



National  
Defence

Défense  
nationale



# Air Force Vectors

Agile  
Integrated  
Reach  
Power



Canada



# Air Force Vectors

This is an abridged version of *Air Force Vectors*. The complete document is an electronic publication available on the RCAF intranet site.

### Director General Air Force Development

NDHQ/Chief of the Air Force Staff  
Major-General George R. Pearkes, Bldg.  
101 Colonel By Drive  
Ottawa, Ontario K1A 0K2

NDID Number: A-GA-007-000/AF-008

ISBN Number: 978-1-100-54518-9

Catalogue Number: D2-300/1-2014

Design and editing by Canadian Forces Aerospace Warfare Centre Production Section.

1<sup>st</sup> Edition, 2014

This publication supersedes A-AG-007-000/AG-004, *Strategic Vectors* 1<sup>st</sup> Edition, 2004;  
A-AG-007-000/AF-002, *The Aerospace Capability Framework*, 1<sup>st</sup> Edition, 2003; and  
A-GA-007-000/AF-007, *Air Force Strategy*, 1<sup>st</sup> Edition, 2009.

The official and most current version of *AFV* is available electronically on the D Air Readiness and Plans intranet website available at: <http://airforce.mil.ca/caf/dairsp/page-eng.asp?cid=41>.



# 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

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*

E-Publishing of RCAF Strategic Documents

The full version of AFV has considered wide-ranging strategic guidance and policy to provide first-principles-based deductions that underscore Canadian airpower demands and attributes and to identify those core RCAF<sup>1</sup> outputs needed to deliver airpower today and in the future. The vision-vector-strategic objective construct is used to describe the RCAF of the future, guide our transformation efforts, and initiate the changes needed to move toward making our vision a reality.

The full version of AFV should be considered fundamental reading for all RCAF airpower professionals.

1. Editor’s Note: The abbreviation “RCAF” and the term “Air Force” are used interchangeably and are one and the same thing.

In order to enable our strategic agility, the RCAF is implementing an e-publishing approach of key products, thus permitting updates and adjustments in a timely manner.

The diagram at Figure 1 depicts our three key products which collectively provide strategic direction for the RCAF and will be available on the RCAF intranet website.

The role of these products is detailed in this document, which is an abridged version of the full AFV. For a more in-depth look at the analysis and deductions that underpin the RCAF mission, vision, vectors and core airpower output summarized here, the reader is referred to the full AFV available on the RCAF website.

# Table of Contents

Foreword..... iii

    The RCAF Mission..... iv

    The RCAF Vision..... iv

    E-Publishing of RCAF Strategic Documents..... iv

**Chapter 1**

Strategic Guidance Framework ..... 1

**Chapter 2**

Strategic Context..... 4

**Chapter 3**

The RCAF Mission..... 8

    The Core Capabilities Defined..... 10

    Institutional Responsibilities and Processes ..... 11

    Core Processes..... 12

**Chapter 4**

RCAF Vision and Vectors..... 13

    Vector 1: Agile..... 13

    Vector 2: Integrated ..... 14

    Vector 3: Reach ..... 15

    Vector 4: Power..... 15

    Foundational Elements ..... 16

        People ..... 16

        Leadership..... 16

        Airworthiness ..... 17

        Technology..... 17

        Sustainability..... 17

**Chapter 5**

Implementation ..... 19

Abbreviations..... 20

Glossary ..... 21

# List of Figures

Figure 1. Strategic Guidance Framework..... 2

Figure 2. Campaign Plan Framework ..... 3

Figure 3. Domestic Airpower Challenges ..... 5

Figure 4. A Different Airpower Perspective ..... 6

Figure 5. Deductions Overview ..... 7

Figure 6. Vision-Vector-Strategic Objectives Overview ..... 14

# List of Tables

Table 1. RCAF Core Airpower Capabilities..... 9

Table 2. Assigned Defence Tasks ..... 9

Table 3. RCAF Airpower Attributes..... 10



## Chapter 1

# Strategic Guidance Framework

Canadian defence strategy is defined by the three defence roles described in the *Canada First Defence Strategy*: 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). This overarching strategic direction provides the context for RCAF strategic planning and informs *Air Force Vectors*. 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*.

