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EXERCISE NEW HORIZONS

THE RATIONALE AND REQUIREMENT FOR AN INTEGRAL CANADIAN FORCES STRATEGIC LIFT CAPABILITY

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Abstract

This paper discusses the current Canadian Forces strategic lift deficiency and demonstrates that the shortfall would best be resolved by the procurement of new sealift and airlift resources.

As background, Canadian Foreign, Domestic and Defence policy is examined to establish both the rationale and the requirement in the Canadian Forces for strategic lift capabilities. The expeditionary implications of Canadian interests both abroad and at home are addressed in these policies as they form the basis for the organizational structure that the Canadian Forces are expected to deploy, sustain and recover. Considering that force projection globally within specific timelines is the mandate, determining the strategic lift requirements for Canada's Main Contingency Force is undertaken using both airlift and sealift. Such capability would essentially be sufficient to meet other needs as well. Comparing Canada's capabilities against the requirement for strategic lift highlights the lift deficiencies.

A review of options then suggests that an increase in integral strategic lift assets, including as many as eight cargo ships and ten aircraft with outsize carriage capacity, should be the goal.

"Canada must … aim to punch its weight and become more assertive globally."

Paul Martin[1]

Canadians, while justifiably proud of their armed forces' long record in contributing to global stability, are becoming concerned that all is not well.[2] Two main concerns underscore their attention. The first concern is the state of the Canadian Forces (CF) after the federal government imposed successive years of budgetary reductions designed to balance domestic and international priorities.[3] The second concern is the stark reality that the security environment since the end of the Cold War has become more uncertain.[4]

Still, there are many successes. Recent operations in Afghanistan underline the quality of individual army, navy and air force personnel and their ability to perform effectively as members of a coalition force. At the same time, such success serves to

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[1] "Martin stakes out a solid global role." The Toronto Star. 3 May 2003. <www.thestar.com> accessed 3 May 03.

[2] David Jay Bercuson. To Secure a Nation: The Case for a New Defence White Paper. (Calgary: University of Calgary. Centre for Military and Strategic Studies. 2000), p. 16.

[3] Canada, The Standing Committee on National Defence and Veterans Affairs. Facing Our Responsibilities; The State of Readiness of the Canadian Forces. (Ottawa: House of Commons, 2002), chap. 2b.
"a growing consensus began to emerge to the effect that the Canadian Forces could no longer sustain themselves and their missions without a significant infusion of funds. Between 1993 and 1998, the defence budget fell by 23% and the Department's real purchasing power fell by more than 30%. In 1998, the Auditor General (AG) argued that an additional $5-6 billion was required in the capital account over the next five to ten years to replace worn-out equipment. In 2001 the AG revised the annual shortfall upward to $1.3 billion." [from $750 million].

[4] Canada, Department of Foreign Affairs and International Trade. The Protection Of Our Security Within A Stable Global Framework. <http://www.dfait-maeci.gc.ca/world/menu-en.asp> accessed 2 March 03.
Canada, Director of Land Strategic Concepts. The Future Security Environment. (Kingston: DND, August 1999), p. vii.

highlight even more chronic problems in areas such as troop availability, equipment and the ability to deploy and sustain forces.[5] The CF even has had difficulty in deploying a small Army contingent to Afghanistan in 2001 and had to rely on the United States to move its equipment. As a result, a debate has ensued with consensus on the need to revitalize the military.[6]

Canadians are ready to consider improvements to their military and its capability to undertake operations.[7] To do that, attention to strategic mobility, amongst other capabilities, is necessary.[8] Strategic mobility, which concerns the movements to, from and between operational theatres, includes tasks associated with the sustainment of armed forces.[9] Strategic lift assets needed to facilitate such movement tasks may include aircraft, ships, trucks and trains. However, the CF focus is on airlift and sealift because

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[5] Pierre Jones. Towards an Expeditionary Army. (Calgary: Council for Canadian Security in the 21st Century, August 02). <http://www.ccs21.org> accessed 25 April 03.
Sustainment involves the maintenance of the force by continual re-supply shipment of personnel and cargo for the duration of the operation.

[6] Canada, The Standing Committee on National Defence and Veterans Affairs. Facing Our Responsibilities; The State of Readiness of the Canadian Forces. (Ottawa: House of Commons, 2002), Introduction.

Michel Fortmann, Alex Macleod. Future Canadian Defence Policy. (Montreal: Defence Forum 8 December 2000). <http://www.forces.gc.ca/admpol/eng/doc/534_e.htm> accessed 7 May 03.

[7] Leger Marketing. December 2001 Survey of Canadian Attitudes Towards the Military. <http://www.defendourcanada.ca/attitudes.php> accessed 6 May 03.

[8] Canada, Department of National Defence. Strategic Capability Planning for the Canadian Forces - Canadian Joint Task List. (Ottawa: DND), S.6.2.6.
Addressed is the need to match transportation and sustainment requirements to ensure support to the force within Canada and to and from the theatre of operations.

[9] General C.C. Krulak. Expeditionary Operations. (Washington: Department of the U.S. Navy, US Marine Corps, 1998), chap. 2.
An expeditionary capability involves the deployment of military forces some significant distance from their home bases with their requisite support for the purpose of resolving a particular crisis or conflict.

those are the only resources capable of providing force mobility anywhere on the globe.[10] Reflecting the recent public attention on CF capabilities and the current CF strategic lift problem, this paper will demonstrate that procurement of new sealift and airlift resources is required.

As background, this paper first affirms the rationale and requirement for strategic lift as outlined in current foreign, domestic and defence policy. Following a determination of current CF lift requirements, a review of lift capabilities establishes that the CF has very limited strategic air resources, no heavy-lift aircraft capability and, realistically, no sealift capability. Options to remedy the shortfall include commercial hire or lease, arrangements with allies, and purchase of integral resources. The discussion of these alternatives considers that blending of the options may provide an acceptable solution but ultimately leads to the conclusion that acquiring additional integral capability would be the best option for the CF.

