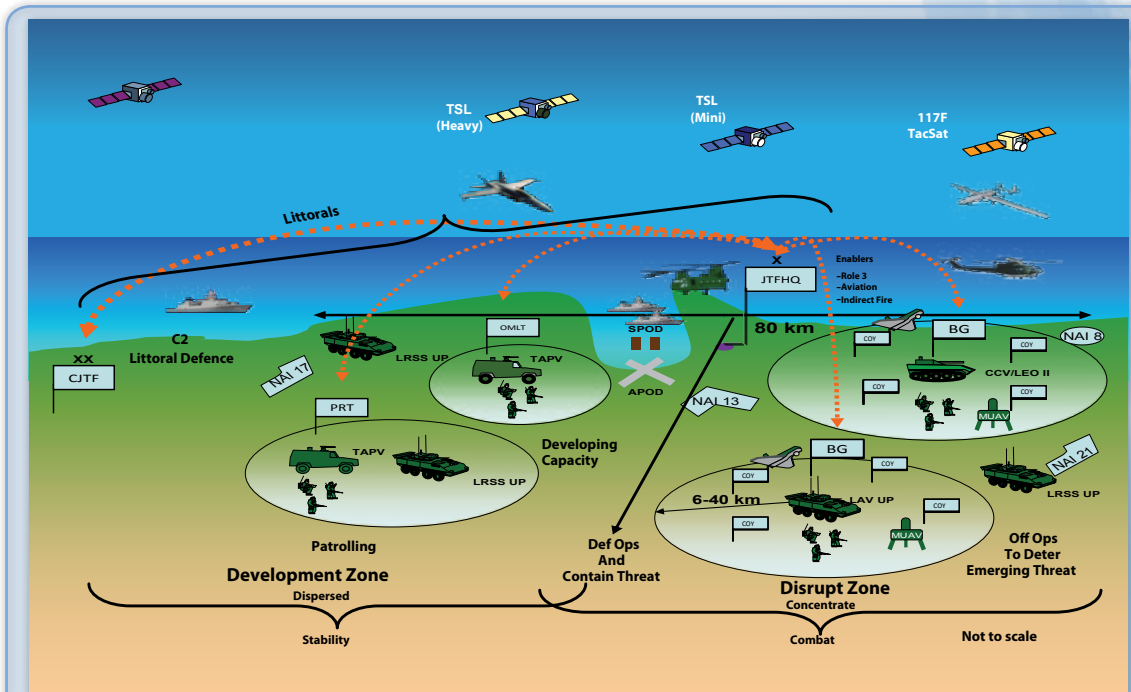


Figure 9. Army of Tomorrow Concept

While the Army is responsible for generating land capabilities, it must do so in conjunction with other elements of the CF. For example, unlike in most other [W]estern military forces, the Canadian Army does not possess integral aviation assets. However, these capabilities are fundamental to the successful conduct of land operations as they are an essential manoeuvre element of the combined arms team. As the CF and Air Force enhance these capabilities, close cooperation and full integration with the Army's future land combat systems and force generation activities are among the Army's top priorities.¹⁹

The Army: Advancing With Purpose

18 DND, *Land Operations 2021 – Adaptive Dispersed Operations – The Force Employment Concept for Canada's Army of Tomorrow* (Kingston, ON: Directorate of Land Concepts and Design, 2007), http://dsp-psd.pwgsc.gc.ca/collection_2009/forces/D2-188-2007E.pdf (accessed March 13, 2012).

19 DND, Commander Land Force Command, *The Army: Advancing With Purpose*, 2nd ed. (Ottawa, Director of Land Strategic Planning, 2009), Part 1, 14, <http://lfcms.kingston.mil.ca/Document.aspx?DocID=143000440170741> (accessed March 13, 2012).

Army Concept Deductions for Airpower

CA 1 - The AoT concept for adaptive, dispersed, full-spectrum operations will necessitate new doctrine and TTP for integrating airpower. All of the Canadian airpower roles will be required for the Army to achieve its vision, with an interdependent reliance on mutual C4ISR capability to detect and target threats.

CA 2 - The networked AoT will require connectivity with RCAF tactical assets for voice, data, and video exchange.

CA 3 - The CFATC, ARCGs, and a general increase in year-round Army Arctic operations will increase demand for Air Force support, with a resulting demand on training and equipping the RCAF for a persistent Arctic presence.

Special Operations Forces Strategic Concept

Canadian Special Operations Forces Command's (CANSOFCOM's) mission is to provide the GC with agile, high-readiness SOF capable of conducting special operations across the spectrum of conflict at home and abroad. CANSOFCOM needs to force generate and deploy special operations task forces (SOTF) to conduct:

- a. counterterrorism (CT) operations: offensive and defensive measures taken to prevent, deter, pre-empt and respond to terrorism;
- b. maritime counterterrorism operations: CT operations within the maritime environment; and
- c. high value tasks: other missions at home or abroad, kinetic or non-kinetic, that may be assigned by the GC, including: special reconnaissance; direct action; counter-proliferation; non-combat evacuation; and defence, diplomacy, and military assistance.

The SOTF must operate with the necessary enablers and integrated elements to allow the conduct of the full range of its task set. Particularly, Canadian SOF must be able to deploy tactically and strategically to project the necessary force to locate, identify, track, and monitor adversaries and to provide the necessary kinetic or non-kinetic surgical precision effects as requested by the GC.

Airpower effects are vital for successful CANSOFCOM operations, from airlift, to ISR, to fires. Currently, 427 Special Operations Aviation Squadron is embedded as an integral element under CANSOFCOM operational command, providing dedicated utility tactical transport helicopter (UTTH) support. CANSOFCOM looks to the Air Force for the provision of the remaining effects.

Special Operations Forces Deductions for Airpower (SOF):

SOF 1 - CANSOFCOM has a vested interest in Air Force capabilities, structures, and airpower developments and must therefore be considered in FD.

SOF 2 - The Griffon helicopter is the primary supporting air asset; therefore, replacement and upgrade changes will need to accommodate CANSOFCOM needs.

SOF 3 - CANSOFCOM requires connectivity with RCAF tactical assets for voice, data, and video.

SOF 4 - Air Force doctrine and TTP will need to keep pace with the evolving SOF employment concept.

SOF 5 - CANSOFCOM requires some integral air capabilities to meet required high readiness needs.

Space Strategic Concept

Since 2006, the development, delivery, and management of space capabilities have been the responsibility of the CFD, reflecting the centralized approach to C4ISR and joint capability development.²⁰

20 Vice-Admiral J. A. D. Rouleau, Letter to the VCDs, 3000-1 (DG IFD), "National Defence Space Policy," 15 January 2010, <http://dmcs-prk.mil.ca/dmcs/FilesO/DMCS83937.PDF> (accessed March 13, 2012).

Under CFD, one of the Director General Space's (DG Space's) missions is to develop and lead Canada's defence space programme.

Subject to the outcome of current transformation initiatives, plans are progressing to grow DG Space into a discrete environmental domain with its own career fields and human resources (HR) management process. Given the role of Air Force personnel in DG Space staffing, training, and development activities, the transition to a more robust space environment will require careful management on the part of the RCAF.

Space Concept Deductions for the Air Force (SP):

SP 1 - The evolution of space into a discrete environmental domain will necessitate realignment of RCAF human resources in relation to postings, career streams, and post-graduate training.

SP 2 - As a user of space capabilities, the Air Force must ensure training focuses on product exploitation vice the FG and FD of capability.

SP 3 - Our doctrine must align with that produced by Director of Space Development (D Space D) and account for space as a separate domain.

Cyber Strategic Concept

A cyber task force (TF), stood up in 2010, is looking at FD issues for CAF operations (ops) in the cyber environment. Based on its preliminary work, the cyber TF has developed a road map that will enable military ops in the cyber environment, including organizational structures and resource estimates. The RCAF is heavily reliant on electronics systems, whether operating or in the provision and use of information. Developments in cyber technology, operating concepts, and policy require Air Force input.

21 For a more complete discussion on joint C2 relationships pertaining to the employment of air forces in operations see B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine*, 1st Edition, March 2012, 25–26, http://www.rcaf-arc.forces.gc.ca/cfawc/CDD/Doctrine/Pubs/Operational/401_Series/B-GA-401-000-FP-001.pdf (accessed April 23, 2012).

Cyber Concept Deductions for the Air Force (CY):

CY 1 - Capability development in the cyber environment will be closely monitored by the RCAF with the objective of learning how to best exploit cyber operations and technology for air operations.

CY 2 - The RCAF will increase its awareness of the impact of cyber activity on its operations and contribute to CAF cyber operations capability.

Joint Operating Concept

"The FE commander (FE comd) is the designated, operational-level commander who organizes assigned/attached forces to best accomplish the mission based on their vision and concept of operations. An FE comd normally exercises operational command of assigned forces. The FE comd provides direction and guidance on command and control relationships. The FE comd normally gives the joint force air component commander (JFACC) authority to accomplish assigned missions and tasks, including operational control of assigned forces and tactical control of other forces made available.

"The JFACC is the designated commander responsible for making recommendations to the FE comd on the proper employment of all assigned, attached, and made-available [air] forces. The JFACC is responsible for all aspects of the conduct of the air campaign ... and overseeing joint [air] operations ... Depending on the scale of a given operation, the JFACC will recommend to the FE comd that C2 of [air] forces remain with the JFACC or be delegated to an independent ACC or to another component commander. ... In Canada, [Commander 1 Canadian Air Division is the JFACC and also commands the Canadian NORAD Region] and is accountable to Commander NORAD to exercise C2 of all forces assigned or made available to the NORAD mission in the region."²¹

From the perspective of the requirements of the Air Force of today, FG of airpower for the supported commanders is the primary function of the Commander Royal Canadian Air Force (Comd RCAF) who also provides expert advice on employment of airpower and retains responsibility for airworthiness, flight safety, doctrine, and the gathering of lessons learned. An operational readiness (OPRED) declaration from the Comd RCAF is the instrument used to initiate a transfer of authority, which moves RCAF assets from an FG posture to the supported commander for FE. An OPRED indicates that the Air Force assets are ready to deliver airpower effects in the designated area of operations in conjunction with the joint and combined forces involved. The preparation period for operations can range from little to no notice (routine CFDS missions, SAR, rapid response) to months (emerging international operations). While much of what the RCAF does necessitates the maintenance of high-readiness levels at all times, efforts to rationalize joint-force readiness post-Afghanistan are underway.

Joint Concepts Deductions for the Air Force (J):

- J1 - To ensure a timely OPRED declaration, it will become increasingly important to synchronize readiness levels and training opportunities with the joint force.
- J2 - We must develop leaders with broad airpower knowledge who are capable of ACC functions within the construct of a deployed composite wing.
- J3 - Comd RCAF must have the robust readiness evaluation capability to fully exercise his OPRED responsibilities.
- J4 - The RCAF will require a robust lessons learned process, identifying and implanting lessons from the strategic to tactical levels.

Although the lessons from our combat experience in Afghanistan and Libya are still being analysed by the nascent RCAF lessons learned structure, identified lessons are sure to shape how

the RCAF conducts joint operations in the future. Preliminary results indicate that the air expeditionary wing structure, with composite air assets, should continue to form the nucleus of our airpower C2 structure.

Summary of the Deductions – Airpower Perspective

A number of broad conclusions as to the direction of airpower in the 21st century are evident from the preceding summary of defence and security challenges as well as the current strategic and operational needs of the GC and the CAF.

Defending Canada in the current strategic and political environment requires capabilities that allow surveillance and control of the entirety of the Canadian airspace, coast and maritime approaches. Securing both Canadian and North American borders, as well as ensuring the security of expeditionary forces, requires comprehensive and sustained intelligence, surveillance and reconnaissance (ISR) capabilities to achieve situational awareness. Canadian and North American security also requires an Air Force that has the power and reach (see Figures 3 and 4) to allow Canada to maintain its commitment to the shared defence of the continent and its ability to defend Canadian interests and citizens. While it is possible to have an Air Force able to respond to natural disasters, provide humanitarian aid, and maintain surveillance of our air and maritime approaches, without the coercive ability to control and shape the environment when, where, and how we desire, CAF airpower will have limited value. The expanded range and scope of threats, and the speed with which they could materialize, also require agile and relevant airpower.