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 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 airpower institution. The Air Force must remain 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 revised strategic guidance framework underpins the contemporary demand for institutional agility. An overview of the main governance documents follows, and their interrelationship is shown in Figure 1.

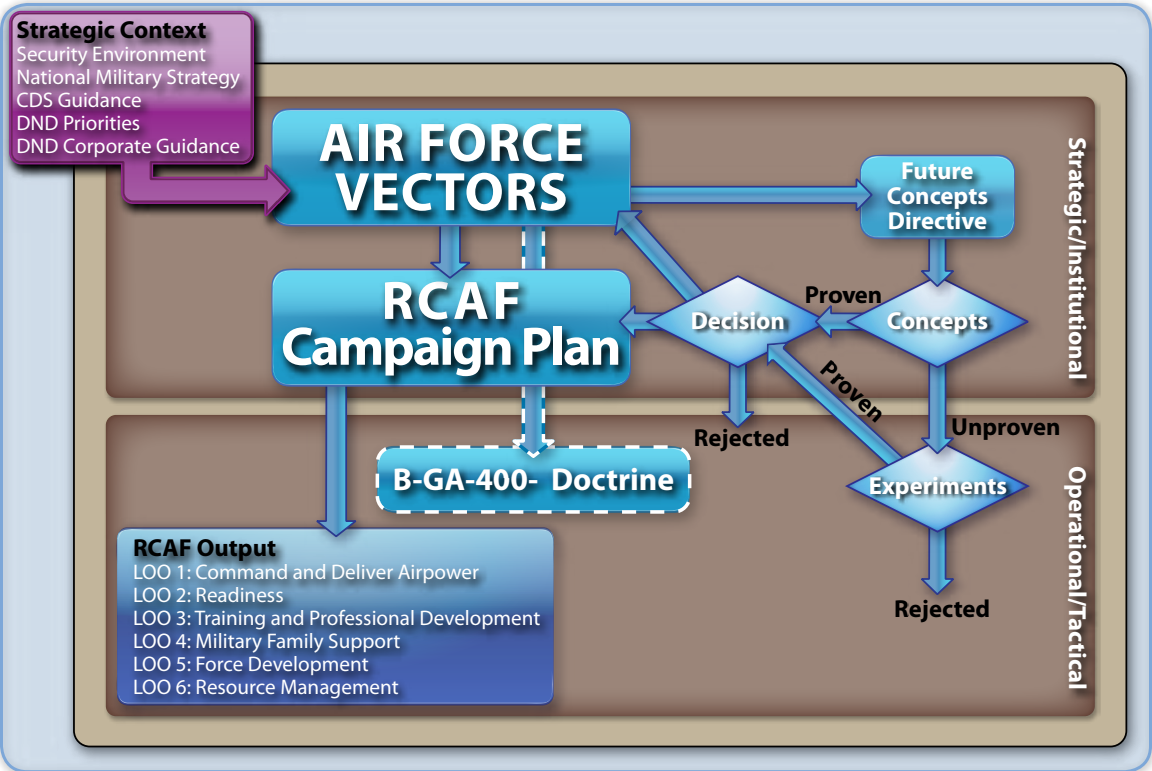


Figure 1. Strategic Guidance Framework

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. This integrated and joint focus for Canadian airpower demands is a fundamental theme throughout this revised strategic guidance framework.

**Air Force Vectors (AFV).** The purpose of this document is to articulate, from the commander’s perspective, the defence and security challenges facing the nation. It also provides 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 the Air Force strategic direction.

**Future Concepts Directive (FCD).** 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.

**Campaign Plan (CP).** The CP operationalizes the strategy articulated in AFV and is a key consideration when attempting to balance sustaining current capabilities and developing new ones. 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. It is the vehicle used to harness effort at the strategic and operational levels in the direction the Commander Royal Canadian Air Force

(Comd RCAF) requires to both sustain the present airpower delivery demands and facilitate the transformation of the Air Force into the considered future airpower capability. 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 framework is drawn directly from AFV using the mission and core capabilities

as a metric for output, the core processes to derive our lines of operation, the foundational elements (identified at Chapter 4) as centres of gravity to protect, and the aspiration to achieve the vision as the end state. Figure 2 provides an illustration of the CP framework.