The rationale and requirement for strategic lift assets can be established from Department of Foreign Affairs and International Trade (DFAIT) and Department of National Defence (DND) policy documents. The *1995 Foreign Policy Review* and the *1994 Defence Review*, issued separately but conducted concurrently, provide the current policy and planning considerations by enunciating the requirement to deploy CF elements. While strategic mobility in the Canadian context has traditionally referred to deploying forces over considerable distances to other continents, it is also recognized that

[10] G.E. Sharpe. CF Concept of Operations for Expeditionary Operations- Issues and Questions resulting from the DCDS Strategic Retreat. (Ottawa: DND, February 02), p.5.

the vast geography of Canada makes the distinction between overseas and internal deployments only of academic interest. Therefore, the following discussion will refer to the implicit policy requirement for an expeditionary capability and the inherent need for strategic lift that can be employed in the interest of Canada's foreign and domestic policies.

DFAIT has expressed Canada's interest in projecting influence beyond her borders. This is not done in an explicit statement, but it may be interpreted from the *1995 Foreign Policy Review*. It highlights "three key objectives: the promotion of prosperity and employment; the protection of our security, within a stable global framework; and the projection of Canadian values and culture."[11] These objectives are not mutually exclusive as there is a linkage between security, global stability and Canada's prosperity.

> "Assuring Canada's security remains a fundamental responsibility of government. Canadians recognize the vital link between their own security and prosperity and the security of others."[12]

Canada subscribes to a concept of shared human security to offset crises. Increasingly, environmental degradation, religion, disparity between the rich and the poor, problems of health, politics, human rights and the rule of law are becoming friction points that disrupt peace and security. Military forces, or hard diplomacy, may be required before, during or after conflict erupts or in the resolution of crises that arise from natural disaster. Foreign policy includes the projection of values and a part of that value system relates to

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[11] Canada, Department of Foreign Affairs and International Trade. Canadian Foreign Policy Summary. <http://www.dfait-maeci.gc.ca/foreign_policy/cnd-world/summary-en.asp> accessed 19 April 2003.

[12] Canada, Department of Foreign Affairs and International Trade. The Protection Of Our Security Within a Stable Global Framework. <http://www.dfait-maeci.gc.ca/world/menu-en.asp> accessed 2 March 2003.

Canadians' wish to be involved in solving these crises, regardless of where they occur.[13] It is a combination of all these ideas that lend credence to the concept of an expeditionary capability that necessitates the requirement for strategic lift. As would be expected, these ideas postulated in foreign policy are reflected in defence policy.

Defence policy reiterates the government's foreign policy objectives directly in the DND and CF mission statement, which is "to defend Canada and Canadian interests and values, while contributing to international peace and security."[14] The same consistency of approach in Defence Policy would be expected when applied to domestic issues as crises may also occur in Canada.

Domestically, the Office of the Solicitor General coordinates activities to counter violations of the Canadian Criminal Code. Canada's legal system, with its rigorous safeguards, ensures that the fundamental rights and freedoms of Canadians are upheld.[15] A key component in this security mechanism, is the assistance that the CF can be requested to provide when local, provincial or federal police forces cannot maintain the desired level of order. CF organizations are not only expected to defend Canada and support the Solicitor General and the Provinces in the maintenance of law and order but also to provide a response to natural disasters that exceed local emergency response

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[13] Canada, Department of Foreign Affairs and International Trade. Projecting Canadian Values and Culture. <http://www.dfait-maeci.gc.ca/foreign_policy/cnd-world/chap5-en.asp> accessed 26 Feb 03.

[14] Canada, Department of National Defence. Canadian Forces Operations. (Ottawa: DND, 18 Dec 2000), p. 1-1.

[15] Canada, Department of the Solicitor General. National Security. (Ottawa: OSG, 10 Apr 2002). <http://www.sgc.gc.ca/national_security/index_e.asp> accessed 25 May 2003.

capabilities. As the Honourable David Collenette said when he introduced the *1994 White Paper* as the Minister of National Defence, "The defence of Canada and Canadian interests and values is first and foremost a domestic concern."[16] More recently, the current Minister of National Defence also enunciated this view when he said,

> "Domestically, there are core functions that the Canadian Forces must always carry out. The army must respond to domestic crises like the ice storm, and it must contribute to homeland defence."[17]

The domestic operations referred to in Figure 1 exemplify the importance of mobility. Troops must be capable of arriving in the correct place at the correct time. Strategic mobility was essential in each case to deploy and sustain the troops involved.

Thus far, the basic policy discussion supports a mobile expeditionary capability for both international and domestic operations. At this point, CF strategic lift requirements can be considered. This will be done in terms of the length of the lines of communications, the force structure in terms of its size and composition, the potential number of simultaneous operations, the deployment timelines, the degree of self-sustainment required and the characteristics of transportation assets.[18]

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[16] Canada. Department of National Defence. White Paper on Defence. (Ottawa: DND, 1994).

[17] The Honourable John McCallum, Minister of National Defence. Speaking Notes for the Conference of Defence Associations Annual General Meeting SP-27.02.03. (Ottawa: 27 February 2003).

[18] The Standing Committee on National Defence and Veterans Affairs. Facing Our Responsibilities; The State of Readiness of the Canadian Forces. (Ottawa: House of Commons, 2002), chap. 2.a.

Figure 1.[19] The scope of Domestic Operations stretches from the provision of equipment and personnel to eq

international security."[21] This means that strategic lift resources must be capable of supporting CF missions with single or multiple supply lines anywhere on earth, a view confirmed when the White Paper says, "the Canadian Forces will participate in multi-national operations anywhere in the world."[22] Additionally, the makeup of the organizations involved is naturally an important consideration in determining the quantity and type of lift assets required.