The demands of international commitments are less clear, particularly where and how many could arise. However, irrespective of the frequency, international commitments will require a rapid response, underpinning the need to maintain robust expeditionary capabilities. The possible nature of the operations and a commitment to a WoG approach also requires the capability to sustain these operations for often undetermined lengths of time as well as enhanced interoperability and C4ISR capabilities to work with (and even provide the lead for) allies and other government agencies and departments. The CAF will likely deploy as part of an integrated Canadian team that will be able to provide stabilization, reconstruction, and governance programmes. The latter components will have to be sustained over a longer period of time than has traditionally been the case for what would have been defined as “surge” operations, especially when the WoG approach drives public and political expectations.

In addition, the RCAF’s optimum contribution to national strategic effects will be realized: first, through fully integrating its own capabilities; second, through full integration with the Army, Navy, and SOF, as well as other government departments; finally, through interoperability with allies and coalition partners. The RCAF will be an agile and integrated organization led and staffed by people who have both the professionalism and expertise that Canadians have come to expect from their military, and who are also able to adapt to rapid changes in their operating environment—a skill that is fundamental to ensuring success given the possible range of conflicts in which the CAF could find itself. The need to deploy rapidly with a robust force and for a sustained period both at home and abroad places a premium on global mobility and expeditionary capabilities, defined by reach, speed, agility, lethality, and combat readiness. A key component of this expeditionary capability is the need to build the support systems for sustainment.²²

The next chapter takes the analysis presented above to its conclusion by identifying the Air Force mission, the operational capabilities needed to achieve it, and those institutional responsibilities and functions that enable them.

22 Annex A contains a summary of the deductions from the above analysis.

Chapter 3

The RCAF Mission

Introduction

With the previous chapter providing the strategic analysis and deductions for the Air Force (listed in Annex A for ease of reference), Chapter 3 now takes that work to its logical outcome by identifying:

- a. the key themes within the analysis in order to define the overall Air Force mission;
- b. the resultant core capabilities and attributes the Royal Canadian Air Force (RCAF) requires in order to achieve that mission; and
- c. the institutional responsibilities and processes that enable the mission.

Defining the RCAF Mission

A number of themes identified from the strategic deductions arrived at in Chapter 2 are useful in helping define our airpower mission:

a. Relevant:

- (1) trained and equipped for an increasing and ongoing focus on the Arctic region;
- (2) interoperable at all levels with the United States Air Force (USAF) and, thus, other US forces; other key allied

Air Forces (United Kingdom, Australia, and New Zealand), and NATO; and

- (3) innovative airpower use in urban and complex environments with reduced collateral damage.

b. Responsive:

- (1) recognizes the need for both institutional and individual agility in a dynamic and unpredictable defence environment: airpower will enable timely Canadian Armed Forces (CAF) response; and
- (2) the need to balance defence of Canada with maintaining expeditionary capabilities.

c. Effective:

- (1) refers to the importance of precision and its relationship to real-time intelligence;
- (2) recognizes the growing importance of non-kinetic airpower capabilities;
- (3) stresses the need for persistence; and
- (4) embraces the importance of being fully integrated with expanded joint training for readiness, a growing dependence on networks and joint

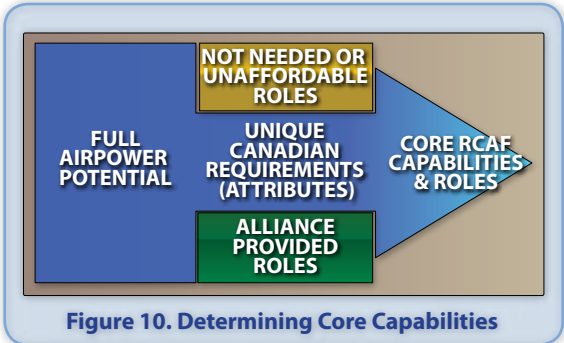
connectivity, and the need to be able to work closely with a range of domestic partners.

These themes provide the logical basis for the resultant RCAF mission statement:

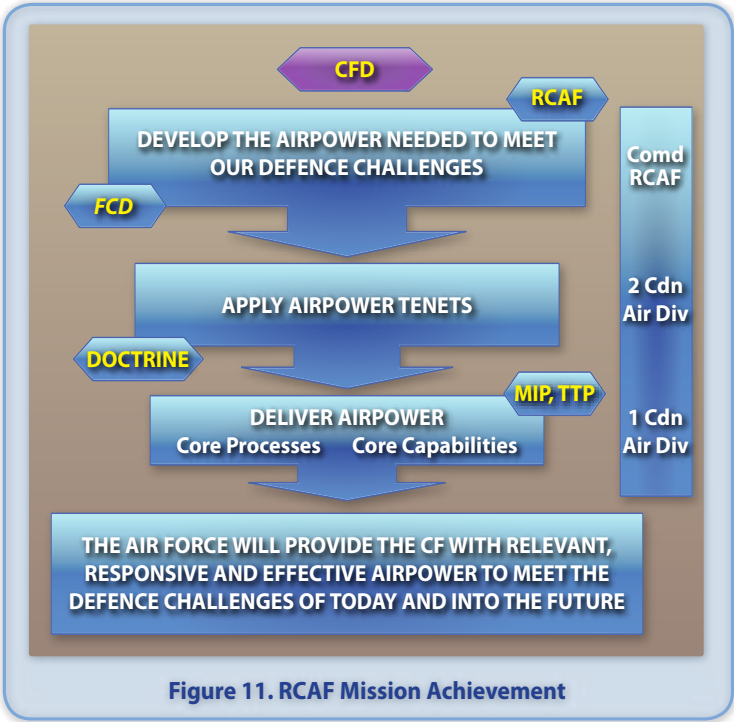
The RCAF will provide the CAF with relevant, responsive and effective airpower to meet the defence challenges of today and into the future.

Achieving the Mission – Core Capabilities and Attributes

Airpower has the ability to deliver effects that contribute to joint objectives at the tactical and operational level and also to independently achieve strategic objectives; however, there is nothing the RCAF does for its own purpose. Canadian and allied doctrine describes the various functions and capabilities that airpower can fulfill and the roles it contributes to deliver these effects; however, few air forces are capable of carrying out all of the possible airpower roles, and Canada is certainly no exception. The roles and missions assigned to CAF airpower and the need to be able to provide the government with a flexible instrument of national power mean that the RCAF will continue as a global air force, with a robust if limited spectrum of conventional capabilities sufficient to meet national and continental defence requirements, including the ability to participate in operations on a global basis as mandated by the government. Therefore, as a global force, the RCAF must be prepared to lead and support coalition operations across the spectrum of conflict.¹ Figure 10 provides a graphical depiction of the model described above and used to determine the RCAF's core airpower needs.



While the themes drawn from the preceding chapter have led to the development of our mission statement, the deductions and attributes from this mission analysis reveal the specific Canadian airpower capabilities and roles needed to achieve it. The RCAF's core capabilities represent our institutional and operational ability to deliver expert levels of airpower with uniquely Canadian attributes. Only by developing these core airpower capabilities, along with excellence in our institutional processes will we achieve our mission to deliver relevant, responsive, and effective airpower to the joint force. Figure 11 depicts the effort



1 See *Aerospace Capability Framework*, 15–17, for categories of Air Force discussion.

and breadth of responsibility necessary to achieve this model. The determination as to what these core capabilities and attributes are is derived directly from the strategic deductions in Chapter 2. By examining each discrete deduction, the Canadian necessity for a particular type of airpower capability can be derived. Furthermore, the analysis of each deduction also allows us to identify those attributes unique to the circumstances

challenging the RCAF and Canadian airpower. Together, these capabilities and attributes provide the unique character of Canadian airpower and will help focus the institutional activities that enable relevant force generation (FG).

While a complete summary of the deductions is available at Annex A, the following tables present the results of our analysis.

RCAF Core Airpower Capabilities	Control of the Air		Attack			Surveillance & Reconnaissance	Air Mobility		Support to Joint Operations and the Civil Power			
Core Roles	Battlespace Management	Counter-air	Counter-land	Counter-sea	Strategic Effect	Persistent Surv, Routine Patrols, Cued Reconnaissance	Airlift	AAR	Maritime Support	Airmobility	Pers Recovery	Situational Awareness
Airpower Missions	Airspace Control, Navigation Systems, Enable Air Commerce, Air C2	OCA, DCA, Air Defence	Interdiction, CAS	ASW, ASUW	Deep Strike	RAP, Early Warning	Strategic or Tactical	ASW, ASUW	Battlefield Mobility, Special Ops	SAR	Aeromedical Evacuation	SIGINT, IMINT
The core capabilities and roles present “what” CAF airpower <i>must</i> do and are prescriptive for the RCAF. The B-GA-400 doctrine series describes “how” airpower is employed to accomplish these core requirements.												
Core Capability	Each core capability provides a discrete set of effects that leverage airpower’s strengths and advantages and can be conducted independently or is provided primarily by the Air Force in support of critical joint requirements. While some of the missions and tasks can also be conducted by other environments, for example, naval fires ashore or indirect land fire in a counter-air effort, they will be limited to situations where sustained operations, range, and mass are inconsequential. These core capabilities and roles will typically be planned, tasked, and executed with the air component commander (ACC) as supported commander.											
Core Role	Each core capability has one or more subordinate core roles and associated missions that are required to achieve full effect. Force development and force generation (FG) responsibility for these roles remains primarily with Comd RCAF.											
Airpower Missions	These are the missions the RCAF will conduct to achieve the core capabilities and roles needed by CAF airpower. Air doctrine, including tactics and procedures to conduct these missions is developed by the RCAF and feeds, in turn, CAF joint doctrine.											
Core Capability	In the Canadian context, the RCAF is the sole provider of airpower considered organic to—and therefore a critical requirement of—other environments. This core capability and the subordinate roles and missions will be executed by RCAF assets and personnel, typically under operational command (OPCOM) or operational control (OPCON) of another commander.											
Core Role	These roles and subordinate missions may be conducted by the RCAF alone; however, the effects are part of a larger joint effort. Search and rescue (SAR) is mandated by the GC and conducted primarily by RCAF assets (as either a primary or secondary role); civilian (Civil Air Search and Rescue association [CASARA]) and other government department (OGD) aircraft also participate as required.											

Table 1. RCAF Core Airpower Capabilities

Government Mandated Non-Defence Missions	
Air Demonstration	VIP Transport

Table 2. Assigned Defence Tasks

Note: The RCAF may be required to perform some roles and missions—such as airborne early warning (AEW), suppression of enemy defences (SEAD), combat search and rescue (CSAR), and airborne command and control (C2)—which are not necessarily organic to the RCAF at present. When required, such capabilities are typically obtained through coalitions and partnerships.

The RCAF will be:	
Integrated	Joint
Expeditionary	Interoperable
Ready	Agile
Environmentally Sensitive	Culturally Aware
Resilient	
Canadian Airpower must be:	
Doctrinally Responsive	Joint
Domestically Assured ²	Networked
Precise	Global
Balanced with non-kinetic and lethal options	

Table 3. RCAF Airpower Attributes

Each core capability provides a discrete set of effects that leverage airpower’s strengths and advantages and can be conducted independently or are provided primarily by the Air Force in support of joint requirements. Further, each capability has one or more subordinate roles that may be required to achieve its full effect through the subordinate missions and tasks. While some of the missions and tasks can also be conducted by other environments, for example, naval fires ashore or indirect land fire in a counter-air effort, they will be limited to situations where sustained operations, range, and mass are inconsequential.

Finally, the planning process to accomplish the core capabilities, the training to succeed in the roles and missions as well as

tasking assets to execute them will be the air component’s primary responsibility in a supported, rather than supporting, position. In the support to joint operations and in the civil power capability, the RCAF is specifically equipped for the indicated roles and missions; however, another organization will normally be involved in a substantial way, with the air component as the supporting, rather than supported, component.

The Core Capabilities Defined

Control of the Air. Gaining sufficient control of the air is an essential requirement across the spectrum of conflict. Having control of the air safeguards sovereignty in peacetime, controls access to it in times of tension, and provides safety from enemy air access in times of conflict. Moreover, control of the air provides friendly forces with the freedom to conduct operations at the time and place of their choosing without prohibitive interference from an adversary. Consequently, gaining control of the air is normally afforded the highest priority in any military operation. Control of the air can be described as a temporal requirement for a specified and limited event, a geographical requirement over a specific area of operations, or an enduring requirement for ongoing denial of use purposes.

