Defence Procurement Reform in Other Nations

Defence Procurement Reform in Other Nations

Lieutenant-Colonel Ross Fetterly
Director Air Comptrollership and Business Management 2
National Defence Headquarters

Defence Management Studies Program
School of Policy Studies, Queen's University
2009

Library and Archives Canada Cataloguing in Publication

Fetterly, Ross, 1959-
Defence procurement reform in other nations / Ross Fetterly.

(The Claxton papers, 1491-137X ; 10)
Includes bibliographical references.
ISBN 978-1-55339-268-2

1. United States. Dept. of Defense—Procurement. 2. Great Britain. Ministry of Defence—Procurement. 3. Australia Dept. of Defence—Procurement. 4. Armed Forces—Procurement. I. Queen's University (Kingston, Ont.). Defence Management Studies Program II. Title. III. Series: Claxton papers ; 10

UC267.F48 2009 355.6'212 C2009-900636-7

The Claxton Papers

The Queen's University Defence Management Studies program, established with the support of the Canadian Department of National Defence (DND), is intended to engage the interest and support of scholars, members of the Canadian Forces, public servants, and participants in the defence industry in the examination and teaching of the management of national defence policy and the Canadian Forces. The program has been carefully designed to focus on the development of theories, concepts, and skills required to manage and make decisions within the Canadian defence establishment.

The Chair of Defence Management Studies is located within the School of Policy Studies and is built on Queen's University's strengths in the fields of public policy and administration, strategic studies, management, and law. The program offers, among other aspects, an integrated package of teaching, research, and conferences, all of which are designed to build expertise in the field and to contribute to wider debates within the defence community. An important part of this initiative is to build strong links to DND, the Canadian Forces, industry, other universities, and non-governmental organizations in Canada and abroad.

This series of studies, reports, and opinions on defence management in Canada is named for Brooke Claxton, Minister of National Defence from 1946 to 1954. Brooke Claxton was the first post–Second World War defence minister and was largely responsible for founding the structure, procedures, and strategies that built Canada's modern armed forces. As defence minister, Claxton unified the separate service ministries into the Department of National Defence; revamped the *National Defence Act*; established the office of Chairman of the Chiefs of

Staff Committee, the first step toward a single chief of defence staff; organized the Defence Research Board; and led defence policy through the great defence rebuilding program of the 1950s, the Korean War, the formation of NATO, and the deployment of forces overseas in peacetime. Claxton was unique in Canadian defence politics: he was active, inventive, competent, and wise.

The author wishes to thank Angela Wingfield for her thorough and professional job as copyeditor, as well as Mark Howes and Valerie Jarus for their continued, accomplished efforts to change the work of "mere scholars" into an attractive, readable publication. We all thank Heather Salsbury for her unflagging good spirits and willing support to the Chair of Defence Management Studies. The Chair acknowledges the support given to Defence Management Studies at Queen's University by the Department of National Defence and Breakout Educational Network, Toronto, Canada.

Douglas L. Bland
Chair, Defence Management Studies
School of Policy Studies, Queen's University
Kingston, Canada, March 2009

Contents

Introduction

> During the past 50 years, defense acquisition reform panels, studies, reviews, and commissions occurred with such frequency that they could virtually provide lifetime employment.[1]
>
> Stephen V. Reeves

Defence procurement has been a persistent subject of concern for governments across Western nations for several decades. The large dollar value of acquisition contracts, the positive employment return from major contracts, the advanced technology inherent in weapons systems to the national economy, the spinoff of political pressure on politicians in ridings with a high concentration of defence employment, and the power of defence industry advocates combine to pressure national governments to generate employment through defence procurement spending. Indeed, the sophisticated, leading-edge technology necessary for the development and manufacture of advanced weapons systems produces the high-value employment that national governments want to foster, in large part for the "multiplier effects" it provides within the domestic economy. The significant demand for defence-procurement funding stems from the rapidly evolving nature of modern warfare and the so-called revolution in military affairs. Most other government programs are less dynamic and less prone to rapid technical change. Consequently, in comparison to these other government programs, defence capital expenditure tends to overshadow capital expenditure in all other government departments.