Having now provided an overview of the revised RCAF strategic guidance framework, the next two chapters deal with the strategic Canadian airpower mission analysis.

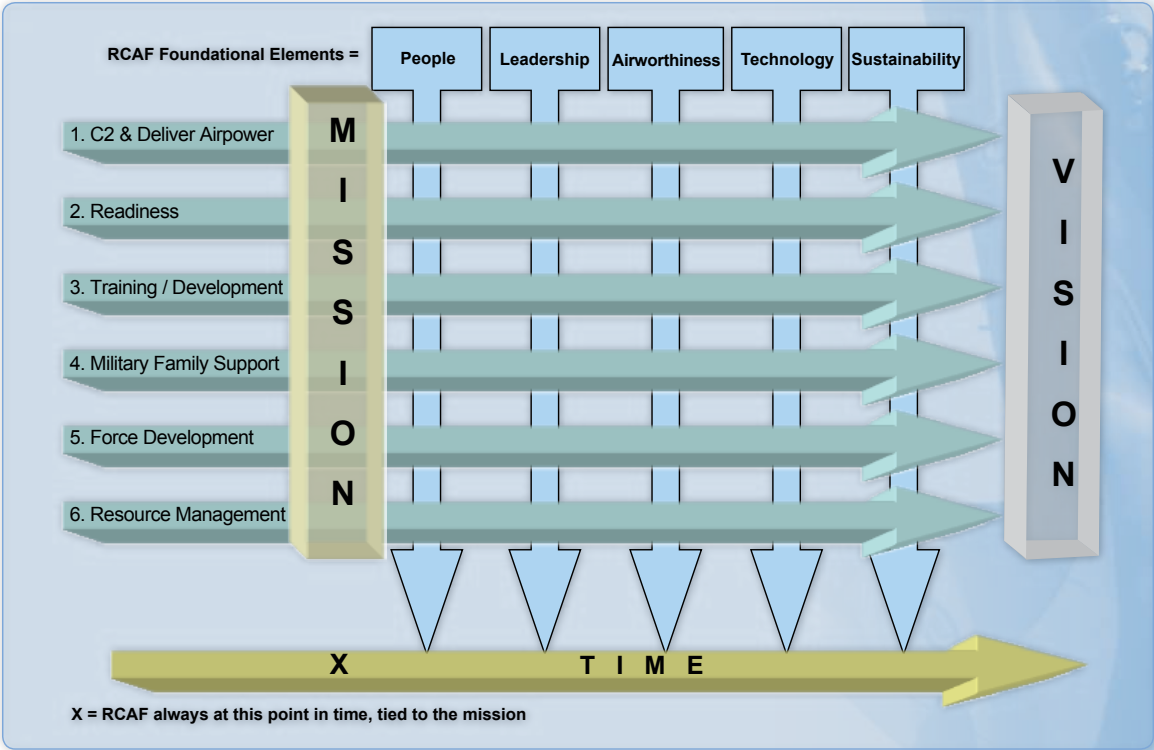


Figure 2. Campaign Plan Framework

### Chapter 2

# Strategic Context

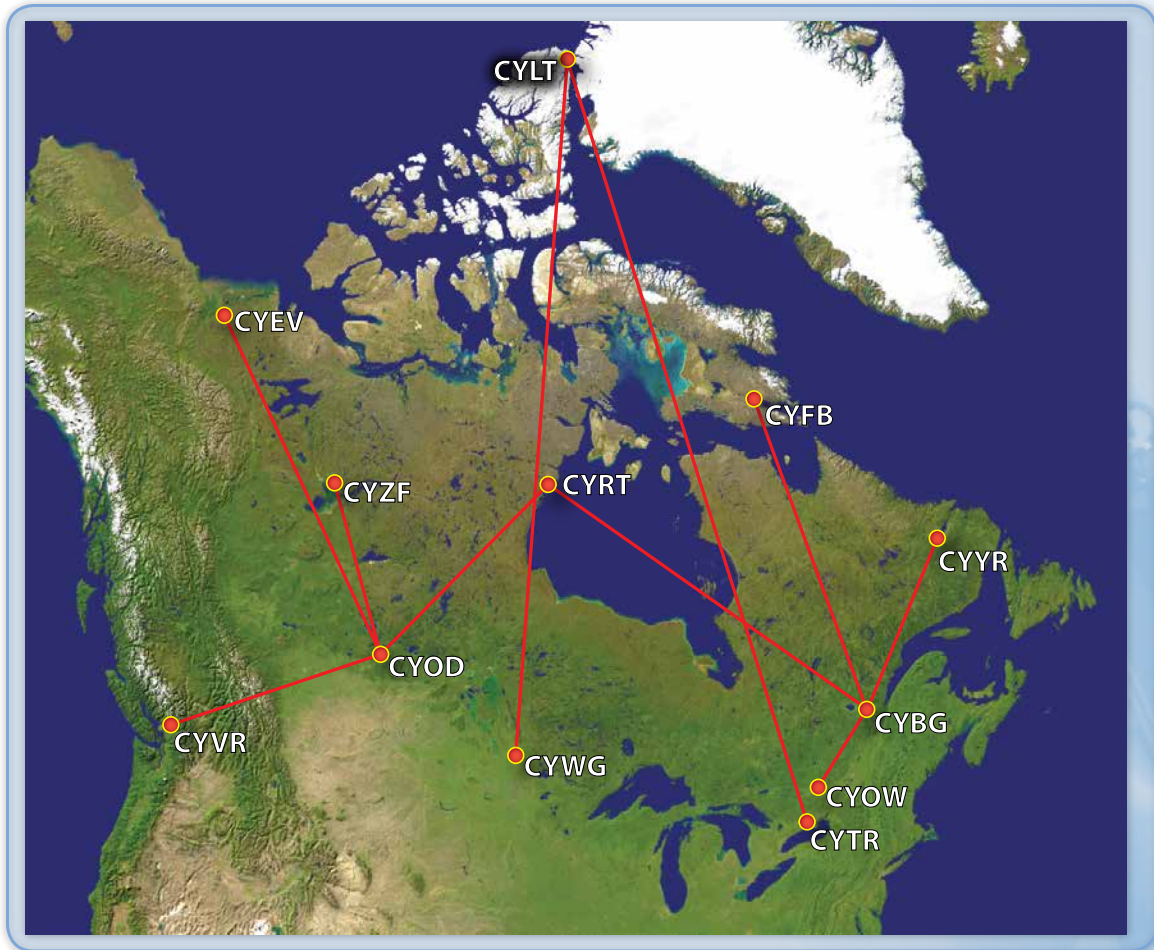
The surface of the Earth is covered by approximately 30 per cent land and 70 per cent sea, but 100 per cent air.

To fully understand the strategic context and mission analysis, it is necessary to read the complete electronic version of *AFV* Chapter 2 available on the RCAF intranet site (see page ii for intranet address). This abridged version of *AFV* captures only the highlights of this analysis.

Airpower is critical for Canada's defence and security. Geography determines it; history proves it. Changes in the political-strategic environment have not altered the fundamental and enduring nature of the nation's defence and security challenges. *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. Our nation is surrounded by three oceans—one abutting a former cold war threat—with an extensive coastline, and shares 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. How these challenges are met is shaped by emerging technology and new

concepts to harness this technology, while constrained by economic conditions and other government priorities.

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.