As a planning principle, Canada is committed to the idea that the CF would be prepared to deploy a force structured and organized as the Main Contingency Force (MCF). The *1994 White Paper* outlines the organizational planning requirement indicating that such a force, "could conceivably involve in the order of 10,000 military personnel." The MCF would include a joint task force headquarters; a naval task group; three separate battle groups or a mechanized brigade group; a wing of fighter aircraft; and one squadron of tactical transport aircraft. An infantry battalion group of less than 1,000 personnel to act as either a stand-by force for the UN, or to serve with NATO's Immediate Reaction Force is also designated from within the overall force generation capability of the MCF. This force forms a part of the MCF Vanguard, the Vanguard being an advance element totaling up to 4,000 personnel.[23] In addition to having sufficient resources to lift an organization, those resources must be capable of delivering the organization to its destination in time to favourably influence the situation.

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[21] Canada. Department of National Defence. 1994 White Paper on Defence. (Ottawa: DND, 1994), chap. 6.

[22] Canada. Department of National Defence. 1994 White Paper on Defence. (Ottawa: DND, 1994), p. 38.

[23] Canada. Department of National Defence. 1994 White Paper on Defence. (Ottawa: DND, 1994), chap. 6.

Readiness expectations indicate that the MCF is expected to be completely deployable within three months, while the MCF Vanguard is to be deployable within three weeks.[24] Once the force arrives, it must be capable of operating effectively until the lines of communications are sufficiently established to provide replenishment, reinforcements and/or replacements. The definition of sustainment factors will assist in determining lift requirements.

Regardless of where the forces deploy or what force configuration is involved, these forces must include integral service support and be indefinitely sustainable in a low-threat environment. For an operation that lasts longer than six months, the existing regular force service support establishment is not expected to be capable of sustaining a force the size of the entire MCF. To ensure sustainability, mobilization plans first enhance the force, and then expand the force, initially utilizing members of the primary reserve.[25] Plans also exist to augment service support through the use of a Canadian Contractor Augmentation programme known as CANCAP.[26] Not all of the same strategic lift resources committed for deployment are required indefinitely for sustainment. During deployment, redeployment or rotation an increase or surge in lift capability is required over the routine sustainment activity level. Also affecting the amount of lift capacity are the initial supply requirements and the subsequent usage rates. Frequency of deployments can also assist in defining the CF strategic lift requirement.

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[24] Canada. Department of National Defence. 1994 White Paper on Defence. (Ottawa: DND, 1994), chap. 6.

[25] Canada. Department of National Defence. 1994 White Paper on Defence. (Ottawa: DND, 1994), chap. 7.

[26] Canada, Department of National Defence. National Military Support Capability Concept. (Ottawa: DND, Sep 2000), p. 10.

Further distinguishing the resource requirement is the actual mode of transport, be it sealift or airlift.

Sealift can carry troops and/or large tonnages of materiel over large distances at relatively low cost. Limitations include speed, vulnerability and port restrictions.[27] Sea movement may be considered slow when only small quantities are being shipped, although when large volumes are involved, a single 28,000 tonne cargo ship can deliver the equivalent of 2,000 CC-130 Hercules aircraft loads. It would take much longer or a considerably higher number of aircraft to deliver the load as quickly or efficiently, so where volume is an important consideration, ships are more efficient than airlift.[28] Ships are not particularly responsive to immediate tasking due to long lead times. It generally requires at least thirty days notification to contract and position a ship in a Canadian port. Ships are vulnerable targets as was demonstrated when terrorists attacked *USS Cole* on 12 October 2000.[29] Additionally, access to ports may be restricted for a variety of reasons. For example, berthing may be restricted by space availability or limitations in facility capacity in terms of dock size, crane capacity or depth alongside. Harbours and their approaches may have insufficient depth. Diplomatic clearance issues could also preclude access. Somewhat compensating for these limitations is an "over-the-shore

[27] P Comeau, Maj M MacDonald. Strategic Lift Concept Study and Lift Analysis: Sealift Capability and Concepts for Project M2673 ALSC. (Ottawa: DND, 17 Dec 1998), p. 15.

[28] Lt Col Donald E Ryan Jr., USAF. The Airship's Potential for Intertheater and Intratheater Airlift. Alabama: Air UP, June 1993.), p. 13.

[29] US Navy Newspecial. "*USS Cole* (DDG 67) returns to the Fleet." <http://www.chinfo.navy.mil/navpalib/news/news_stories/cole.html> accessed 23 April 2003.

loading/unloading" capability using such technologies as lighterage barges that can be transported on ships equipped with appropriate handling equipment.

Airlift is characterized by responsiveness. Provided that the airframes are available, shipments can be delivered quickly almost anywhere in the world. Furthermore, and in spite of the obvious capacity limits when compared with sealift volumes, there are aircraft such as the C-17 Globemaster that will haul virtually all load sizes that the CF would normally commit to a deployment.[30] A major limitation of strategic airlift is commercial availability. Not only are there usually insufficient commercial airframes, but also the specific aircraft must match the load in terms of bulk and weight. As well, those airframes must be available within a reasonable range of the Air Port of Embarkation (APOE) to support not only deployment but also aircraft maintenance. Securing diplomatic clearance for routes and airfields can be problematic as was the case for Canada when attempting to develop its strategic lines of communication to Afghanistan in 2001. Other limitations include vulnerability, as is the case with sealift, and cost in terms of both procurement and operating and maintenance.[31]

Both types of lift are complementary. For operations requiring immediate reaction, airlift is a better option particularly when the size of the force and its equipment is small

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[30] P Comeau, Maj M MacDonald. Strategic Lift Concept Study and Lift Analysis: Sealift Capability and Concepts for Project M2673 ALSC. (Ottawa: DND, 1998), p. 21.
The Globemaster C-17 aircraft is designed to carry any size military cargo and with four times the payload of a CC-130 Hercules. When the greater range and speed capability is considered, the C-17 has 14 times the move capability.