A combination of significant and persistent cost growth in defence acquisition programs and "a systematic bias toward underestimating

the costs"[2] of procuring weapons systems makes national military capital procurement programs a lightning rod for the media, opposition parties, and interest groups opposed to defence spending. For these reasons defence procurement processes are constantly under review by governments seeking to increase efficiency, effectiveness, and timeliness in the acquisition process. This paper examines defence procurement studies, reports or policy papers produced by allied nations, to determine if there are any lessons learned in these countries that might be profitably applied by Canadian defence procurement policies and processes. The period of review begins in the mid-1980s as the Cold War was ending and continues into early 2009.

The United States defence budget surpasses by several magnitudes that of any other nation. Its defence industrial sector outpaces in scope and technology all other industrialized countries. The effectiveness of the immense annual investment in weapons systems in America is under continual review, in ongoing analysis of procurement, by the Congressional Budget Office, the Government Accountability Office, RAND Corporation, a variety of prominent American think-tanks, and the national media. The depth of informed analysis and the wealth of information and data generated by these organizations provide benchmarks that other nations use to evaluate their defence acquisition processes.

Procurement reform in the United Kingdom, a leading middle power with a significant defence establishment and close historical links to Canada, is examined next. Its reform is an appropriate alternative comparison for defence procurement reform in Canada.

Australia is the final country considered in this international overview of defence procurement reform. Although its defence forces and budget are smaller than Canada's, Australia has been prominent in deploying military personnel as part of multinational operations in failed and failing states in the post–Cold War era. Moreover, it is not as constrained by alliance commitments as Canada may be and has strived successfully to forge a more independent course of action in security issues. Thus, Australia provides a third, and different, reference point to the Canadian experience with our "strategic cousins."

CHAPTER 1

Defence Procurement Reform in the United States

> Experience has made it clear that a major key to success in defense or war lies in the effective organization and management of Government procurement.[3]
>
> Stuart J. Evans, Howard J. Margulis and Harry B. Yoshpe

Modern defence procurement reform in the United States began in June 1986 with the report by the President's Blue Ribbon Commission on Defense Management, commonly known as the Packard Commission. Since that report, an almost constant stream of similar reports on military procurement reform in the United States has been produced by Congress and other non-governmental organizations. There has been a significant shift in focus, from process to acquisition outcomes,[4] in these reports over the review period.

Packard Commission Report (1986)

The President's Blue Ribbon Commission on Defense Management consisted of four major studies and reports, each with a different orientation, as well as a final report. Of particular importance was the report *National Security Planning and Budgeting,* which responded to one of the major tasks assigned to the commission: to provide recommendations on how to "improve the effectiveness and stability of resource allocation for defense."[5] The report recommended improved linkages between national security objectives, the defence budget and national military strategy. Other commission documents included *The Legal Structure of Defense Organization,*[6] which provided an essential

historical overview of defence organization in the United States, and the framework under which it operated; as well as *Conduct and Accountability*,[7] which examined the relationship between government and industry. The significant report *A Formula for Action: A Report to the President on Defense Acquisition*[8] considered problems in the American defence acquisition system as it existed, and made recommendations for executive and legislative changes.

The final report stated that "all too many of our weapons systems cost too much, take too long to develop, and by the time they are fielded, incorporate obsolete technology."[9] This report provided an overarching focus for subsequent defence acquisition reform in the United States, with the practical objective of making its procurement system faster, better and cheaper. To support this objective, the report advocated greater use of commercial products and processes. The impact of the Packard Commission on defence acquisition in the United States, and internationally, was considerable. Indeed, the theme of "faster, better and cheaper' has echoed throughout defence procurement reform initiatives in the United States to the present day.

The scope of the Packard Commission was impressive. The series of reports produced and the broad range of subjects examined created a template for providing a broad-based analysis on a wide-ranging subject that needed reform. Indeed, in situations of that nature – particularly with interrelated processes such as defence procurement – commissioning individual reports on subjects aligned with procurement can assist subsequent reform by providing a better understanding of supporting linkages. It is surprising, given the impact that the Packard Commission has had on defence procurement in the United States, that this process has not been employed more frequently.

Defense Reorganization Act (1986)

The 1986 Goldwater-Nichols legislation in the United States was a catalyst that ushered in an intense series of reports and institutional reforms within the Department of Defense that have continued to the present date. The defence reorganization resulting from the Goldwater-Nichols legislation was the most noteworthy since the drafting of the 1947 *National Security Act* because it centralized military advice by shifting that advice from the service chiefs to the chairman of the Joint Chiefs of Staff.