From	To	Distance mi (km)	From	To	Distance mi (km)
Cold Lake CYOD	Inuvik CYEV	1220 (1963)	Bagotville CYBG	Rankin Inlet CYRT	1290 (2076)
Cold Lake CYOD	Rankin Inlet CYRT	870 (1400)	Bagotville CYBG	Iqaluit CYFB	1070 (1722)
Cold Lake CYOD	Vancouver CYVR	660 (1062)	Bagotville CYBG	Goose Bay CYRR	580 (933)
Cold Lake CYOD	Yellowknife CYZF	580 (933)	Bagotville CYBG	Ottawa CYOW	305 (491)
Winnipeg CYWG	CFS Alert CYLT	2370 (3814)	Trenton CYTR	CFS Alert CYLT	2680 (4313)

Figure 3. Domestic Airpower Challenges

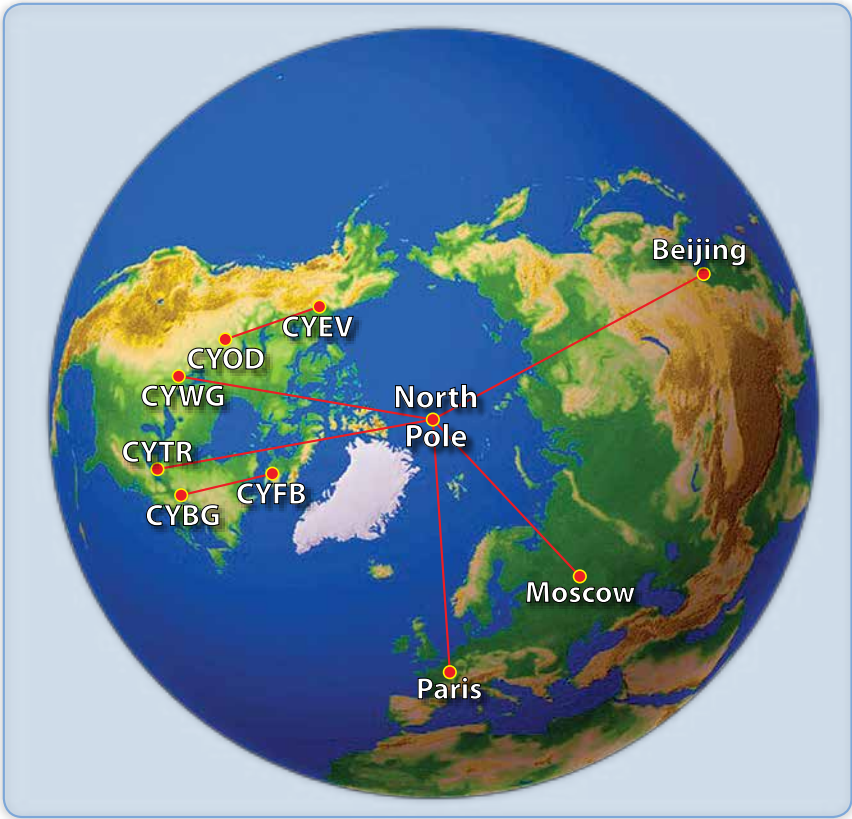
The demands of international commitments are less clear, particularly where and how many could arise. However, irrespective of the frequency, international commitments will require a rapid response, underpinning the need to maintain robust expeditionary capabilities. The possible nature of the operations and a commitment to a whole-of-government (WoG) approach also require the capability to sustain these operations



for often undetermined lengths of time. They also need enhanced interoperability and command, control, communications, computers, intelligence, surveillance and reconnaissance (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



From	To	Distance mi (km)	From	To	Distance mi (km)
Cold Lake CYOD	Inuvik CYEV	1220 (1963)	Paris	North Pole	2840 (4571)
Winnipeg CYWG	North Pole	2780 (4474)	Moscow	North Pole	2390 (3846)
Trenton CYTR	North Pole	3180 (5118)	Beijing	North Pole	3460 (5568)
Bagotville CYBG	Iqualuit CYFB	1070 (1722)			

Figure 4. A Different Airpower Perspective

integration with the Canadian Army, Royal Canadian Navy, special operations forces (SOF), as well as other government departments; and finally, through interoperability with allies and coalition partners.

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.

Beyond the platforms and equipment, if the RCAF is to succeed, it must 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 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. Figure 5 provides an overview of the key deductions and attributes.

Now that the strategic context has been considered in deriving relevant airpower deductions, we can conclude the strategic mission analysis in Chapter 3 by considering the impact, the “so what” for Canadian airpower demands.