[31] Lt Col Donald E Ryan Jr., USAF. The Airship's Potential for

enough to be transportable on only a few flights. This has been the case in a number of domestic emergencies or when immediate intervention with small numbers of troops can deter hostility. Deployment of early reconnaissance elements of vanguards requires the speed which only airlift can provide. Just-in-time delivery of equipment replacements is also often best accomplished by air. However, airlift can be very expensive when compared to sealift for moving large volumes of material or equipment as is indicated in Table 1.

	ALSC [32]	CC-130	CC-150	C17
Cost (TMPD)	**$0.04**	**$3.08**	**$0.64**	**$0.41**

Table 1 - **COST COMPARISON OF SHIPMENTS IN TON MILES PER DAY (TMPD)**[33]

Combining airlift for personnel and sealift for materiel and equipment is the most efficient option. This option takes into account the relatively low volume in weight and size that characterizes airlift and the high cost of moving personnel by sea, which is related to wages and life support costs.[34] Assuming that diplomatic clearances are in place to offer secure forward co-located air and sea ports, personnel can rendezvous with their equipment and supplies at a safe location, having departed by air well after the sea

[32] Afloat Logistics and Sealift Capability (ALSC) ships are 28,000 tonne transport and logistic support vessels that will accommodate ~ 2500 lane meters of cargo.

[33] P Comeau, Maj M MacDonald. Strategic Lift Concept Study and Lift Analysis: Sealift Capability and Concepts for Project M2673 ALSC. (Ottawa: DND, 1998), p. 22.

[34] United States Navy. Military Sealift Command Backgrounder. (Virginia Beach: MSC, 2003), p. 3.

movement commenced.[35] This provides additional benefit such as facilitating additional troop pre-deployment training. The discussion thus far has reviewed policies and planning considerations and has established the requirement for strategic lift, thereby providing the basis for a more detailed analysis of the CF strategic lift requirements.

In the preceding policy discussion, the *1994 White Paper* review provided specific details regarding force capability. Deploying the MCF represents the largest single commitment for which the CF must plan and provides the basis for strategic lift planning. As previously mentioned, the MCF would include approximately 10,000 military personnel. Planning documents envision that, to be sustainable for 30 days, the MCF would require 36,000 shipping lane-metres of cargo.[36] The Director of Operational Research has applied this data against a scenario where the theatre is 8,000 nautical miles distant to determine efficient and effective strategic lift options.[37]

The Director of Operational Research study considered various permutations between airlift and sealift resources, optimizing for economy and transport efficiency.[38]

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[35] United States Army. Field Manual 100-5, Fundamentals of Army Operations. (Washington: TRADOC.), chap. 2.

[36] Canada. Department of National Defence. 1994 White Paper on Defence. (Ottawa: DND, 1994), chap. 6.

Canada, VCDS. Defence Planning Guidance 2000. (Ottawa: DND, 2000), Change Objective Four (C04) Globally Deployable. para. 205. 1.d, para. 208, figure 2-2.

[37] P Comeau, Maj M MacDonald. Strategic Lift Concept Study and Lift Analysis: Sealift Capability and Concepts for Project M2673 ALSC. (Ottawa: DND, 1998), p. 23.

[38] P Comeau, Maj M MacDonald. Strategic Lift Concept Study and Lift Analysis: Sealift Capability and Concepts for Project M2673 ALSC. (Ottawa: DND, 1998), pp. 21 - 31. Optimizing for economy uses the greatest proportion of sealift, and uses the least transportation platforms. Optimizing for transport, uses the shortest time frame and the maximum flow that can be achieved with a specific set of transportation resources.

Achieving the maximum economy did not meet the required deployment timelines. The results of this study found that it took the entire force 215 days to arrive in theatre. However, optimizing for transport efficiency achieved the shortest deployment timelines and succeeded in delivering the entire force within 30 days from when the force was available to load.[39] The Vanguard was able to be in theatre within 20 days. To accomplish this required eight 2,500 lane-metre ships carrying 80 percent of the total cargo. The remaining cargo would be delivered on ten C-17 sized aircraft while the passengers could be delivered in a total of 50 CC-150 Polaris loads.

With such a large requirement, a more economical approach that includes some risk was introduced. The rationale for this choice is based upon force planning options that appear in *Strategy 2020* and *Defence Planning Guidance 2000* and involves using a force the size of the Vanguard as a planning organization. Considering that there has been no international operation requiring a CF deployment of even this size since the Korean War and that future deployments have been assessed to require smaller and more frequent force commitments, the MCF is not very likely to be deployed.[40] Not even domestic or training deployments have exceeded a force the size of the Vanguard over the past ten years.[41] Moreover, the Vanguard must be able to deploy quickly leaving

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[39] P Comeau, Maj M MacDonald. Strategic Lift Concept Study and Lift Analysis: Sealift Capability and Concepts for Project M2673 ALSC. (Ottawa: DND, 1998), pp. 21 - 31.

[40] Canada, Chief of Defence Staff. Shaping the Future of the Canadian Forces; A Strategy for 2020 - Part I: Looking to the Future, Emerging Strategic Environment. (Ottawa: DND, June 1999).

Canada, VCDS. Defence Planning Guidance 2000. (Ottawa: DND, 2000), Change Objective Four (C04) Globally Deployable. para. 205,1.d.

[41] Maj MML Rafter, J4 Mov Ops, NDHQ, Ottawa. Telephone interview. 6 May 2003.

little time to acquire ships or aircraft from trade. Therefore, it is not a great risk to consider basing CF lift capability on the Vanguard, relying upon commercial ships and aircraft should there be a requirement to deploy and sustain a larger force. The entire move could be completed on time using five ships for the cargo load of approximately 12,500 lane metres and 20 CC-150 flights for the move of the 4,000 personnel. Alternatively, the use of ten C-17s, each flying 25 loads, could further reduce the shiploads required to four. This could be used as a good starting point for developing a procurement strategy.