Section 800 Report (1993)

The unceremonious end to the Cold War brought forth demands for reductions in defence spending, and in the early 1990s pressure was growing in Congress to produce a "peace dividend." The desire to keep the maximum amount of combat capability possible within a smaller defence establishment resulted in a course of action focused on saving money by increasing the efficiencies in defence procurement.

In the 1991 fiscal year, Section 800 of the *Department of Defense Authorization Act* instructed the department to establish the Acquisition Law Advisory Panel. This panel was directed to review acquisition laws affecting the department, with the goal of making recommendations related to repealing or amending those laws and regulations that required change. The goal was to begin a process that would ensure greater coherence in the legal procurement framework and a streamlining of acquisition practices. While appearing to be of secondary importance in the defence acquisition process, the legal framework had an overarching influence on the process and on the behaviour of the participants. Eventually, the recommendations to reform the legal framework became the foundation that enabled and supported subsequent procurement reforms and the basis for actual legal reforms undertaken the following year.

National Performance Review (1993)

The genesis of the 1993 *National Performance Review* lay in the difficult problem of attempts to overcome the policy contradictions caused by declining defence funding and the increasing instability resulting from the removal of constraints on nations in place during the bipolar Cold War. In this new and challenging environment, fundamental change to previous practices was necessary.[10] Yet, rather than fundamental change, the 1993 *National Performance Review*[11] advocated a number of tentative steps in reforming defence acquisition practices in the department, including, among others, adopting an increasing number of business practices, making a greater use of technology; and streamlining procedures. Advocates recommended strongly that a globally effective defence industrial base be a key to future reform.

The legacy of this review was a series of defence acquisition pilot programs. These programs enjoyed institutional support and encouraged both innovation and risk-taking within a very traditional and conservative

organization. This support, in turn, enabled institutional learning and subsequent organizational adaptation prior to decisions that would fundamentally change existing acquisition processes.

Federal Acquisition Streamlining Act (1994)

The *Federal Acquisition Streamlining Act*[12] incorporated recommendations from the Acquisition Law Advisory Panel and the *National Performance Review* and consolidated a myriad of laws into a procurement code. The *Federal Acquisition Streamlining Act* also consolidated the structural, legal and procedural changes that had occurred since the Packard Commission had been released. Yet, the strategic, business and procurement environments were also changing at a rapid pace, leaving the defence establishment to struggle continually to keep pace. This reality broadened the scope of needed reform and ushered in a series of further studies, all with the objective of aligning acquisition processes better with the needs of operational military units.

The *Federal Acquisition Streamlining Act* provided a necessary consolidation of preceding recommendations. However, given the rapid pace of change at the time and the simultaneous, dramatic downsizing of the defence sector, what was most needed during this period was a road map to assist the Department of Defense in navigating through this change. The *Defense Reform Initiative Report* was an attempt in that direction.

Defense Reform Initiative (1997)

The *Defense Reform Initiative Report* tabled by the United States Secretary of Defense on November 1997 echoed a theme common at the period: it was time to "reengineer" government processes "that are at least a generation out of step with modern corporate America."[13] Indeed, an organization that could formerly boast of numerous state-of-the-art systems and practices – when compared to the private sector – the Department of Defense was now viewed in an unfavourable light as lagging behind contemporary, leading-edge corporate entities.

Adopting best business practices was recommended as the centerpiece of this reform initiative. These practices included a mix of specific initiatives, such the rapid leverage of information technology through embracing electronic business operations, a shift to electronic commerce in both finance and contracting, and the adoption of the

prime-vendor contracting approach utilized by major corporations. More generally, the report suggested that the use of the private sector models in both logistics and transportation would achieve efficiencies.

Streamlining defence through competition was the second key focus in the *Defense Reform Initiative Report*. This initiative concentrated on identifying the components of the military and civilian workforces that were of a commercial nature and opening these functions to competitive bids. Rooted in the longstanding philosophy that the federal government was not a competitor in commercial activities with the private sector, the report applied a framework that compared in-house bids with those of the private sector. Also prominent in the report was a number of organizational reforms, which largely involved shrinking quite substantially the size of military headquarters, defence agencies and the Office of the Secretary of Defense, as well as eliminating a broad range of infrastructure that was considered no longer necessary.