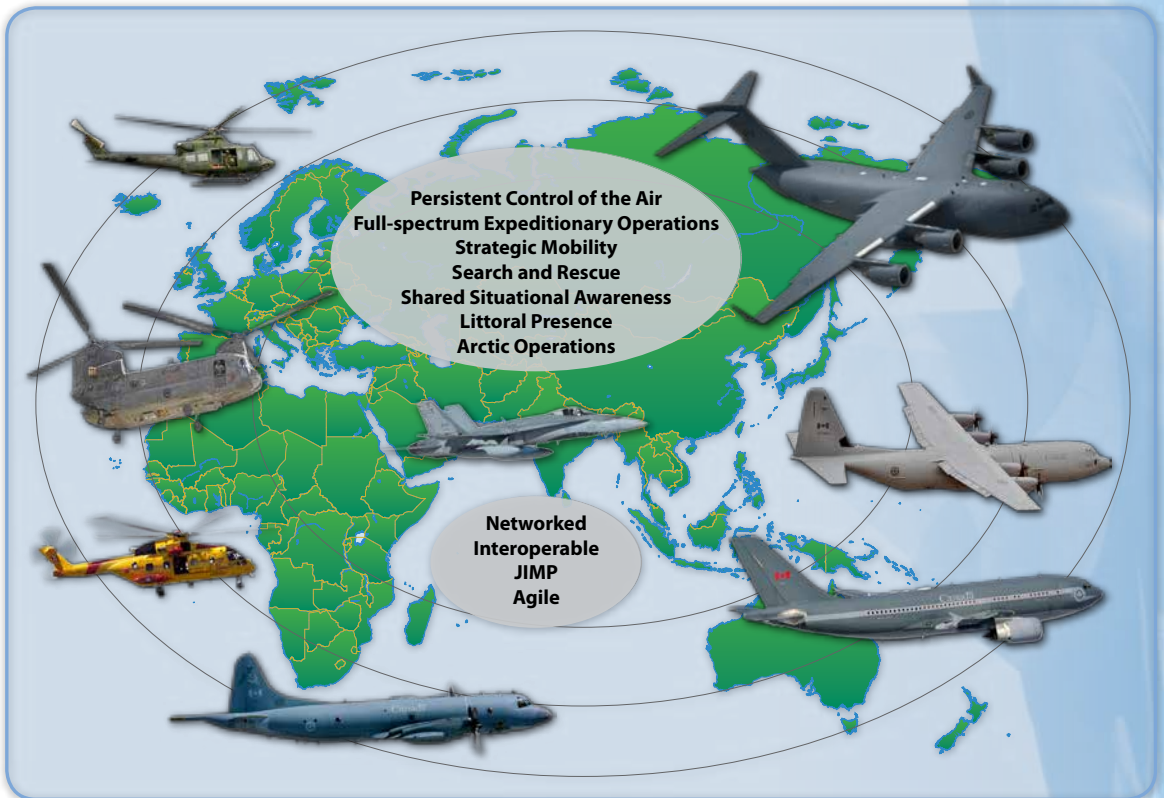


Figure 5. Deductions Overview

### Chapter 3

# 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*

A number of themes identified from the mission analysis detailed in the full version of AFV helped define our airpower mission and are summarized below with the intended context:

#### Relevant:

- trained and equipped for an increasing and ongoing focus on the Arctic region;
- interoperable at all levels with the United States Air Force (USAF) and, thus, other United States (US) forces; other key allied Air Forces (United Kingdom, Australia, and New Zealand); and North Atlantic Treaty Organization (NATO); and
- innovative airpower use in urban and complex environments with reduced collateral damage.

#### Responsive:

- recognizes the need for both institutional and individual agility in a dynamic and unpredictable defence environment: airpower will enable timely CAF response; and

- balances defence of Canada with maintaining expeditionary capabilities.

#### Effective:

- refers to the importance of precision and its relationship to real-time intelligence;
- recognizes the growing importance of non-kinetic airpower capabilities;
- stresses the need for persistence; and
- 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.