The difference between the entire MCF requirement and the Vanguard requirement could be used for prioritization of effort in terms of procurement commitments. If that were done, the range of strategic lift requirement could be summarized as four to eight 2,500 lane metre ships, up to ten C-17 or equivalent cargo aircraft and five CC-150 or equivalent passenger aircraft. The scenarios discussed have identified the CF detailed requirements for strategic lift. Now, an examination of existing CF assets will determine if a shortfall in CF capability exists.

There is little difficulty in establishing that the CF has an existing shortfall in strategic lift. DND planning documents assert that, "the CF is currently far from…capable in military strategic mobility."[42] Existing strategic lift deficiencies are well known beyond the DND. On 28 April 2003, in the House of Commons, the Right Honourable Joe Clark queried the Minister of National Defence on how the government

[42] Canada, Department of National Defence. Strategic Capability Planning for the Canadian Forces. (Ottawa: DND), chap. 5.

was going to compensate for heavy lift deficiencies during the planned August 2003 deployment to Afghanistan. Since the shortfall is recognized, it becomes a matter of detailing the deficiency, in terms of ships and aircraft.

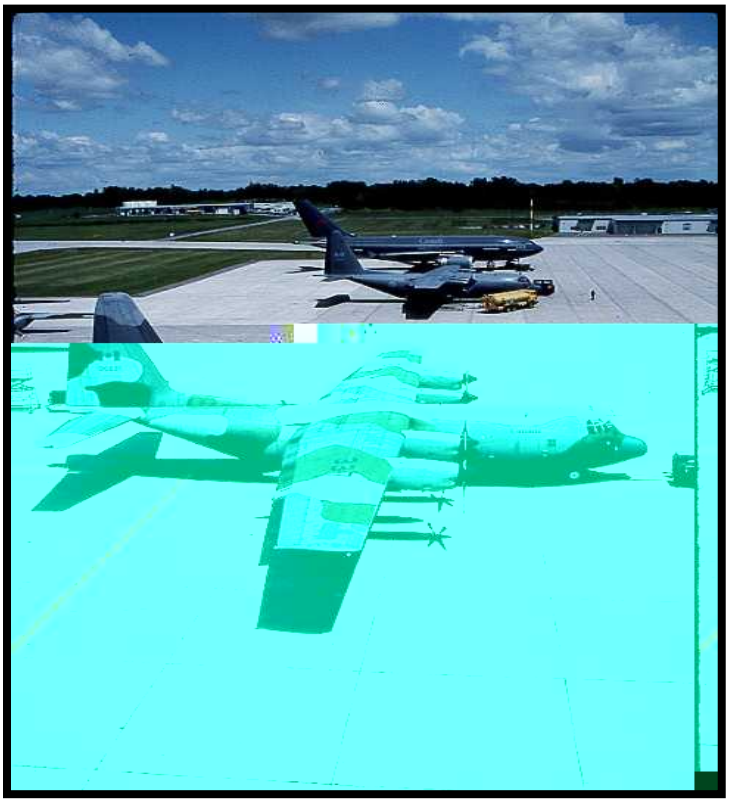

Figure 2.[43] Canadian Airlift Resources.
CC-130 Hercules in the foreground and CC-150 Polaris to the rear.

Although the *1994 White Paper* suggested that the support ship *HMCS Provider* was capable of providing limited sealift of troops, equipment and supplies for multilateral operations, the reality is different. That vessel is primarily designed to conduct fleet Replenishment At Sea (RAS) and is ineffective as a transport or sealift platform. Canada

[43] Canada, Chief of Air Staff. Photo. CC-150 Polaris. By Mike Reyno. (Ottawa: CAS, 11 August 2002). <http://www.airforce.forces.gc.ca/equip/polaris_summary_e.htm> accessed 26 February 03.

does not currently possess any integral sealift capability, although it does hold limited integral airlift resources.

When speed is essential and cargo volume is not great, deploying by air is required. At present, Canada's inventory of strategic airlift is only five CC-150 aircraft, satisfy most personnel deployment requirements but have very little cargo capacity. Although the CF has used its fleet of 32 CC-130 Hercules extensively, they have neither the range nor the cargo capacity to accomplish strategic airlift in an economic or efficient manner.[44] So, when Canada's inventory is compared against the requirement, it is apparent that there is no integral capability to deliver outsized cargo by air or sea. To meet the defence policy direction, requires four to eight 28,000 tonne cargo ships and up to ten C-17 equivalents. To address these deficiencies, Canada has been dependent upon commercial carriers and charters. However, there are other options that can be considered.

Of the options available to solve the CF shortfall in strategic lift, each of these can be assessed against the criteria of availability, security, capacity, operational flexibility and affordability.[45] The options themselves include commercial hire or lease,

[44] Canada. The Standing Committee on National Defence and Veterans Affairs. Facing Our Responsibilities; The State of Readiness of the Canadian Forces. (Ottawa: House of Commons, 2002), chap. 4, para. h.

[45] Canada, Chief of Maritime Staff. Leadmark.The Navy's Strategy for 2020. (Ottawa: CMS, Jun 2001), p. 160.

arrangements with Allies, or purchase of integral resources.[46] Each option will be considered for both sealift and airlift.

Canada has been using commercial charters or simply shipping cargo by commercial carriers for many years. This option may be further extended wherein lease or subsidy arrangements obligate ship owners to carry military cargo. This is referred to as Ships Taken Up From Trade (STUFT). Any of the commercial options seems attractive because there is no capital cost and operating and maintenance expenses are low. Canada only spent $10M between July 1993 and July 1997 on commercial sealift and did not engage in any STUFT arrangements.[47] The problems with commercial contracts, other than STUFT, are availability and control or security of the shipment.

Availability problems relate to lead-time, commercial fleet depreciation and competition. Normally, it takes 30 days administration and notification time to position a ship in a Canadian port. This time is too long to satisfy the readiness and deployment timelines of the Vanguard. At the same time, over the past twelve years, ship charters have been available based on the assets that the Ukraine has made available from the remnants of the old Soviet fleet. However, these aging ships are not being replaced as they are retired. Commercially, military operations are not routine business and commercial ship owners do not purchase ships simply to meet contingencies. Availability is further compromised during military operations by competition with Allies

[46] LCdr A. Round. Strategic Sealift: A Case for Ownership. (Toronto: CFC, 1994), p. 13.