Further, while the requirement for the counter-air role is undeniable, so too is the demand for systems to provide effective management of the battlespace. In one sense, this basic demand has a purely military

2 “Domestically assured” refers to the need to have the airpower capabilities and quantity necessary to achieve the domestic roles and core missions given in the CFDS as detailed in the Defending Canada and Defending North America deductions for airpower.

objective (to facilitate the use of battlespace while affording the flexible application of joint fires); however, so too must the systems exist to facilitate air commerce as soon as the airspace control authority (usually the dual-hatted function of the air component commander [ACC]) deems this to be practicable. Fundamentally, it will be a normal requirement that both battlespace and commercial airspace management activities will have to be met simultaneously and potentially in the same airspace. Facilitating the national commerce by air is an undeniable demand of any government.

Attack. Airpower continues to prove its flexibility and adaptability to the changing character of warfare. From close support to troops on the battlefield to coercion of leaders at the strategic level, the ability to attack from the air, at the time and place of our choosing, remains the sine qua non for airpower. The RCAF maintains a credible offensive capability through its ability to attack, or hold at threat, targets throughout an area of operations. The objectives of the attack capability are to:

- a. deny the enemy their choice of strategy;
- b. create favourable circumstances to employ our chosen strategy;
- c. reduce the requirement for other friendly forces; and
- d. reduce risks, casualties, and cost.

Typically, the counter-land and counter-sea roles are to:

- a. curtail interference from hostile land and naval forces;
- b. inhibit the enemy's ability to manoeuvre;
- c. deny the enemy an ability to concentrate their forces; and

- d. disrupt the enemy's command, control, and communications capabilities.

Surveillance and Reconnaissance. This core capability uses both ground-based and airborne sensors to detect and discriminate hostile targets in order to initiate either defensive or offensive action. As a core capability, it seeks to provide the persistence necessary to deny an adversary the initiative and leverages the speed, range, and viewpoint of airpower to identify hostile intent and enable decision superiority by the ACC. Data collected by RCAF sensors also plays a pivotal role in support to joint operations and to the civil power by feeding information to joint analysts and other government agencies as part of the overall intelligence and situational awareness effort.

Air Mobility. Air mobility contributes to the CAF's overall strategic mobility by providing the capability to rapidly deploy and move its forces, equipment, and supplies with little notice around the globe and across the spectrum of conflict. Air mobility is the capability of conducting airlift and air-to-air refuelling (AAR) roles. Airlift and AAR missions are integral to the success of most air operations and joint operations. Airlift is critical for deployment, redeployment, sustainment, and tactical mobility, while AAR is critical to enable and sustain intense air operations.³

Support to Joint Operations and the Civil Power. All air forces provide support to joint operations; however, the RCAF, as an integrated member of the CAF, is also responsible for the provision of organic airpower to the Navy, Army, SOF, and Canadian Joint Operations Command (CJOC). Because the provision of airpower is critical to the other elements' success, our support to joint operations and the civil power is a core capability that the RCAF must provide. This same logic holds true for the intelligence community since air assets collect vital data to help them

3 B-GA-404-000/FP-001, *Canadian Forces Aerospace Move Doctrine*, November 2011, 13, http://www.rcaf-arc.forces.gc.ca/cfawc/CDD/Doctrine/Pubs/Operational/404_Series/B-GA-404-000-FP-001.pdf (accessed May 25, 2012).

build the joint situational awareness that leads to decision superiority.⁴ Support to the civil power recognizes the fundamental responsibility of the CAF to help secure Canadians at home and abroad. The means of providing search and rescue (SAR), disaster and crisis response, and humanitarian assistance are examples of how air force assets can be used to provide the government with this capability.

With respect to the reach, persistence, early warning, and response (counter-air) requirements, the aim must be to detect, deter, and, if necessary, defeat incoming threats before any incursion of Canada's exclusive economic zone. This aspirational objective must be the airpower goal in order to assure Canada's sovereign responsibility and to address any threat to Canadian economic and commercial freedom of action.

Identifying our core capabilities and attributes is necessary so that we can focus institutional effort on those key responsibilities and processes that the RCAF must conduct in order to ensure our airmen are trained, equipped, and organized to deliver relevant airpower effects. Identifying capability gaps and desired attributes is an example of this activity and is necessary to enable the Air Force to support joint FD and internal transformation into the force described in our vision.

Institutional Responsibilities and Processes

The Comd RCAF is the Chief of the Defence Staff's (CDS') airpower expert charged with generating the capabilities needed to prevail in current operations and ensuring that the

RCAF, as an institution, is structured to provide the personnel, equipment, training, and support needed to meet tomorrow's challenges. This effort to prevail today (deliver airpower) and prepare for the future (develop airpower) can best be described as the RCAF's *institutional responsibilities* and explains why the Air Force exists as a discrete institution. The third responsibility, performance measurement, fulfills the Comd RCAF's corporate duty to ensure that we effectively achieve the airpower mission in an efficient manner. The Air Force institutional responsibilities are to:

- a. deliver airpower today;
- b. develop airpower for tomorrow; and
- c. carry out performance measurement and auditing to achieve the mission in an effective and efficient manner.

The Air Force works within the Chief of Force Development (CFD) framework to identify capability gaps and to develop the airpower needed to close them and contribute to winning the joint fight. Identifying the required core capabilities and attributes is part of this effort. Finding *potential* capabilities and turning them into the *tangible* combat power needed to accomplish our core capabilities is one of the RCAF's key institutional responsibilities.⁵

Foundational elements, detailed in the next chapter, underpin our ability to generate airpower effects. Weak foundational elements will eventually lead to degradation of one or more core capabilities and roles, therefore constraining our ability to achieve our mission. Reinvestment in a weakened foundation can restore or improve our core capabilities, but only if we have the established processes necessary to fulfill our institutional responsibilities.

⁴ "Decision superiority" is the competitive advantage enabled by ongoing situational awareness that ensures the implementation of more effective and efficient actions than an adversary. B-GA-400, 37.

⁵ The CAF Transformation Team's "Report on Transformation 2011" developed a "5F model" to produce an activity-based model to capture the effort needed to produce operational effects, rather than focus on organizational process and output. The model offers force management, FD, FG, force support, and force employment (FE) as the pan-CAF activities that lead to effects.

Core Processes

In order to fulfill our institutional responsibilities, the RCAF must have the enabling processes that develop the people and structures essential for mission execution. It is the output of these processes that is the primary focus of the vectors and strategic objectives in the next chapter.

These core processes are:

- a. command and deliver airpower in joint warfare;
- b. force generate CAF airpower;⁶
- c. assure and assess force readiness;
- d. carry out professional development and training of air personnel;
- e. develop and innovate airpower; and
- f. manage resources (with a particular focus on our human dimension).

Command and Deliver Airpower

An extension of the need to develop professional airmen is our ability to produce leaders who are prepared and equipped for *command at the tactical, operational, and strategic levels*. These airmen build on their tactical and operational expertise to articulate the need for CAF airpower; are capable of employing airpower in complex situations; act as air expeditionary wing commanders, air component commanders, and airspace control authorities; develop air campaigns; and, ultimately, command a joint task force and the RCAF itself. The key to command in the airpower context is the effective delivery of RCAF airpower in a joint, coalition, and integrated environment as the lead airpower planner and, potentially, with an airspace control authority function. The Air Force must

continue to challenge, mentor, and support those leaders with the potential to command.

Force Generate Canadian Armed Forces Airpower

The best-trained airmen and airwomen can do nothing for the CAF and their nation if there are no means to turn their expertise into airpower effects. Generating airpower is a complex and intense proposition that demands many cross-department and industry-wide resources spanning many years of intense effort and coordination. No engine can be changed, fuel pumped, or sortie flown without the synchronization and orchestration of diverse logistics, engineering, legal, financial, and technical support activities.

Airpower FG is all about taking the individual airman and airwoman, and developing the right collective mix of airpower capabilities for the operations. The Air Force must remain adept at efficiently drawing the right airpower capabilities together to meet the joint airpower needs. The success of the RCAF and the application of Canadian airpower will be judged by our ability to generate effective forces quickly and efficiently.

Assure and Assess Force Readiness

Readiness and joint training are the “coin of the realm” going forward, and there will be a concerted effort to balance an effective force with the efficiencies expected from an integrated CAF. The Air Force will therefore need to develop a readiness framework and joint training process, including means of evaluation, to ensure our core roles can be executed at the level expected by the government and the other elements in the CAF.

Professional Development and Training of Air Personnel

Primary among the core processes is our ability to develop professional airmen.

⁶ The B-GA-400 (page 50 sidebar) defines the Generate function to include “the development of capabilities to the point of being ready to be operationally employed...” The B-GA-400 breaks down the Generate function to include force development, force readiness (recruit, educate, train, and equip), and loss prevention. In this context, the definition is more constrained to focus the RCAF on the need to take airpower readiness capabilities through the final stage of preparation before force employment.

Without a collective appreciation and understanding of the tenets of airpower and their strengths and weaknesses, we cannot possibly prevail in our mission. Individual training and the continued professional development of expert airmen is a core competency that we must continue to provide and that RCAF personnel must strive to achieve.

Develop and Innovate Airpower

Our ability to develop and evolve the Air Force has become increasingly important for the short- and long-term success of airpower. The ability to identify and develop new concepts, doctrine, tactics, synthetic training opportunities, and apply lessons observed through current operations are as much a part of FD as procurement of new platforms and equipment. In today's world, the speed of innovation and technological developments means that the risks of falling behind are greater than ever. As military and security forces face constraints on their overall size and budgets, the importance of technology evaluation, insertion, and exploitation becomes ever greater for the smaller force to achieve the required effects and to ensure prudent investment of limited funds. Technological innovation, if rapidly exploited, can provide air forces with a tactical advantage over an adversary.

Resource Management

Finally, our ability to efficiently manage our resources, both personnel and financial, is a core process that maximizes return on investment and enables institutional trust from our members, the public, and the government. The RCAF must continue to aspire to more austere use of important resources while optimizing output to achieve both institutional and operational demands. The RCAF must develop a system that allows for success in justifying and acquiring resources, directly attributes resources to output demands, efficiently and flexibly transfers resources to meet non-forecast demands, and effectively measures performance against the strategic vision.

Human Resource Management

While there will always be attrition of personnel, our ability to retain highly trained individuals and to compete for new talent is fundamental to long-term viability. Recent experience has shown how difficult it can be to recover from excessive attrition and how this impacts force development. Although the Air Force does not recruit directly, we can influence a new recruit's choice by remaining visible in all corners, and by showcasing the unique challenges and rewards of serving the nation in the air environment. Once wearing our uniform, retaining the individual rests on our ability to build and sustain a relationship that recognizes and values service.

Fundamental to this relationship is the need for RCAF leadership at all levels to optimize the human dimension of Canadian airpower by efficiently managing our people. This requires a command focus on management process, training, mentorship, career management, moral and ethical development, and discipline. Further, commanders must look beyond the needs of the individual RCAF member to consider the institutional impact on the broader families. While the needs of the service always remain paramount, the impact of service life on our families must remain a key command consideration. Further, recognition of support must extend beyond the RCAF and CAF to include the local community and, in more general terms, the nation. Leaders at all levels must work to ensure their personnel know how vital and honourable service is to the nation and give recognition where due. Squadron, wing and divisional commanders must endeavour to establish and foster relationships within the broader community, locally and nationally.

Having provided a comprehensive understanding of the airpower core capabilities and institutional responsibilities the RCAF must execute, and of the core functions that will enable it to do so, the next chapter can be described as the flight plan depicting how we intend to get to the target Air Force.

Chapter 4

RCAF Vision and Vectors

RCAF Vision

An agile and integrated air force with the reach and power essential for CAF operations.

What does the Royal Canadian Air Force (RCAF) need to do to meet the ongoing and future challenges? Clearly, it must be prepared to respond quickly when called, while meeting enduring Canadian defence needs and coalition commitments, with an awareness that its resources are limited and that maximizing its resources and capabilities means it must work effectively across its own communities as well as with the rest of the Canadian Armed Forces (CAF), the government, and allies. To those ends, the RCAF as an institution must be agile and integrated, with sufficient reach and power to remain a valuable instrument of Canadian policy. These raw attributes are articulated in the Air Force vision; their substance and meaning as airpower output will be made manifest through the steer provided in the strategic objectives and the consequent plans and annual directives. We will ensure we are meeting those objectives and that they are the right ones through ongoing analysis of the lessons learned from past operations, and the testing of new concepts and technologies against possible future requirements.