We can deduce from the strategic context and government missions the specific capabilities and roles for CAF airpower as well as those attributes unique to the development of RCAF and Canadian airpower capabilities. 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. A summary of the deductions, core capabilities, and attributes is provided in Table 1, 2, and 3.

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 <sup>1</sup>	Networked
Precise	Global
Balanced with non-kinetic and lethal options	

Table 3. RCAF Airpower Attributes

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 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

1. “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.

commerce as soon as the airspace control authority (usually the dual-hatted function of the 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.**<sup>2</sup> 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:

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

2. Attack is understood to mean an application of energy, physical or psychological, lethal and non-lethal.

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

- curtail interference from hostile land and naval forces;
- inhibit the enemy's ability to manoeuvre;
- deny the enemy an ability to concentrate their forces; and
- 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 identify hostile targets to defend against or attack. 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.<sup>3</sup>

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](http://www.rcaf-arc.forces.gc.ca/cfawc/CDD/Doctrine/Pubs/Operational/404_Series/B-GA-404-000-FP-001.pdf) (accessed November 2, 2012).

**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 build the joint situational awareness that leads to decision superiority.<sup>4</sup> 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.

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

To deliver the core airpower capabilities and attributes required by the CAF, the RCAF as an institution must ensure its personnel are trained, properly equipped, and organized.

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

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.

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:

- deliver airpower today;
- develop airpower for tomorrow; and
- carry out performance measurement and auditing.

At the risk of oversimplifying these responsibilities, some examples of the supporting activity are provided below:

- deliver airpower today:
  - flight safety programme;
  - technical and operational airworthiness programme;
  - environmental stewardship; and
  - doctrine development;
- develop airpower for tomorrow:
  - future concept development;
  - joint experimentation;
  - defence research and analysis;
  - lessons learned programme; and
  - strategic planning; and
- carry out performance measurement and auditing:
  - exercise programme;

- business planning; and
- force validation.

### 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:

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

Chapter 3 concludes the RCAF strategic mission analysis and sets the foundation for the Comd RCAF to detail his related vision and the Air Force vectors for transformation in Chapter 4.

## Chapter 4

# RCAF Vision and Vectors

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

What does the RCAF need to do to meet the demands for airpower today and in the future? First and foremost, the Air Force must be prepared to respond quickly whenever and wherever needed while maintaining surveillance and control of Canada's approaches. Limits on resources mean it must work efficiently and effectively across its own communities—as well as with the rest of the CAF, the government, and allies—to maintain Canadian airpower. 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 *Campaign Plan*. 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 21<sup>st</sup> century. Figure 6 provides a graphical depiction of this vision-vector-strategic objective model. 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.

## Vector 1: Agile

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

*The likelihood of collective actions abroad will require robust and flexible expeditionary airpower.*





Figure 6. Vision-Vector-Strategic Objectives Overview

**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:**

- maintain excellence as a learning organization;
- review force readiness;
- enhance force generation;

- employ and enhance a strategic guidance framework; and
- develop knowledge-management standards and practices.

**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.

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

**Description.** “Integrated CF operations” refers, first, to the “full manifestation of interoperability”<sup>1</sup> but goes further.

1. 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).

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 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.<sup>2</sup> 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 WoG, joint, interagency, multinational, and public (JIMP) approach.

### Strategic Objectives - Integrated:

- be interoperable;
- advance the JIMP concept;
- enhance collaboration through new technology and concepts;
- be networked;
- engage with other airpower practitioners;
- connect with Canadians; and
- be a steward of airpower.

### Vector 3: Reach

**Intent.** While the paramount focus for the RCAF remains Defence of Canada, there is a requirement, even in that task, to achieve a robust expeditionary capability. Therefore, the RCAF will continue to transition into an expeditionary force capable of applying its core airpower capabilities at home and around the globe.

*Canada will continue to export security to promote prosperity and stability.*

2. Ibid.

**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, 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;
- better integrate RCAF airpower to enhance<sup>3</sup> CAF's expeditionary capacity; and
- enhance reach to assert control.