[47] P Comeau, Maj M MacDonald. Strategic Lift Concept Study and Lift Analysis: Sealift Capability and Concepts for Project M2673 ALSC. (Ottawa: DND, 17 Dec 1998), p. 9.

for the same limited resources.[48] This occurred during the Gulf War when the British needed commercial resources to move their field hospital and found that no commercial cartage was available.[49]

The international nature of the shipping business affects control and security. As Mark Romanow has reported, "The proliferation of flags of convenience diminishes political control."[50] A carrier might have allegiances contrary to that of Canada or her Allies and consigned cargo could be at risk. Even commercial disputes can be prejudicial, as was exemplified in the case of the chartered cargo ship *GTS Katie*, which was hired to return equipment to Canada from Kosovo. Canada's shipment of 580 vehicles and 390 sea containers of equipment, worth C$223 million, was essentially held hostage because of a third party dispute which did not even involve any complaint against the Canadian government. Ultimately, Canada deployed two warships, boarded *GTS Katie* and compelled the Master to deliver the load.[51] (Figure 3.)

Canada cannot afford unnecessary risk to its military equipment inventory. This reinforces the idea that availability and security issues make commercial options

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[48] Mark Romanow. Canada's Strategic Sealift Conundrum, (Edmonton: 2003), Notes from the Western European Union Defence Assembly, 2001.

[49] Robert O'Connor. "Sealift Shortfall During Gulf Crisis Sent UK Scrambling for Transport." Armed Forces Journal International. (Oct 1991), p. 38.

[50] Mark Romanow. Canada's Strategic Sealift Conundrum, (Edmonton: 2003.) Notes from the Western European Union Defence Assembly, 2001.

[51] Canada, Deputy Chief of Defence Staff. DND Operations. (Ottawa: DND). <http://www.forces.gc.ca/site/operations/megaphone_e.asp> accessed 30 April 2003.

unreliable and risky as a mechanism for the CF to satisfy its strategic deployment requirements.

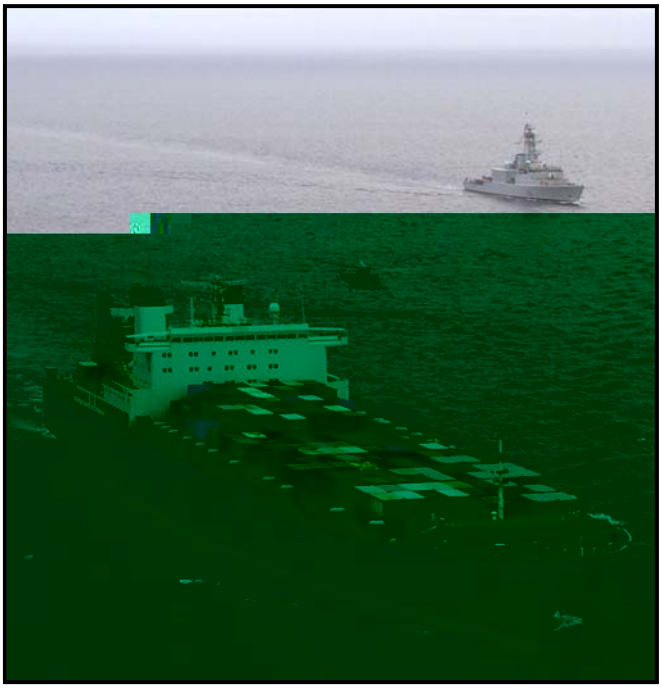

Figure 3.[52] Operation Megaphone.
GTS Katie under CF escort to secure return of CF equipment.

Alternatively, Canada could seek arrangements with Allies to either share or make available surplus strategic lift assets. However, once again, the option is unreliable because of lack of availability. Canada's allies do not always agree to participate on the same missions. Furthermore, Canada may believe it is in her interest to participate in missions beyond the scope of any particular Alliance. Even within the North Atlantic Treaty Organization (NATO), not all members agree. The recent US deployment to Iraq raises this very issue. Several NATO countries did not agree with the military action and

[52] Canada, Director General Public Affairs. Photo. Observing isd00-445. By WO Larry Graham, J5PA. (Ottawa: DPGA Combat Camera). <http://www.forces.gc.ca/site/operations/megaphone_e.asp> accessed 30 April 2003.

may have declined to share their sealift assets had they been participants in an arrangement with the US. Aside from shared assets, surplus capacity contracts are based upon space being available. These types of arrangements do not assure equal priority for customers at the expense of their own shipments because no country has surplus sealift, except by exception.[53] So, under any arrangement with allies, availability cannot be assured.

Thus, Canada's only viable option is to ensure its own strategic sealift. Within this option, Canada's alternatives are to purpose build ships, to convert existing ships, or to arrange permanent lease. Recognizing the requirement prompted the CF to initiate the Afloat Logistics and Sealift Capability (ALSC) project. The ships are currently scheduled for commissioning by 2009, if the project is approved.[54] These ships would provide RAS for the remainder of the fleet and be available for sealift as needed. The project calls for a total of four vessels, which would accommodate deployment of the Vanguard within the prescribed 21 days of the load being ready, if all ships and ten C-17 aircraft were available. An alternative to these multi-purpose ships would be the conversion of existing ships. Generally, the purchase costs for a purpose built ship with 2,500 lane metres is approximately $400M, while the conversion of commercial ships of

[53] United States Navy. Military Sealift Command Fact Sheet April 2003. <http://www.msc.navy.mil/factsheet/apf.asp> accessed 23 April 2003.