The RCAF will steer toward its vision, directed and bound by four strategic vectors (agile, integrated, reach, and power). The vectors provide both direction (a specific bearing towards the vision) and magnitude (level of ambition) to guide the capability development that is necessary for the Air Force to remain relevant and responsive for the remainder of the 21st century. In this edition, the level of ambition has been devised by setting strategic objectives against each vector, thereby allowing a practical means of measuring progress towards the vision. It is important to note that the vectors are not prioritized. Progress along all vectors is required as the Air Force evolves towards its vision and, ultimately, to enable CAF transformation to proceed at the desired pace. Figure 12 provides a graphical depiction of the vision-vector-objective construct.

Each vector will be progressed by the achievement of supporting strategic objectives and subsequent tasks, as assigned and managed through the *Campaign Plan (CP)*. Major adjustments of the vision, vectors, and strategic objectives will result from the introduction

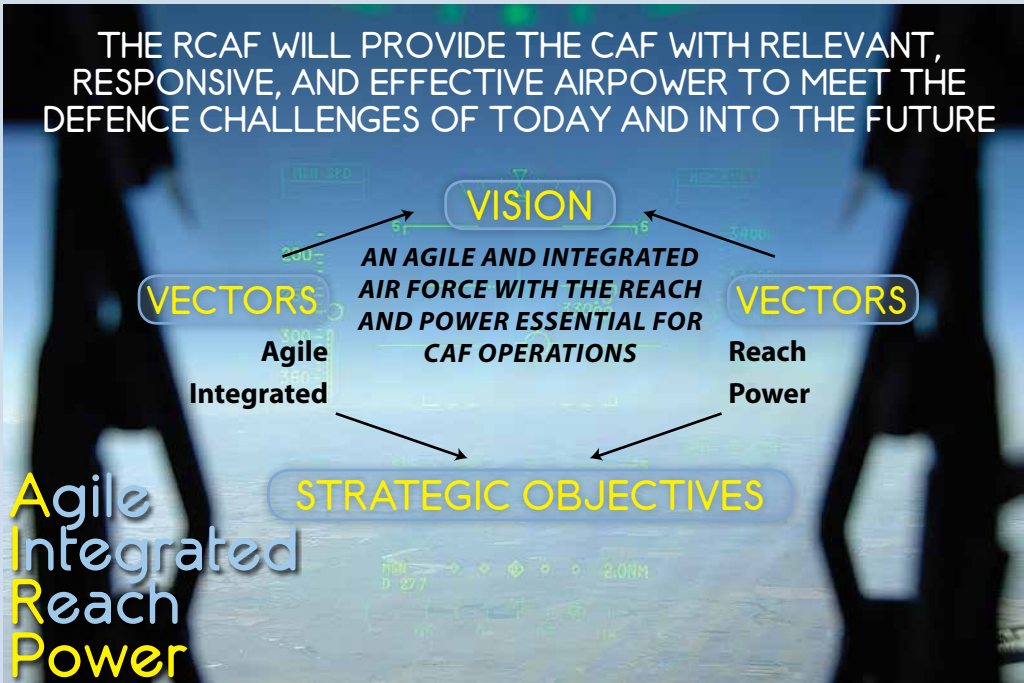


Figure 12. Vision – Vectors – Strategic Objectives Overview

of new warfighting ideas or systems (for example, validated concepts or new technologies) as reflected in the analysis and guidance provided by CAF and Air Force concept development work, identification of capability requirements, the emergence of a new defence threat, or a new policy direction from government or senior leadership.

Vectors

Vector 1: Agile

Intent. The RCAF will be responsive, resilient, and adaptable and will promote those who can thrive in this environment.

Description. *Agile* has an organizational, operational, and individual meaning. The Air Force is often required to respond quickly, but robustly and effectively. The organization must have processes and structures that obtain, analyse, and

use information quickly, while ensuring that Air Force personnel have the agility of mind to adapt and endure. Individuals will need to share the characteristics with the organization. Air Force personnel will have the ability to adapt to a rapidly changing operating and strategic environment and to maximize the effects and capabilities from the resources at their disposal to achieve mission success.

Strategic Objectives – Agile

Learning Organization:

- a. **Intent.** The Air Force will continue with its efforts to better identify, analyse, and integrate lessons learned from the tactical through to the strategic level, to better encourage and reward innovation, to better collect and manage knowledge and corporate memory, and to promote formal and informal learning and professional development.

- b. **Description.** A learning organization is one that can modify its behaviour through the practice of adaptive team learning, underpinned by such processes as lessons learned, after-action reviews, and knowledge collection and management. A learning organization also “facilitates the learning of all its members and continuously transforms itself.”¹ The Department of National Defence (DND) is a self-described learning organization. The Air Force will follow that model, building on the areas where it already excels as a learning organization—the Air Force Flight Safety programme, for instance—and develop pan-Air Force knowledge management, performance measurement, and lessons learned systems, while ensuring its airmen are prepared to act and lead, whether at the operational or at the strategic level.

Review Force Readiness:

- a. **Intent.** The Air Force will develop tools to better audit, assess, and demonstrate our routine force (and mission) readiness posture.
- b. **Description.** Force readiness is the foundation necessary to execute airpower. The aim of readiness as a foundation is to strike an acceptable balance between preparedness for a generic war and cost—a balance between efficiency and effectiveness. Readiness levels provide a baseline capability requirement to meet the potential airpower demands under the *Canada First* Defence Strategy (CFDS). The Air Force requires a system to more effectively review standards against readiness levels as well as an ability to independently evaluate readiness levels.
- Enhance Force Generation:**
- a. **Intent.** The Air Force will pursue more cost-effective, efficient, and independent means of organizing tasks and priorities, commanding and controlling systems, testing capabilities, and providing Commander Royal Canadian Air Force (Comd RCAF) with the capability to certify them ready and airworthy in all areas prior to declaring the force operationally ready.
- b. **Description.** The Air Force will begin a comprehensive review of its force generation (FG) processes and concepts to ensure that the transition from mission readiness to force generating for an actual operation is rapid yet effective. The readiness foundation is only step one in what is arguably a two-step preparedness FG concept. The CAF readiness construct is based on strategic analysis of less than clear threats and an ever-changing strategic and global environment. While being prepared for a possible set of eventualities provides a foundation for operational contingencies, when an identified threat arises requiring the employment of airpower, we enter a phase of FG. An FG construct takes the disparate components of the fighting force ready for “a” war to the next level in being prepared specifically for “the” war at hand (in other words, operational readiness²). Air Force personnel must also be committed to developing an extensive knowledge of airpower doctrine and joint operations as well as an understanding of the importance of nurturing airpower expertise within a CAF culture, in order to be able to adapt quickly to emerging FG requirements.

1 John Burgoyne, Mike Pedler and Tom Boyde, *The Learning Company: A Strategy For Sustainable Development* (London: McGraw-Hill Book Company, 1991), 1.

2 “The capability of a unit/formation, ship, weapon system or equipment to perform the missions or functions for which it is organized or designed. Note: May be used in a general sense or to express a level or degree of readiness.” *Defence Terminology Bank* (DTB) record 4983, <http://terminology.mil.ca/term-eng.asp> (accessed March 13, 2012).

Employ a Strategic Guidance Framework:

- a. **Intent.** The Air Force has developed a holistic and systematic strategic guidance framework to provide the Comd RCAF with the tools to steer and direct the RCAF, set objectives, allocate ways and means as well as review and audit implementation, while measuring progress and refreshing periodically.
- b. **Description.** The RCAF has recently developed a suite of tools to provide direction, prioritize effort, and shape analysis. These documents and tools have been developed and are now being implemented. They include this document, the *Campaign Plan*, and the *Future Concepts Directive*. The Comd RCAF must have the tools to communicate to and direct the organization to meet the CAF's requirements for airpower and to provide the Chief of the Defence Staff (CDS) with airpower advice as required. Clear and unambiguous direction from the strategic level helps to prioritize and focus effort of the operational and tactical levels in order to achieve results outside their normal area of responsibility (AOR). Refreshing these enablers, and developing new governance structures and processes where required, underpinned by key principles of accountability and authority, will enable the Comd RCAF to generate and deliver airpower and airpower expertise where needed, as well as provide depth to minimize the risks from turnover and any retrograde of corporate memory due to ongoing demographic challenges.³

Develop Knowledge Management Standards and Practices:

- a. **Intent.** The Air Staff will analyse and support the introduction of new "processes and practices to identify and capture knowledge, know-how, expertise, and other intellectual capital, and to make [that] knowledge available for transfer and reuse across the organization."⁴
- b. **Description.** Knowledge management underpins organizational and individual agility as well as accountable governance, management, and learning. The knowledge management system to be developed by the RCAF will align with DND and the CAF knowledge management policy and practice whereby the system is described as comprising a "range of practices used by organizations to identify, create, represent, and distribute knowledge for reuse, awareness and learning across organizations."⁵

Vector 2: Integrated

Intent. The Air Force will maintain and advance interoperability and pursue full-networked capability to ensure Canadian airpower remains a key enabler to the success of CAF operations.

Description. "Integrated CF operations" refers, first, to the "full manifestation of interoperability"⁶ but goes further. Interoperability is achieved by similar doctrine, joint exercises, and a network of systems that have the ability to share information. Interoperability between elements of two or more CAF environments is critical, but interoperability within the RCAF is the necessary start point

3 Based on B-GJ-005-000/FP-001, Canadian Forces Joint Publication (CFJP) 01, *Canadian Military Doctrine* (CDS, Canadian Forces Experimentation Centre [CFEC], April, 2009), 2-3, http://dsp-psd.pwgsc.gc.ca/collection_2010/forces/D2-252-2009-eng.pdf (accessed March 13, 2012); A-PA-005-000/AP-006, *Leadership in the Canadian Forces: Leading the Institution* (Canadian Defence Academy [CDA] – Canadian Forces Leadership Institute [CFLI], 2007), <http://www.cda-acd.forces.gc.ca/cfli-ilfc/doc/Leading%20the%20Institution%20-%20English.pdf> (accessed November 29, 2011).

4 DND, *What is Knowledge Management?* <http://vcds.mil.ca/sites/page-eng.asp?page=3974> (accessed March 13, 2012).

5 Ibid.

6 DND, CDS, *Canadian Forces Integrated Operating Concept*, Draft Version 01, 18 March 2005, 12, <http://navy.mil.ca/english/asstcms-OLD/dmpor/Docs/Coastal/Integrated%20Operating%20Concept%20v1%2018%20Mar%2005.pdf> (accessed March 13, 2012).

and must also extend to interaction with any Canadian partner organization, agency, or allies involved in security activities influencing the conduct and results of military operations.⁷ However, it is also people collaborating with people that provides the level of networking required to achieve full-spectrum situational awareness. This will include traditional and non-traditional military activities being carried out collaboratively within the whole-of-government (WoG) / joint, interagency, multinational and public (JIMP) approach.

Strategic Objectives – Integrated Be Interoperable:

- a. **Intent.** The Air Force must become an integrated force. Lessons identified from air wing operations in Afghanistan require that the RCAF continue its transition to an integrated force in and of itself, with a focus on air-to-air integration, while concurrently pursuing measures to improve integration with the rest of the CAF, and interoperability with the United States (US) and other North Atlantic Treaty Organization (NATO) partners. The Air Force will also engage with other air forces to ensure common standards, to exchange lessons, and to grow an understanding of airpower expertise. Air Force engagements with other organizations and air forces, as well as agencies and departments, should be pursued in a systematic manner, founded in government and CAF policy guidance, expanding links based on common hemispheric defence challenges, and aligned with government regional initiatives and priorities.
- b. **Description.** The pursuit of interoperability within the RCAF and with the Army, Navy, and special operations forces (SOF) helps ensure the success of integrated CAF operations. The pursuit of full RCAF and CAF integration and interoperability with allies reflects both Canada's traditional, multilateral

approach to employing military power in fulfillment of defence policy roles and the broader requirements of integration with a range of security partners explicit in achieving national objectives in a complex security environment.