### Vector 4: Power

**Intent.** The RCAF will contribute to the 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.

*The RCAF will defend Canada through our ability to detect and defeat threats at the earliest opportunity.*

**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,

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

physical, and moral components. 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;
- be combat effective;
- be capability focused;
- conduct capability development, operational planning, role fulfillment, and results analysis with a focus on effects; and
- enhance RCAF force preservation.

### Foundational Elements

The RCAF's ability to change will depend on the foundation provided by the Air Force's *people, leadership, airworthiness, technology, and sustainability*. People, leaders, safety, technology, and sustainability are the Air Force's centres of gravity that must be protected to enable the evolution of the Air Force. Should any one of the foundational elements weaken, progress towards the commander's vision will be threatened, and ultimately, the ability to develop and deliver airpower will also be threatened. The Air Force of the future is the sum of the interaction between the vectors and foundational elements (its people, leaders, and technology as well as the ability to sustain them).

### People

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

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.

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

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).<sup>4</sup> 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.<sup>5</sup> 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

4. A-PA-005-000/AP-004, *Leadership in the Canadian Forces: Conceptual Foundations* (Canadian Defence Academy [CDA] – Canadian Forces Leadership Institute [CFLI]: 2005), xiv, <http://www.cda-acd.forces.gc.ca/cfli-ilfc/doc/dndcon-eng.pdf> (accessed November 29, 2011, site discontinued).

5. A-PA-005-000/AP-006, *Leadership in the Canadian Forces: Leading the Institution* (CDA-CFLI: 2007), <http://www.cda-acd.forces.gc.ca/cfli-ilfc/doc/Leading%20the%20Institution%20-%20English.pdf> (accessed November 29, 2011, site discontinued).



end rather than allow a learning-on-the-job methodology. And 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 science and technology (S&T) community, industry, and the RCAF.

In the hands of highly skilled people and strong leadership, leading-edge technology 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. 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. 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. The RCAF priorities in these areas will be outlined in a periodic *Air Force 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, 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 *Canada First Defence Strategy (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 later 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 RCAF and 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 toward its vision). It also provides the Comd 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.

# Abbreviations

AAR	air-to-air refuelling	JIMP	joint, interagency, multinational, and public
ACC	air component commander	km	kilometre
AFV	<i>Air Force Vectors</i>	mi	mile
ASUW	antisurface warfare	OCA	offensive counter-air operation
ASW	antisubmarine warfare	ops	operations
C2	command and control	PD	professional development
CAS	close air support	RCAF	Royal Canadian Air Force
CAF	Canadian Armed Forces	S&T	science and technology
CFDS	<i>Canada First Defence Strategy</i>	SAR	search and rescue
CFS	Canadian Forces Station	SIGINT	signals intelligence
Comd	Commander	SOF	special operations forces
RCAF	Royal Canadian Air Force	VIP	very important person
CP	<i>Campaign Plan</i>	WoG	whole-of-government approach
DCA	defensive counter-air		
FCD	<i>Future Concepts Directive</i>		
FD	force development		
IMINT	imagery intelligence		

# 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, 1<sup>st</sup> 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](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. DTB – *Defence Terminology Bank*, found online at <http://terminology.mil.ca/>.
- c. JP 1-02 – US Joint Pub 1-02, *DOD Dictionary of Military Terms*, [http://www.dtic.mil/doctrine/dod\\_dictionary/](http://www.dtic.mil/doctrine/dod_dictionary/).
- d. ODO - *Oxford Dictionaries Online*, <http://oxforddictionaries.com/>.

## **agile**

Able to move quickly and easily. (ODO)

## **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)

## **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)

### **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)

### **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.

### **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 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 projection**

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

### **force readiness**

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

### **function**

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

### **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)

**intelligence, surveillance and reconnaissance (ISR)**

An activity that synchronizes and integrates the planning and operation of all collection capabilities with processing and dissemination of the resulting information to the right person, at the right time, in the right format, in support of operations. (DTB record 30996)

**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)

**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)

**mission (msn)**

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

**non-kinetic**

Said of non-destructive means to achieve desired effects. (DTB record 43729)

**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)

### **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)

### **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)

### **task**

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

### **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)