[54] Canada, VCDS. Defence Planning Guidance 2000. (Ottawa: DND, 2000), Capital Project Priorities. para. 206,8.
Canada, Chief of Maritime Staff. Leadmark. The Navy's Strategy for 2020. (Ottawa: CMS, June 2001), chap. 7.

approximately the same size and utility is one half the cost.[55] This option would provide the opportunity to purchase more ships, which would still be in keeping with policy that necessitates eight ships and strategic air assets to deliver the MCF. During peace, Canada could market any surplus capacity to its Allies, and would have assured itself of deployability of more than just the Vanguard of the MCF.

A third alternative is long term or permanent lease. The US has leased most of its cargo capacity on long-term arrangements, although use of a Voluntary Inter-modal Sealift Agreement also provides assured access to commercial shipping at pre-agreed rates during emergencies.[56] In this way, there is no capital required to procure the ships, the operating expenses are clearly established in advance and the US Navy controls the ships and their loads.[57] The only problem with this option is cost. Logically, the lessor must make a profit and ultimately the CF will pay a greater cost by leasing than for outright purchase.

Purchase alternatives could all meet the criteria for deployments if enough ships are procured. The multipurpose aspect of the ALSC is a useful approach that provides both transport and fleet support while the conversion option appears to be the least expensive. Long-term lease options eliminate the need for any capital expenditure. As

[55] Mark Romanow. Canada's Strategic Sealift Conundrum. (Edmonton: 2003), Notes from the Western European Union Defence Assembly, 2001, p.1.

[56] United States Navy. Military Sealift Command Backgrounder. (Virginia Beach: MSC, 2003), p. 3.

[57] United States Navy. Military Sealift Command Fact Sheet April 2003. <http://www.msc.navy.mil/factsheet/apf.asp> accessed 23 April 2003.

we turn to the analysis of airlift options, the same general options exist to offset airlift shortfalls.

Options for strategic airlift include commercial hire, arrangements with allies or the purchase of an integral resource. As with sealift, availability looms as the greatest problem with all of the options other than ownership.

Canada is dependent on commercial carriers and charters to augment the lift available from the CC-130s and the CC-150s. The issues associated with commercial options are carrier risk aversion, fleet depreciation and security. For outsized loads that have destinations in high-risk environments, such as those in areas of conflict, there are few companies prepared to accept the risk. Since the early 1990s, Canada has been in the practice of hiring from a single source that will accept that risk. Air Foyle, now a British and Ukrainian company, operates the Antonov-124 aircraft. Only eight of these Cold War airframes remain available and they are currently not being replaced when attrition from either accident or age depletes the fleet.[58] Eventually, the entire resource will retire. Anticipation of this reality has already resulted in increased competition for these airframes, reducing their availability and increasing their cost. Increased competition also occurs during periods of commercial opportunity as was exemplified during the Mozambique floods in the spring of 2000. Humanitarian efforts by the international community were intensive and the airlift available commercially was insufficient. As demand exceeded supply, Antonov charter prices rose dramatically. Canada had planned

[58] Defence Industries - Airforce. Antonov Airlines - AN 124-100 Airlift and Charter Specialists. <http://www.airforce-technology.com/contractors/airlift/air_foyle/> accessed 7 May 2003.

to deliver helicopters for internal humanitarian resupply and search and rescue but the entire operation became unaffordable and was cancelled.[59]

Political motivation by foreign contractors could result in jeopardized loads. Contract non-compliance in such cases could easily be the least of Canadian concerns. By simply delaying delivery, a mission could be rendered unsuccessful. The Russian Government's influence over Air Foyle regarding the transport of military equipment and their refusal to grant overflights during Operation Alliance almost caused such a situation. In that case, the CF could not deploy its assigned elements to Afghanistan. Without an integral capability or over-flight and landing rights, Canada's deficiencies presented a significant problem. Eventually, a suitable line of communications was formed and the United States was able to assist Canada by transporting Canadian cargo. However, all of the negotiations and attempts to arrange commercial carriage delayed the deployment and in turn prejudiced mission success. Furthermore, Canada had no ability to perform a recovery operation should the need have arisen. In essence, the troops in Afghanistan were stranded and wholly reliant on other nations.

Making arrangements with Allies for the collective use of airframes is a popular concept from a financial perspective; however, there are risks, particularly if the allies do not reach consensus on mission participation. Still, there may be an alternative for Canada to take the lead, strengthen alliances and economically benefit. Recently the Minister of National Defence said,

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[59] Maj F. Costello. Restructuring Canada's Air Force: Adopting a Niche Capability in Air Transport. (Toronto: CFC, 2001), p. 15.

> "… the Canadian Forces will not be unilaterally purchasing large transport planes, at a cost of some $3-5 billion. … We will consider other, much more cost-effective options, such as a strategic lift capability shared with NATO allies, including the United States."[60]

This statement eliminates the option of strategic airlift procurement, unless it is in participation with our NATO allies who all have similar strategic lift deficiencies.[61] Either an approach of pooling national airlift assets under the direction of a NATO Mobility Command structure or role specialization could be used.[62] Pooled resources are less likely to meet national objectives and the coordination aspect requires consensus of all NATO members.[63] The potential exists for conflicting political ideas, inaction, and a general lack of control over deployments. Alternatively, a limited form of role specialization in airlift would allow Canada to purchase strategic transport aircraft for use "to complement and supplement NATO as a whole" and not otherwise constrain Canada.[64] In June 2000, Lieutenant General Kinsman, then Chief of the Air Staff, stated that the CF has "a well-established and recognized requirement for an outsized C-17-like

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[60] Speaking Notes for The Honourable John McCallum Minister of National Defence at the Conference of Defence Associations Annual General Meeting. (Ottawa: 27 February 2003).

[61] Giovanni de Briganni, "Kosovo Air War Expose Major Deficiencies in NATO Capabilities," Defence-aerospace.com. <http://www.defensee-aerospace.com/data/features/data/fe57/index.htm> accessed 26 February 2003.
The EU has ambitions of fielding a corps of approximately 50,000 troops, deployable within sixty days. However it has had difficulty even moving troops and equipment to neighbouring Kosovo.