Advance the JIMP Concept:

- a. **Intent.** The Air Force will pursue the capability to work with and, where necessary, lead JIMP partners across the spectrum of defence and security issues.
- b. **Description.** The Air Force must be prepared to work with a wide variety of security partners as part of an integrated CAF and WoG approach for humanitarian and conflict operations. Canada's Arctic is an area where the Air Force can support the CAF in its efforts to build better links with government security partners while actively meeting defence priorities. For example, the Air Force can focus FG activity in those geographic areas of most strategic value to Canada, most notably by increasing presence in the Arctic. The final objective is the ability to "plug and play" with, first, other elements of the CAF and, subsequently, with other government departments and, where practical, non-government organizations and collaborative agencies. Due to its inherent logistical capabilities and significant operational experience, the CAF will be expected to continue to play a leadership role in the support of domestic operations.

Enhance Collaboration through New Technology and Concepts:

- c. **Intent.** The Air Force, supported by science and technology (S&T) and industry, will maximize available technology and investigate new technologies, concepts, and processes to ensure that full advantage is gained from the expertise and experience resident in the Air Force and the CAF.

7 Ibid.

- d. **Description.** The RCAF will develop the means to better track and use technology to ensure it remains on the cutting edge of technological developments. The proposed strategic guidance framework has the potential to provide earlier visibility to domestic industry of future capability initiatives. Earlier visibility into RCAF concept development and capability gaps would facilitate industry planning and better enable innovative and timely domestic proposals. Similarly, better collaborative tools could support routine taskings and make virtual teams more effective and efficient.

Be Networked:

- a. **Intent.** A *networked* Air Force will achieve complete connectivity across its organization, and work with the CAF to ensure the same. It will build on the human dimension of connectivity by leveraging the physical infrastructure and by supporting the right mix of enhanced skills and organizational relationships.
- b. **Description.** Success in future operations will be reliant upon being networked with many different organizations, secure and non-secure communication systems, platforms, and people through data-links, common or user-defined operating pictures, combat identification, and air traffic management systems. While technologically advanced aircraft—manned or unmanned—will continue to play an important role in the future, they will need to be networked with a greater number and variety of systems, and, ultimately, people, to ensure that operations are successful. This will involve connecting sensors, operators, and decision makers with networks to communicate and share quality real-time data for effective and timely decision

making in operations. Equally important, the Air Force will pursue the means and evaluate the ways to increasingly shorten sensor-to-shooter decision processes. The Air Force network architecture and processes must also integrate seamlessly with the CAF's.

Engage with other Airpower Practitioners:

- a. **Intent.** The RCAF will engage with the air forces, armies, and navies of allied and non-allied nations to enhance airpower knowledge and to support the CAF's Global Engagement Strategy.⁸
- b. **Description.** The Global Engagement Strategy is a departmental initiative guiding potential global engagement opportunities using existing resources. It provides a framework and guidance for conduct of the *Defence Team*⁹ in international defence relations and is designed to bring coherence to international defence diplomacy by establishing priorities for engagement. The Air Force is consequently developing its own mechanism to guide our own global engagement strategy as well as potential performance measurements.

Connect with Canadians:

- a. **Intent.** The RCAF will engage Canadians from the national to the local level, ensuring that they understand the Air Force's roles and contributions.
- b. **Description.** The Air Force, as an integrated element of the CAF, is an instrument of military power for Canada and Canadians. This responsibility remains at the core of its relevance to Canadians. The Air Force also maintains a moral contract with the people of Canada: we look to recruit the nation's finest youth; we are called on to exercise moral

8 DM (Deputy Minister) / CDS Planning Directive for DND/CF Global Engagement, 22 July 2011, <http://dmcs-prk.mil.ca/dmcs/FilesO/DMCS90632.PDF> (accessed March 13, 2012); 3000-1 (D Air SP) RCAF Directive – Global Engagement Activities, 19 September 2011, <http://vcds.mil.ca/cas/dmcs2005/FilesO/DMCS27781.pdf> (accessed March 13, 2012).

9 CFDS, 3.

restraint and leadership in consideration of placing these exceptional people in harm's way; and, we have a moral responsibility to return these airmen to society as better citizens than when first recruited. The demands of this moral contract require the Air Force to remain intrinsically engaged with the people of Canada. Communicating and examining the Air Force's relevance is one aspect of the engagement strategy. Promoting the individuals that make up the Air Force and their roles and responsibilities as members of Canadian society is equally important. As part of the CAF approach to connecting with Canadians through participation in community and local activities, the Air Force will also create strategies for enhancing the contribution of its people in the areas surrounding its wings and bases.

Be a Steward of Airpower:

- a. **Intent.** The Air Force will demonstrate its relevance to the CAF and Canadians through its stewardship and development of airpower, guarding the RCAF's legacy and heritage, and responsibly using its resources—personnel as well as financial.
- b. **Description.** Commander RCAF is the steward of Canadian airpower and airpower expertise in Canada. Underpinning the stewardship of airpower is both an understanding of our history and heritage as well as the development of airpower expertise and experts. History and heritage are strategic instruments, and we will take positive steps to ensure that both are developed and available for our collective benefit, and as a legacy to pass on to those who follow. The Air Force must also mobilize and employ academic and public interest in airpower issues by elevating airpower awareness for Canadians, through recruitment activities, by reflecting Canadians and their concerns, and by promoting interest in airpower issues through youth organizations

like the cadets. A primary example of these initiatives is the biennial Aerospace Power Forum, the goal of which is to examine airpower issues and topics of relevance to Canada, the CAF, and the Air Force.

Vector 3: Reach

Intent. While the Defence of Canada is the RCAF's primary mission, there remains a requirement to achieve a robust expeditionary capability for use in both domestic and international operations. A solid expeditionary capacity is required to operate within Canada to meet the challenges of this country's vast expanse and often hostile (climate, terrain and remoteness) environment. Therefore, the RCAF will continue to transition into an expeditionary force capable of applying its core airpower capabilities at home and around the globe.

Description. Reach enables the Air Force (and the CAF) as a national instrument, allowing it to project power in pursuit of national interests across a spectrum of operations and missions. The Air Force is ideally suited to enable the CAF as a rapid responder, providing critical early-response capabilities. We want to guard the gains we have made in strategic airlift as an enabler of force projection, and improve the joint aspect of airlift, and ensure the Air Force can go on short notice in Canada or abroad wherever and whenever the government requires.

Strategic Objectives – Reach Develop Full Domestic Reach Capability:

- a. **Intent.** The Air Force will develop the capabilities to operate across the expanse of the country, including the Arctic, and allow power projection to the extremes of Canada's sovereignty and approaches.
- b. **Description.** The achievement of this objective requires the examination and development of a range of capability requirements, including the enabling of search and rescue (SAR)

and domestic crisis response, full control of North American airspace and maritime approaches in conjunction with our American allies through the North American Aerospace Defence Command (NORAD), and a military presence anywhere within our borders. In particular, we must be in a position to assist Canadians under duress wherever they may be across Canada. This response ability can also act as a means for the government to pursue bilateral agreements that enhance our collective security and to fulfill international obligations. For example, being able to provide SAR capabilities in the Arctic and far offshore enables us to expect reciprocal service for Canadians in distress in another nation's AOR.

Better Integrate RCAF Airpower to Enhance¹⁰ Canadian Armed Forces' Expeditionary Capacity:

- a. **Intent.** The Air Force will continue its pursuit of a comprehensive expeditionary capability to enable the rapid and persistent delivery of national military power capable of defeating threats in North America and contributing to threat deterrence abroad.
- b. **Description.** Canada's Air Force is tasked with domestic and international responsibilities that place a high premium on a rapid and robust response to crises and emergencies; this is unlikely to change in the future. The Air Force must be capable of deploying to prepared and unprepared as well as secured and unsecured locations across the length and breadth of Canada and around the globe and sustaining these operations at the intensity required by our government.

Enhance Reach to Assert Control:

- a. **Intent.** The Air Force will enable and contribute to the development of the CAF's wide-area and focal-area sovereign intelligence, surveillance and reconnaissance (ISR) capability.
- b. **Description.** An Air Force capability stocktaking programme with the development of a related strategy will be a key step towards developing a holistic CAF capability in this regard, in particular in determining what the Air Force needs to pursue in order to meet our sovereign responsibilities. This includes assessing and contributing to capability requirements by facilitating persistent surveillance, employing layered ISR systems, applying effective data fusion, enhancing supporting logistics systems, and optimizing command and control (C2) and cueing mechanisms.

Vector 4: Power

Intent. The RCAF will contribute to control of the air, helping to maintain Allied air superiority whenever and wherever the CAF is deployed; maintain the ability to provide close support and surveillance for maritime, land, and SOF operations; deny any enemy the ability to operate in our air, land, and maritime space; and contribute to the maintenance of Canada's economic lifelines.

Description. *Air Force Vectors* applies only to the military airpower component except in areas where cooperation and/or integrated operations with the civilian component are implicit. Military power is the sum of means: personnel, materiel and ways (strategy, tactics, leadership, doctrine, organization, and purpose). Military power has conceptual, physical, and moral components.¹¹

10 "Enhance" in this context is intended to mean better utilization of the available personnel/airpower assets.

11 The current vogue is to use "capability" rather than "power"; others use the term "force." Irrespective of the terminology, all analysts suggest it is more than the sum of personnel and material, and therefore not just an exercise in counting. See Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton, NJ: Princeton University Press, 2006), 2–7; Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (NY: Random House, 2008), 241–43. Current Air Force doctrine defines *aerospace power* as "[t]he element of military power that is applied within or from the air and space environments to achieve effects above, on and below the surface of the Earth." DTB record 34078. See also B-GA-400, 26; B-GJ-005-000/FP-001, 2–3.

Current Air Force doctrine defines *airpower* in the context of air and space environments and suggests that it is that component of military power applied within or from the air and space environments to achieve effects above, on, and below the surface of the Earth. The Air Force uses space—like the other environments, but its responsibilities are limited to the generation of airpower and airpower expertise.

Strategic Objectives – Power Pursue Multirole Platforms:

- a. **Intent.** The Air Force will continue to pursue the operational advantages and cost efficiencies afforded by multi-role platforms, crews, and weapons. This objective will be enabled by periodic technology reviews, lessons learned analysis, concept development, and doctrine development.
- b. **Description.** Canada's armed forces are required to be multi-purpose to provide the Canadian government with a range of options to achieve national ends. A multi-purpose force is capable enough to meet a range of threats, delivering kinetic and non-kinetic capabilities, and flexible enough to operate with allies or probable coalition partners. The RCAF is committed to maintaining combat-effective, multi-purpose airpower;¹² however, it is also committed to efficiencies which effectively limit the number of fleets it can operate. The two requirements shape decisions regarding platforms and weapons procurement, suggesting the importance of multi-role platforms able to meet a variety of contingencies.

Be Combat Effective:

- a. **Intent.** The Air Force will be trained, equipped, and ready to create effects that enhance the CAF's combat power.

12 For our purpose, a "multi-purpose" Air Force can be identified by the following characteristics: a range of specialist modern airpower assets, weapons, and aerospace services which are designed to meet specific national objectives and goals; specifically designed to work in conjunction with a coalition or with a major power's air force; and access to a range of national aerospace services, which are designed to work within an international consortia of aerospace companies. Combat capability remains a distinguishing feature of a multi-purpose air force.

13 A combat operation is defined as a "military operation where the use or threatened use of force, including lethal force, is essential to impose will on an opponent or to accomplish a mission." DTB record 21754.

Force projection and force preservation will be integral elements of combat capability.

- b. **Description.** Combat effectiveness in all airpower functions is essential for the delivery of relevant airpower. Equally important are the Air Force's abilities to create kinetic and non-kinetic effects during combat operations¹³ and to conduct force projection and force preservation operations and missions. Combat effectiveness requires a solid foundation of readiness, people, platforms, leadership, and supporting architecture—a foundation that will allow the Air Force to be more than simply capable of creating kinetic and non-kinetic effects. Contemporary operations increasingly rely on the ability to precisely apply force, or the threat of force, to effectively counter defence threats, whether in the form of bases supporting known terrorists or of an adversary equipped with modern air defence systems and platforms. The Air Force must be adept at creating or contributing the desired power in both physical and moral domains via capabilities such as precision weaponry, stealth, and manoeuvrability.

Be Capability Focused:

- a. **Intent.** The Air Force must continue to develop a planning ability that is based on capabilities; is focused on a production and management system that balances sustaining the current force; and responds to immediate requirements with the imperative to change and adapt as a result of validated empirical study, enduring defence roles, and operational lessons learned.

A key requirement is a sustainable and empirically sound Air Force concept development process.

- b. **Description.** Capability-based planning was adopted by the CAF in 2000.¹⁴ It is best defined as: “Planning, under uncertainty, to provide capabilities suitable for a wide range of modern-day challenges and circumstances while working within an economic framework that necessitates choice.”¹⁵ In general, it rests on the assumption that planning for a variety of threats and the production of capabilities produces a force (and an organization) capable of responding to a range of undetermined threats. Capability-based planning is perceived as a corrective to the narrowly focused threat-based (or point) planning that characterized the cold war. It is deemed as the ideal solution to address uncertainty in defence planning, but in part because a key goal of capability-based planning is not just to identify the threats, but also to produce an organization (and personnel) agile enough to adapt quickly to threats, unanticipated in form or intent.¹⁶

Pursue Effects-Focussed Planning:

- a. **Intent.** The Air Force will measure its effectiveness by developing capabilities, planning operations, fulfilling roles, and analysing results based on desired effects, not on platforms.
- b. **Description.** Air Force planners must consider all effects, including intentional, unintentional, positive, negative, and contradictory. The Air Force effects-focused ap-proach views the platform as only one

element of the whole system of systems that makes up an aerospace capability. Furthermore, the increasingly multi-function capability of aerospace platforms will be exploited. For instance, while a fighter aircraft is traditionally employed in the *Act/Shape* aerospace functions, effective exploitation of onboard targeting pods in the “non-traditional” *Sense* function is already evident. Under the right circumstances, fighter aircraft could also be utilized in a *Move* aerospace function, such as high-speed movement of small but critical items during domestic emergencies (e.g., the rapid transport of a suspected biological agent sample to a specialized testing facility, etc.).¹⁷ The focus is on effects achieved, directly or indirectly, through the application of kinetic and non-kinetic instruments of influence, such that effects are cumulative and mutually reinforcing.

Enhance RCAF Force Preservation:

- a. **Intent.** Force protection (FP) and preservation initiatives will include the development of an expanded independent support capability in order to sustain expeditionary operations at deployed operating bases. Active safety programmes and the development of equipment and training, such as electronic warfare capabilities to counter known threats and hazards, will also be keys to minimizing operational losses.
- b. **Description.** Force preservation includes activities to protect personnel and air assets on the ground and in the air, including FP and loss prevention programmes. As airborne

14 The Chief of Force Development (CFD) defines a capability as a “particular ability that contributes to the achievement of a desired effect in a given environment within a specified time and the sustainment of that effect for a designated period. Capability is delivered by an appropriate combination of PRICIE components.” CFD, *Capability Based Planning Handbook*, Version 6.2, December 2010, 34, <http://cfd.mil.ca/CapabilityManagement/Resources/CBP/CBP%20HB/Capability%20Based%20Planning%20Sept%20Ver%206.2%20web%20version.doc> (accessed March 13, 2012).

15 Paul Davis, *Analytic Architecture for Capabilities-Based Planning* (Santa Monica, CA: RAND Corporation, 2002), xi.

16 For an overview of discussion, see Paul Davis and Zalmay Khalilzad, *A Composite Approach to Air Force Planning* (Santa Monica, CA: Rand, 1996), 30–35.

17 B-GA-400, 1.

FP is heavily affected by changing technologies of threat systems, aircraft self-protection systems must be continuously analysed, tested, and validated for effectiveness. Rapid evolution of S&T will be one of the key elements advancing this vector.

Foundational Elements¹⁸

The RCAF's ability to move forward along the vectors will depend on the foundation provided by the Air Force's *people, leadership, airworthiness, technology, and sustainability*. The foundational elements can be equated to the concept of centres of gravity that must be protected as essential to enabling a successful campaign—in this case, the Air Force evolution. In other words, should any one of the foundational elements become weak, it will directly impact our ability to progress along one or more of the vectors and, ultimately, prevent the achievement of our strategic objectives. At any point along the vector, the calculus of these foundational elements has a key role to play in facilitating further progress: enabling, informing, and shaping their implementation. The Air Force of the future is the sum of the interaction between the strategic vectors and the five elements of the foundation on which they are built.

People

Intent. Led by the 2 Canadian Air Division, the Air Force will reinvigorate its professional development and human resource (HR) plans to position both its people and the organization for success.

Versatile and highly skilled personnel are and will continue to be at the core of the Air Force's agility and responsiveness. They must also be committed to develop an extensive knowledge of joint doctrine and JIMP-concept operations, understand and advocate airpower within a CAF culture,

and pursue life-long learning and self-improvement. The intellectual skills of a well-educated, informed, and ethical team of Regular, Reserve, and civilian personnel must be harnessed to develop new operational concepts, exploit new technology and doctrine, capitalize on the capabilities inherent in airpower, and apply initiative and innovation. Above all, our personnel must understand the need to adapt, change, and evolve both individually and collectively. The pace of modern combat operations demands fast adaptive cycles that require a mindset of continuous improvement. We must all develop a culture that accepts ongoing dynamic evolution for continuous improvement as fundamental to the successful application of airpower.

At the heart of all the technology, machinery, and vast amounts of intelligence information, remain the airman and airwoman. Whether designing, operating, maintaining, or delivering the multitude of components of airpower, each of us must steadfastly perform our "Duty With Honour." The CAF military values of duty, loyalty, integrity and courage—coupled with the broader components of the CAF's military ethos—will be no less important than when Flying Officer William Bishop piloted his Nieuport during the Battle of Vimy Ridge. In fact, as our ability grows to strike at great distance with growing lethality and virtual impunity, adherence to our ethos will define the profession's future.

Air Force personnel must be morally, physically, and intellectually fit for combat operations, disciplined; and committed to the primacy of operations.

Leadership

Intent. The Air Force will implement and further develop its plans to identify and nurture effective and ethical leaders with broad CAF-wide experience who encourage

¹⁸ Note that each foundational element has direction to develop a plan.

initiative, ingenuity, and genuine concern for subordinates' welfare through mentorship (formal and informal), and will encourage reflection, open discussion and innovation.¹⁹

Canadian Armed Forces doctrine defines leadership as "directly or indirectly influencing others, by means of formal authority or personal attributes, to act in accordance with one's intent or a shared purpose."²⁰ Increasing levels of complexity and requirements for decision superiority in operations will require analytical, flexible, and creative leaders.²¹ The successful execution of air operations now and in the future will be critically dependent on the leadership abilities of all ranks, and their capacity to reconcile the immediate effect of a decision with broader mission goals (the soldier-diplomat).²² Institutional leaders will be needed to ensure the RCAF continues to transform and evolve to meet the challenges of a complex, volatile, and ambiguous security environment.²³ Our leaders must exemplify the ethos and core values that are the essence of military professionalism. We must develop formal systems to mentor and professionally develop our leaders to this end rather than allow a learning-on-the-job methodology. Furthermore, our leaders must have the education and experience to develop the agility and strategic thinking required to move the organization forward.

Airworthiness

Intent. The RCAF will continue to provide airpower output founded on a robust airworthiness and safety framework.

Airworthiness and safety are related philosophical concepts that underscore all facets of RCAF institutional and operational output. They are practically executed across the

RCAF through a systems approach that governs both the certification and sustained function of airpower systems. While the RCAF is built on a mission first focus, this focus is achieved through the airworthiness and safety philosophy that assures the delivery of Canadian airpower. This airworthiness and safety mantra demands all air personnel understand their role in this systems approach to maintain vigilance to avoid accidents, speak up loudly and confidently when a safety matter is evident, stand by the rules and regulations of the airworthiness system, and work to effectively manage risks to preserve precious Canadian airpower systems and resources. The RCAF approach in this regard recognizes that humans make mistakes and will aggressively learn from these, but the institution has a zero tolerance approach for those that purposefully function outside of the airworthiness and safety framework. The RCAF airworthiness and safety framework requires both an institutional and a cultural commitment to be embraced by all air personnel. This is why airworthiness and safety are presented as foundational elements for the RCAF.

Technology

Intent. The Air Force will foster a culture that is readily accepting of new ideas, concepts, and the associated debate and experimentation required to continually adapt and enhance combat effectiveness. Equally important, the Air Force will focus efforts on those technologies and employment concepts that will provide the best return. This requires cooperation between the S&T community, industry, and the RCAF.

In the hands of highly skilled people and strong leadership, leading-edge technology

19 DND, Comd RCAF, ACO 1000-7, *Air Force Personnel Management – Officers*, 11 August 2004, http://airforce.mil.ca/aco/1/ACO%201000-7_Sep_08E.doc (accessed March 13, 2012). 20 Ibid.; A-PA-005-000/AP-004, *Leadership in the Canadian Forces: Conceptual Foundations* (CDA-CFLI: 2005), <http://www.cda-acd.forces.gc.ca/cfli-ilfc/doc/dndcon-eng.pdf> (accessed November 29, 2011), 3.

21 Ibid., ix.

22 Ibid., xiv.

23 A-PA-005-000/AP-006, ix.

becomes a key force multiplier of airpower. As air forces continue to reduce their overall fleet sizes, the importance of technology identification, validation, insertion, and exploitation becomes increasingly important for the smaller force to achieve the required effects. Anticipating technological impact on force employment (FE) choices is challenging, but over the course of the last century the cost of ignoring it has increased. Testing and validating the implications of new technology through research and development, concept development and experimentation, and operational research are key elements of future success. Being technologically aware and prepared to exploit perhaps “blue-sky” technologies requires a culture that is readily accepting of new ideas, concepts, and the associated debate and experimentation required to continually adapt and enhance combat effectiveness. Such a culture will be able to exploit any potential benefits offered by revolutionary technologies and concepts in military affairs. We should strive to embrace such a culture. Equally important is the need to focus efforts on those technologies and employment concepts that will provide the best return. To enhance cooperation and fully exploit opportunities provided by S&T, it is important that the S&T community understands the requirements of the Air Force and that Air Force planners and operators understand the potential of new and existing technology. The RCAF priorities in these areas will be outlined in a periodic *Air Force Science and Technology (S&T) Implementation Directive*. Dialogue with the S&T community—including Defence Research and Development Canada (DRDC), Assistant Deputy Minister (Materiel) ADM(Mat) / Director General Aerospace Equipment Programme Management (DGAEPM)—as well as developing a means of communicating Air Force requirements to industry will ensure that appropriate technologies are identified, evaluated, and implemented.

Sustainability

Intent. The Comd RCAF’s intent is to build institutional resilience and depth by protecting core values and capabilities and functions while adapting in other areas to ensure continued operational and institutional relevance as a key contributing member of an integrated Defence Team.

Sustainability in the CAF is associated with properly balancing investment in the four capability pillars identified in the *CFDS* (personnel, equipment, readiness, and infrastructure). Gains in effectiveness can be realized by redirecting funds from one pillar, such as infrastructure, into one or more of the other pillars; however, if the force is to be sustainable over the long run, a continual rebalancing effort is required. As we continue our transformation, it is vitally important that the RCAF invests only in its core capabilities and processes and the infrastructure necessary to support them. The concept of sustainability also extends to our ability to field and support successive rotations on deployed operations. This latter requirement calls for the RCAF to further develop our ability to force generate a robust deployable sustainment capability for both the air component and an appropriate contribution to the overall joint sustainment effort.

Chapter 5

Implementation

Air Force Vectors is the capstone product in a series of documents that, together, form the strategy framework guiding Royal Canadian Air Force (RCAF) and Canadian Armed Forces (CAF) airpower development.

Air Force Vectors articulates the airpower output necessary for mission success today (*what* the RCAF needs to do) and targets the kind of airpower needed tomorrow. The *RCAF Campaign Plan* will identify the flight plan needed to bridge the chasm between generating core capabilities today and ensuring a sustainable force for tomorrow (*how* the RCAF will achieve its mission while moving towards its vision). It also provides the Commander RCAF with an extremely agile tool that prioritizes effort under the dynamic strategic environment. Finally, a *Future Concepts Directive* will help explore alternate means of adjusting the flight path en route to the target.