[62] North Atlantic Treaty Organization. NATO Handbook. (Brussels: NATO Press, 2001), p. 50.

Canada, Department of Foreign Affairs and International Trade. Canada's NATO Policy Priorities - Prague Summit, November 2002. <http://www.dfait-maeci.gc.ca/foreign_policy/nato/nato_policies-en.asp> accessed 26 March 2003.
NATO, through the Defence Capabilities Initiative (DCI), is currently studying ways to rectify its transport shortfall.

[63] North Atlantic Treaty Organization. NATO Handbook. (Brussels: NATO Press, 2001), p.154.

[64] David W. Read, "The Revolution in Military Affairs: NATOs Need for a Niche Capability Strategy," Canadian Military Journal, Vol. 1, No. 3, (Autumn 2000), p 22.

strategic airlifter."[65] Such an airframe would meet the NATO requirement and enhance Canada's readiness dramatically. Ten C-17s could, when combined with sealift, ensure the deployability of the MCF and its Vanguard. Such an ability to deliver outsized cargo would even improve ground force protection because equipment such as tanks, artillery, and command and control vehicles could be deployed by C-17 to arrive with the lead elements at the start of a mission.

Figure 4.[66] C-17 landing on an austere airstrip.
The C-17 is the leading outsized strategic range cargo aircraft for military use today.

Furthermore, the C-17 is as tactically proficient as a CC-130 when issues of delivery in combat environments are concerned, although it does require an additional 400 feet of runway to land and take-off. When compared with other airframes that can carry similar

[65] William B. Scott, "Bolder Budgets Restore Canada's Air Force." Aviation Week & Space Technology, (26 June 2000), p. 82.

[66] United States Air Force. C-17 Globemaster. Photo. <http://www.af.mil/photos/transports_c17.shtml> accessed 25 March 03.

loads, the C-17 is both more efficient and more effective. It can carry everything that a C-5 will carry without the maintenance problems and it has twice the payload of a C-141. The capital outlay for the procurement of a fleet of ten C-17 aircraft that would meet all of Canada's deployment needs associated with the MCF would be just under US$1.7 billion.[67]

The difficulties associated with load security and control, in addition to assured availability, point to one undeniable fact for both strategic airlift and sealift. The preferable option is for an integral CF resource.

The intent of this paper was to discuss the rationale for the CF to procure new strategic lift capabilities. In arguing that Canada requires a capability to deploy forces internationally and domestically, reference has been made to Canada's foreign, domestic, and defence policies. These policies support the notion that the security of Canadians is directly linked to international stability, in turn giving rise to the requirement for the CF to maintain an ability to project forces globally to meet the CF mission. Nationally, the CF must also be prepared to react to emergencies when the capabilities of the Solicitor General or the provinces are insufficient to either maintain law and order or to respond to natural disaster. Given this national will to deploy forces anywhere in the world, including throughout Canada, it was necessary to establish what forces would be required to meet governmental direction. The force structure itself is a key component in

[67] Richard Aboulafia, "Strategic Airlift Market Uneven," Aviation Week & Space Technology, Vol. 150, No. 2, 11 Jan 1999, p. 22. C-17 unit price reportedly may get as low as $172 million U.S.

determining the number and configuration of ships and airplanes that would be required to support deployment and sustainment.

The 1994 White Paper, defines the force structures that the government is prepared to commit to operations. The largest identified planning force would involve a MCF of approximately 10,000 personnel. These forces are expected to be deployable in two groups. Within 21 days, the initial Vanguard of some 4,000 would deploy, then to be followed by the remainder within 90 days. A planning model has indicated that the combination of airlift and sealift to deploy these troops and their materiel requirements would necessitate as many as ten C-17 Globemasters, eight 28,000 tonne ships, such as the Afloat Logistics and Sealift Capability vessel, and five CC-150 Polaris aircraft. Comparing this requirement against the current strategic lift inventory, which only includes the Polaris capability, highlights the CF strategic lift deficiency.

The capability deficiency is even more marked when actual deployment history suggests that even the small deployments to which the CF has been committed could not be accomplished without reliance on commercial charters or arrangements with allies. That deficiencies exist does not automatically imply that the requirement must be offset by CF ownership of strategic lift resources. However, as was argued, all of the options other than purchasing a capability include flaws in terms of availability or security. Deteriorating commercial fleets, competition generated inflation of costs, disadvantages in prioritization that delay deployments as well as the risks associated with foreign

nationals controlling vital military supplies all point to the requirement for an owned or at least controlled fleet.

Canada cannot rely solely on commercial contracts or sharing with allies because of uncertainty in availability and security concerns represented by a basic lack of control. Exemplifying these problems was the difficult position that Canada faced when contractor disputes impeded a CF shipment aboard *GTS Katie*. That situation as with other the other examples cited is evidence suggesting that CF ownership of sufficient strategic airlift and sealift is the most desirable option. However, the cost of such an increase in capability is considerable and inhibits the procurement process that would be necessary to correct the entire deficiency, so alternatives are worth considering.

The first alternative discussed was based upon procurement of only enough strategic lift to provide for organizations the size of the Vanguard or smaller. It has been argued that this is a more realistic and efficient option as it coincides with the actual CF capability and the reality of deployments over the past several years. This alternative suggests that four ASLC type sized ships and ten C-17 sized aircraft could meet the deployment requirement. Such an option would imply that commercial contracting or sharing with Allies will still be required if the less likely MCF sized force were required. An additional option would be procurement of a fleet large enough to meet all deployment requirements and then using the routinely available surplus to transport allies as a specialist nation. Either of these options involves the procurement of additional strategic lift.

Regardless of the number of ships and the high cost of ownership, the fact remains that Canada's military interest involves global engagement and domestic responsibilities that require rapid deployment of forces over great distances. The CF can only support this interest effectively by having the mobility capability that the procurement of new sealift and airlift assets would provide.

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