In practice, the RCAF strategy is far more than these three key products alone. The RCAF has been and always will be defined by the people, military and civilian, who serve our nation. Moving forward and building on the history and heritage entrusted to us, we must continue to transform into the air force needed to deliver relevant, responsive, and effective airpower.

Annex A

STRATEGIC DEDUCTIONS from Chapter 2

Enduring Defence Challenge Deductions (EDC):

- EDC 1 – The Royal Canadian Air Force (RCAF) must provide persistent control of the air, across the country, enabled by appropriate surveillance and response capabilities.
- EDC 2 – Strategic air mobility will continue to be required for rapid, comprehensive domestic and international response capability.
- EDC 3 – Collaboration and interoperability with our allies will remain key Canadian airpower attributes.
- EDC 4 – The likelihood of collective actions abroad will require a robust and flexible expeditionary airpower capability.
- EDC 5 – Our maritime approaches will continue to require the provision of surface and sub-surface airpower support, including maritime warning under North American Aerospace Defence Command (NORAD).
- EDC 6 – The RCAF operations in the Canadian Arctic will grow in importance.

Defence and Security Environment Deductions (DSE):

- DSE 1 – Canada will continue to export security to promote prosperity and stability in regions of the world that are poorly governed or that fail to conform to international norms of peace and security. Whole of government effort will be needed, including the discretionary use of force.
- DSE 2 – Expect a requirement for precision strikes, with little collateral damage, and increasingly, non-kinetic options.
- DSE 3 – Real-time intelligence and the capability to process, analyse, and transform it into useable knowledge will be essential.
- DSE 4 – Expect an increasing need to minimize the environmental impact of all RCAF activity.
- DSE 5 – Expect an increasing need to contribute to the Canadian Armed Forces- (CAF-) shared situational awareness to detect anomalies in “patterns of life” in an area of responsibility (AOR).
- DSE 6 – The CAF should plan on a range of capabilities, assuming it might have to contribute to the fight for access, air superiority, or freedom of manoeuvre.

Defence Policy and Military Strategy – Defending Canada Deductions (DC):

- DC 1 – The RCAF will defend Canada through our ability to detect and defeat threats at the earliest opportunity. Consistently demonstrating this ability will serve as deterrence to those seeking to harm our nation. This implies both a networked surveillance and a control capability throughout the nation, including the maritime approaches and the Arctic.
- DC 2 – Search and rescue (SAR) and rapid crisis response will continue to be the hallmark of our commitment to excellence at home. Increasing accessibility and seasonal activity in the Arctic may require adjustments to the SAR posture, including innovative partnerships and basing options commensurate with the potential needs.
- DC 3 – The RCAF support to joint operations will place increased demands on our expeditionary capability as extended Army, Navy, SOF, and other security partners' Arctic activities increase in frequency and intensity.

Defence Policy and Military Strategy – Defending North America Deductions (DNA):

- DNA 1 – Shared security arrangements with the United States (US) will continue to require close cooperation and integration with United States Air Force (USAF), including doctrine, technology, equipment, and personnel. NORAD will likely remain the primary means to accomplish this mission.
- DNA 2 – Maritime domain awareness will continue to grow in importance.

Defence Policy and Military Strategy – International Peace and Security Deductions (IPS):

- IPS 1 – Full-spectrum expeditionary operations will continue and are expected to employ the full range of Canadian airpower capabilities.
- IPS 2 – The joint and integrated nature of operations will require coordinated training plans and synchronized readiness levels.
- IPS 3 – Cultural intelligence of non-traditional allies will become increasingly relevant as we will work with a growing array of global partners.

Royal Canadian Navy (RCN) Concept Maritime Deductions (RCN):

- RCN 1 – Increasing littoral presence will necessitate new maritime helicopter doctrine and tactics, techniques, and procedures (TTP) to account for different Shield and Act requirements.
- RCN 2 – The “blue water” and littoral aspirations of the Navy mean a continued need for antisubmarine warfare (ASW) and antisurface warfare (ASUW) capabilities.
- RCN 3 – Developments in RCN strike and command capabilities will necessitate network integration with other Air Force strategic and tactical assets, including unmanned aircraft (UA) and joint strike fighters (JSF).
- RCN 4 – The arctic offshore patrol ships (AOPS) capability will increasingly expose our rotary
- RCN 5 – Surveillance and reconnaissance support to Arctic operations will increasingly include support to Navy Arctic operations.

Army Concept Deductions (CA):

- CA 1 – The Army of Tomorrow (AoT) concept for adaptive, dispersed, full-spectrum operations will necessitate new doctrine and TTP for integrating airpower. All of the Canadian airpower roles will be required for the Army to achieve its vision, with an interdependent reliance on mutual command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) capability to detect and target threats.

- CA 2 – The networked AoT will require connectivity with RCAF tactical assets for voice, data, and video exchange.
- CA 3 – The Canadian Forces Arctic Training Centre (CFATC), Arctic Response Company Groups (ARCGs), and a general increase in year-round Army Arctic operations will increase demand for Air Force support, with a resulting demand on training and equipping the Air Force for a persistent Arctic presence.

Special Operations Forces Deductions (SOF):

- SOF 1 – Canada Special Operations Forces Command (CANSOFCOM) has a vested interest in Air Force capabilities, structures, and airpower developments and must therefore be considered in force development (FD).
- SOF 2 – The Griffon helicopter is the primary supporting air asset; therefore, replacement and upgrade changes will need to accommodate CANSOFCOM needs.
- SOF 3 – CANSOFCOM requires connectivity with RCAF tactical assets for voice, data, and video.
- SOF 4 – Air Force doctrine and TTP will need to keep pace with the evolving SOF employment concept.
- SOF 5 – CANSOFCOM requires some integral air capabilities to meet required high readiness needs.

Space Concept Deductions (SP):

- SP 1 – The evolution of space into a discrete environmental domain will necessitate realignment of RCAF human resources (HR) in related to postings, career streams, and post-grad training.
- SP 2 – As a user of space capabilities, the Air Force must ensure training focuses on product exploitation vice the force generation (FG) and FD of capability.
- SP 3 – Our doctrine must align with that produced by the Director of Space Development (D Space D) and account for space as a separate domain.

Cyber Concept Deductions (CY):

- CY 1 – Capability development in the cyber environment will be closely monitored by the RCAF with the objective of learning how to best exploit cyber operations and technology for air operations.
- CY 2 – The RCAF will increase its awareness of the impact of cyber activity on its operations and contribute to CAF cyber operations capability.

Joint Concept Deductions (J):

- J 1 – To ensure a timely operational readiness declaration, it will become increasingly important to synchronize readiness levels and training opportunities with the joint force.
- J 2 – We must develop leaders with broad airpower knowledge capable of air component commander (ACC) functions within the construct of a deployed composite wing.
- J 3 – Commander Royal Canadian Air Force (Comd RCAF) must have the robust readiness evaluation capability to fully exercise his operational readiness (OPRED) responsibilities.
- J 4 – RCAF will require a robust lessons learned process, identifying and implanting lessons from the strategic to tactical levels.

Abbreviations

1 Cdn Air Div	1 Canadian Air Division	D Air SP	Director Air Strategic Plans
1 Cdn Div	1 st Canadian Division	DC	Defending Canada
2 Cdn Air Div	2 Canadian Air Division	DCA	defensive counter-air
		Def Ops	defensive operations
AAR	air-to-air refuelling	DG Space	Director General Space
ABEC	Air Board Executive Council	D Space D	Director of Space Development
ACC	air component commander		
AFDC	Air Force Development Committee	DNA	Defending North America
AFV	<i>Air Force Vectors</i>	DND	Department of National Defence
AOPS	arctic offshore patrol ships	DSE	Defence and Security Environment
AOR	area of responsibility		
AoT	Army of Tomorrow	EDC	Enduring Defence Challenges
APOD	airport of disembarkation		
ARCG	Arctic Response Company Group	FCD	<i>Future Concepts Directive</i>
ASUW	antisurface warfare	FD	force development
ASW	antisubmarine warfare	FE	force employment
		FG	force generation
BG	battle group	FP	force protection
C2	command and control	GC	Government of Canada
C4ISR	command, control, com- munications, computers, intelligence, surveillance and reconnaissance	HELAIRDET	helicopter air detachment
CA	Army Concept	HQ	headquarters
CAF	Canadian Armed Forces	HR	human resources
CANSOFCOM	Canadian Special Operations Forces Command	IMINT	imagery intelligence
CAS	close air support	IPS	International Peace and Security
CCV/LEO II	close combat vehicle / Leopard II tank	ISR	intelligence, surveillance and reconnaissance
CDS	Chief of the Defence Staff		
CFATC	Canadian Forces Arctic Training Centre	J	Joint Concept
CFAWC	Canadian Forces Aerospace Warfare Centre	JFACC	joint force air component commander
CFD	Chief of Force Development	JIMP	joint, interagency, multi- national and public
CFDS	<i>Canada First Defence Strategy</i>	JSF	joint strike fighter
CJTF	combined joint task force		
Comd RCAF	Commander Royal Canadian Air Force	LAV UP	light armoured vehicle upgrade
cont'l	continental	LRSS UP	light armoured vehicle recon- naissance and surveillance system upgrade
coy	company		
CP	<i>Campaign Plan</i>	MIP	Master Implementation Plan
CT	counterterrorism	MUAV	miniature unmanned aerial vehicle
CY	Cyber Concept		

NAI	named area of interest	TacSat	tactical satellite
NATO	North Atlantic Treaty Organization	TAPV	tactical armoured patrol vehicle
NORAD	North American Aerospace Defence Command	TF	task force
		TSL	tactical satellite link
OCA	offensive counter-air operation	TTP	tactics, techniques, and procedures
OMLT	operational mentoring and liaison team	UA	unmanned aircraft
OPRED	operational readiness operations	UN	United Nations
ops		UNCLOS	United Nations Convention on the Law of the Sea
pers	personnel	US	United States
PRT	provincial reconstruction team	USAF	United States Air Force
		USNORTHCOM	United States Northern Command
RAP	recognized air picture		
RCAF	Royal Canadian Air Force	VIP	very important person
RCN	Royal Canadian Navy		
RW	rotary wing	WoG approach	whole-of-government approach
S&T	science and technology	WMD	weapons of mass destruction
SAR	search and rescue		
SIGINT	signals intelligence		
SOF	special operations forces		
SOTF	special operations task forces		
SP	Space Concept		
SPOD	seaport of disembarkation		

Glossary

Note: The definitions contained in this glossary are derived from a number of sources. Where this publication is the definition, no source is indicated. Definitions taken from other sources are indicated in parentheses at the end of each term, utilizing the following abbreviations:

- a. AFS – A-GA-007-000/AF-007 *Air Force Strategy*, 1st ed., Draft, 2007, http://trenton.mil.ca/lodger/CFAWC/Research/ACIF/2009-02-10/Air_Force_Strategy-The_Flight_Plan_for_Canadian_Forces_Aerospace_Power_e.pdf.
- b. B-GA-400 – *Canadian Forces Aerospace Doctrine*, 2nd ed. (B-GA-400-000/FP-000), http://www.rcf-arc.forces.gc.ca/CFAWC/CDD/Doctrine/Pubs/Strategic/B-GA-400/Edition_2/B-GA-400-000-FP-000-Edition_2.pdf.
- c. DTB – *Defence Terminology Bank*, found online at <http://terminology.mil.ca/>.
- d. JP 1-02 – US Joint Pub 1-02, *DOD Dictionary of Military Terms*, http://www.dtic.mil/doctrine/dod_dictionary/.
- e. ODO – *Oxford Dictionaries Online*, <http://oxforddictionaries.com/>.
- f. Termium Plus – *The Government of Canada's terminology and linguistic data bank*, found online at <http://termiumplus.translationbureau.gc.ca/>.
- g. SV – A-AG-007-000/AG-004 *Strategic Vectors*, 2004, http://airforce.mil.ca/dairsp/subjects/sv_e.htm.

Act

The operational function that integrates manoeuvre, firepower and information operations to achieve the desired effects. (DTB record 26165)

adept

Very skilled or proficient at something. (ODO)

aerospace

The environment, meaning the air and space environments, that surrounds the Earth and extends through the air into space from the Earth's surface. (DTB record 34894)

aerospace function

The broad, fundamental and continuing activities of aerospace forces. Aerospace functions can most effectively or solely be performed within or from the aerospace environment. They represent the primary operational capabilities of the Air Force by which it accomplishes the assigned Defence Tasks. (DTB record 34074)

agile

Able to move quickly and easily. (ODO)

air force attribute

A quality or feature regarded as a characteristic or inherent part of an air force.

air mobility

1. The rapid movement of personnel, materiel and forces to and from or within a theatre by air. This includes both airlift and air refuelling. (JP 1-02)
2. The capability of conducting airlift and air-to-air refuelling roles. (DTB record 37284)

air power

The element of military power that is applied within or from the air operating environment to achieve effects above, on and below the surface of the Earth. (DTB record 43951)

battle rhythm

The cyclical process of command and staff activities intended to synchronize operations.

Note: The battle rhythm may include the presentation of situation reports, briefings, and collaborative sessions within the observation-orientation-decision-action loop. (DTB record 43608)

breadth of air force capability

In the past, the term *balanced* was frequently used to describe an air force possessing the entire breadth of aerospace power capability. Today, the term used for such an air force is *full spectrum*. Canada's Air Force is not a *general-purpose air force* because it has no nuclear capability. It is not a *full-spectrum air force* because it does not maintain capability across the breadth of conventional aerospace capabilities. However, it is capable of relatively responsive and rapid power projection, presence, and precision engagement and thus falls within the definition of a *combat capable, multi-purpose, global air force*. As such, it provides the government with the flexibility and freedom of action required to respond to current and future security challenges, something that a niche or constabulary air force could not do.

Full-spectrum general-purpose air forces are those possessing a nuclear capability plus conventional capabilities useable across the entire spectrum of conflict. The United States has such an air force.

Full-spectrum multi-purpose air forces are as described above but without the nuclear capability.

Combat capable multi-purpose air forces are those able to perform, as a minimum, distinct aerospace operations across the spectrum of conflict. Generally, such forces also possess at least some capabilities in other areas (contributing, enabling, and support).

Constabulary air forces are air forces designed to carry out "law-and-order" type missions such as those to counter aerial drug smuggling. Such air forces are not combat capable.

Niche air forces are air forces that maintain specific capabilities for very specific purposes. They have little or no flexibility to respond to events across the spectrum of conflict. (SV)

campaign plan

A plan for a series of related military operations aimed to accomplish a common objective, normally within a given time and space. (DTB record 24576)

capability

The means to carry out a military operation or activity.

Note: Military capabilities are organized into one or more distinct roles to carry out missions. (DTB record 36730)

capability-based planning (CBP)

1. Planning, under certainty, to provide capabilities suitable for a wide range of modern-day challenges and circumstances while working within an economic framework that necessitates choice.

2. A force development process to achieve capability requirements. (DTB record 19928)

categorization of air forces

Air forces can be grouped into one of three categories according to the responsibilities assigned to them by their governments:

- **National** air forces are those whose focus is primarily domestic, with responsibilities for such missions as air sovereignty, air defence, SAR, etc.
- **Regional** air forces are those that, in addition to domestic roles, have responsibilities of a regional nature, deriving from either collective security arrangements or broader national interests.
- **Global** air forces are those that, in addition to domestic and regional responsibilities, are expected by their governments to participate in operations on a global basis. (SV)

centre of gravity (CG/COG)

Characteristics, capabilities, or localities from which a nation, an alliance, a military force or other grouping derives its freedom of action, physical strength or will to fight. (DTB record 324)

coin of the realm

Something regarded as very valuable in a particular sphere.

combat operation

A military operation where the use or threatened use of force, including lethal force, is essential to impose will on an armed opponent or to accomplish a mission. The actual level of force used will be in accordance with specified rules of engagement. (DTB record 21754)

combined

Adjective used to describe activities, operations and organizations, in which elements of more than one nation participate. (DTB record 18750)

competency

The ability to do something successfully or efficiently. (ODO)

control of the air

The degree of influence exerted by friendly forces over the use of airspace relative to the capabilities of an adversary.

Note: The degrees of control of the air are parity, superiority and supremacy.

cultural intelligence

A particular aspect of intelligence that aims to understand how cultural background affects behaviour and decision making, and measures our ability to engage successfully in either an adversarial or a cooperative capacity.

disaster relief

Prompt aid that can be used to alleviate the suffering of disaster victims. Normally, it includes humanitarian services and transportation, and the provision of food, clothing, medicine, beds, and bedding, temporary shelter and housing, the furnishing of medical materiel and medical and technical personnel, and making repairs to essential services. (JP 1-02)

expeditionary operation

The projection of military power over extended lines of communications into a distant operational area to accomplish a specific objective.

Note: In the context of aerospace operations, an expeditionary operation is any operation conducted away from the main operating base. Expeditionary operations may be conducted from a domestic, continental or international location. (DTB record 34907)

force development (FD)

A system of integrated and interdependent processes that identifies necessary changes to existing capability and articulates new capability requirements for the CF. It is driven by changes in policy, actual or projected, changes in the security environment and lessons learned from operations. Force development comprises capability based planning, capability management and capability production. (DTB record 32172)

force employment (FE)

1. At the strategic level, the application of military means in support of strategic objectives.
2. At the operational level, the command, control and sustainment of allocated forces. (DTB record 32173)

force enabler

A capability provided to a force that is essential to mission accomplishment. (DTB record 37304)

force generation (FG)

1. The process of organizing, training and equipping forces for force employment. (DTB record 32171)
2. The process of bringing forces, or part of them, to a state of readiness for operations, by assembling, and organizing personnel, supplies, and materiel. This task includes the training and equipping of forces and the provision of their means of deployment, sustainment and recovery

to meet all current and potential threats. Account must be taken of the need to cater for concurrent operations and timely recuperations. It also embraces the mobilization, regeneration and reconstitution necessary to meet a major conflict, such as general war, and the long-term development of capability to meet changing circumstances.

force multiplier

A capability provided to a force that enhances the probability of success in mission accomplishment. (DTB record 37306)

force planning

The planning conducted by the supported combatant command and its components to determine required force capabilities to accomplish an assigned mission, as well as by the Military Departments, Services, and Service component commands of the combatant commands, to develop forces lists, source and tailor required force capabilities with actual units, identify and resolve shortfalls, and determine the routing and time-phasing of forces into the operational area. (JP 1-02)

force preservation

Activities to protect personnel and air assets on the ground and in the air including force protection and loss prevention programmes.

force projection

The deployment or posturing of military forces to influence a situation. (DTB record 37302)

force protection (FP)

All measures and means to minimize the vulnerability of personnel, facilities, equipment and operations to any threat and in all situations, to preserve freedom of action and the operational effectiveness of the force. (DTB record 23554)

force readiness

The level at which assigned military forces are prepared for immediate deployment.

full-spectrum operations (FSO)

Operations in which forces could be involved [concurrently] in combat, stabilization and humanitarian assistance [i.e., 3-block war] within the same geographical area. (DTB record 43997).

function

Production of the output and/or effects for which a (sub)system or an element thereof is designed. (DTB record 42761)

holistic

Characterized by the belief that the parts of something are intimately interconnected and explicable only by reference to the whole. (ODO)

humanitarian assistance

As part of an operation, the use of available military resources to assist or complement the efforts of responsible civil actors in the operational area or specialized civil humanitarian organizations in fulfilling their primary responsibility to alleviate human suffering. (DTB record 26977)

institutional resilience

The ability of an institution to recover from or adjust to the effects of shock, surprise, damage or misfortune and to continue to effectively accomplish its missions without compromising its values.

integrated operations

Operations that leverage the capabilities and strengths of all elements of the force to achieve desired effects with the minimum effort required. Integrated operations extend beyond traditional joint operations to encompass interdependent and formed integrated units with members from all services as well as any partner organization involved in security activities influencing the conduct and results of military operations. (AFS)

intelligence (int)

The product resulting from the collection, processing, analysis, integration and interpretation of available information concerning foreign states, hostile or potentially hostile forces or elements, geography and social and cultural factors that contribute to the understanding of an actual or potential operating environment.

Note: The term “intelligence” also applies to the activities that result in the product and to the organizations engaged in such activities. (DTB record 738)

interoperability

The ability to act together coherently, effectively and efficiently to achieve common objectives.

Note: Interoperability may be achieved through the compatibility of doctrine, processes and materiel. (DTB record 32228)

joint

Said of activities, operations and organizations in which elements of at least two components participate.

Note: The components [environments] are maritime, land, air and special operations. (DTB record 35248)

kinetic

Said of the use of destructive means to achieve desired effects. (DTB record 43727)

knowledge management (KM)

An integrated systematic approach which when applied to an organization enables the optimal use of timely, accurate and relevant information; it also facilitates knowledge discovery and innovation, fosters the development of a learning organization and enhances understanding by integrating all sources of information, as well as individual and collective knowledge and experience. (DTB record 18879)

littoral

In military operations, a coastal region consisting of the coastal sea areas and that portion of the land that is susceptible to influence or support from the sea. (DTB record 33690)

mission (msn)

A clear, concise statement of the task of the command and its purpose. (DTB record 953)

multilateralism

Multilateralism in international politics means that a state pursues its interests and goals beyond national borders, not alone, but in cooperation and coalition with other states. (Termium Plus)

objective (obj)

A clearly defined and attainable goal for a military operation, for example seizing a terrain feature, neutralizing an adversary's force or capability or achieving some other desired outcome that is essential to a commander's plan and towards which the operation is directed. (DTB record 3119)

optimum

The most favourable situation or level for growth or success. (ODO)

precision attack

A kinetic action to inflict damage or destroy an intended target, while avoiding or minimizing collateral damage.

process (proc)

A predetermined course of events defined by its purpose or by its effect, achieved under given conditions. (DTB record 11497)

reach

The extent to which military power enables a force to be projected.

reconnaissance (RECCE/RECON)

A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. (DTB record 1202)

role

A specific purpose derived from a military capability.

Note: A role may be comprised of a set of specific missions and/or directed by defence policy. (DTB record 43735)

search and rescue (SAR)

The use of aircraft, surface craft, submarines, specialized rescue teams and equipment to search for and rescue personnel in distress on land or at sea. (DTB record 1290)

Sense

The operational function that provides the commander with knowledge.

Note: This function incorporates all capabilities that collect and process data. (DTB record 26167)

Shield

The operational function that protects a force, its capabilities and its freedom of action. (DTB record 26169)

stabilization operations

An overarching term encompassing various military missions, tasks, and activities conducted internationally in coordination with other instruments of national power to maintain or re-establish a safe and secure environment, provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief. (JP 1-02)

strategic effect

Actions ... [aimed to create effects] that directly or indirectly result in the disruption or shattering of an adversary's cohesion, will, or ability to wage war. (B-GA-400, 41)

surge

A temporary increase in operational tempo to meet contingencies and utilizing existing facilities and establishments. (DTB record 36851)

surveillance (surv)

The systematic observation of aerospace, surface or subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other means. (DTB record 1418)

sustainability

The ability of a force to maintain the necessary level of combat power for the duration required to achieve its objectives. (DTB record 5474)

synchronization

The action of maintaining common timing and coordination of the execution of two or more asynchronous procedures. (DTB record 12168)

task

An activity which contributes to the achievement of a mission. (DTB record 20312)

task force (TF)

A temporary grouping of units, under one commander, formed for the purpose of carrying out a specific operation or mission.

A semi-permanent organization of units, under one commander, formed for the purpose of carrying out a continuing specific task. (DTB record 1457)

tenets of aerospace power

The main principles which have been developed from past experience to provide specific considerations for the employment of airpower in the future. The tenets of airpower include centralized control and decentralized execution, flexibility and versatility, synergistic effects, persistence, concentration, priority, and balance. (B-GA-400, 28)

transformation

A continuous and proactive process of developing and integrating innovative concepts, doctrines and capabilities in order to improve the effectiveness and interoperability of military forces. (DTB record 28097)

vector

A heading given by a controller to a pilot on the basis of radar-derived information to provide navigational guidance. (DTB record 36568)

whole-of-government approach (WoG approach)

An integrated approach to a situation that incorporates diplomatic, military, and economic instruments of national power as required. (DTB record 35242)