The *Defense Reform Initiative Report*, under a reform rubric, called for the dramatic transformation of the Department of Defense and Armed Services through the adoption of leading-edge business practices and the incorporation of the efficiencies of U.S. competition into defence. Yet, in a resource-constrained environment in which armed forces faced new and emerging threats, the necessity of reallocating resources from infrastructure and support to operations was deemed essential. Consequently, this initiative was, in effect, the launching of a revolution in business affairs to support the already ongoing revolution in military affairs.

To be sure, given the state of affairs at the time, the responsiveness of the acquisition and support functions to the shifting strategic environment was deemed critical. The ongoing transformation within the defence establishment in the United States was substantive. Both operational and support aspects of defence were changing simultaneously, while budgets were limited and the defence industrial base was declining. Indeed, the level of transformational ambition was significant; yet, success in the "new world order" could not be assured by following the military principle of "selection and maintenance of the aim" alone.

Rumsfeld's Challenge (2001)

In a speech at the Pentagon on 10 September 2001 to launch the Department of Defense's Acquisition and Logistics Excellence Week, Secretary of Defense Donald Rumsfeld addressed the serious threat posed to the security of the United States by an adversary close to home.

This adversary he described as the internal Pentagon bureaucracy. Institutional inertia within the department was viewed as a serious barrier to achieving an effective response to the changing environment. In addition, organizational processes were perceived as out of date and in need of modernization. Secretary Rumsfield viewed the forty-year-old Planning, Programming and Budgeting System as a "relic of the Cold War, a holdover from the days when it was possible to forecast threats for the next several years because we knew who would be threatening us for the next several decades."[14] Nevertheless, his call for transformation of defence echoed the recommendations that had been made repeatedly in the preceding years.

The private sector was held up as the role model for defence. Like "the private sector's best-in-class companies, DOD should aim for excellence in functions that are either directly related to warfighting or must be performed by the Department. But in all other cases, we should seek suppliers who can provide these non-core activities efficiently and effectively."[15] The private sector was highlighted as the "engine of technological innovation," a position formerly held by the American Department of Defense.

The need to streamline the defence acquisition system was another key point in Rumfield's presentation. Although nothing novel was introduced in this speech, it highlighted the approach of the U.S. administration to defence management. The speech, however, is of value because it illustrates the lack of continuity in addressing entrenched problems in the American defence acquisition system. Problems – largely the same problems – are identified repeatedly; many common solutions are advocated by learned and experienced observers, but yet the application of these solutions to persistent problems requires continuity and a long-term, stable plan to shift the acquisition system to more effective processes.

Defense Acquisition Performance Assessment (2006)

> Both Congress and the Department of Defense senior leadership have lost confidence in the capability of the Acquisition System to determine what needs to be procured or to predict with any degree of accuracy what things will cost, when they will be delivered, or how they will perform.[16]
>
> Assessment Panel of the Defense
> Acquisition Performance Assessment Project

The primary task assigned by the Secretary of Defense to the assessment panel of the Defense Acquisition Performance Assessment project was to provide recommendations for a defense acquisition system that provided "clear alignment of responsibility, authority and accountability."[17] The major findings of the report are listed in Table 1.1.[18]

The authors of the report argued that given the present unpredictable international security environment, agility in the acquisition system was essential in order to respond quickly to operational requirements. Indeed, timeliness emerged as a key parameter in the report, with the finding that the "Department of Defense's 'one size fits all' acquisition program structure does not meet the diverse capability and rapid time of delivery needs that are typical of a rapidly changing security environment."[19]

Another key theme of the report is the need for greater accountability. This theme is linked to the barriers that are imposed by the increasing complexity of the acquisition process and the need to orient the process more towards a program focus. The authors concluded that stability and continuity are essential parameters to success in the acquisition process and that improvements across all major system elements would be required in order to increase procurement effectiveness.

Table 1.1. Defense Acquisition Performance Assessment – Major Findings

- Strategic exploitation of technology is a key U.S. advantage.
- The U.S. economic and security environments have changed.
- The acquisition system must deal with external instability.
- The DOD management model is based on a lack of trust.
- Oversight is preferred to accountability.
- Oversight is complex, not process or program focused.
- Complex acquisition processes do not promote success; they increase cost and time.

Department of Defense Acquisition and Planning, Programming, Budgeting and Execution System Reform (2006)

Defence-acquisition-reform reports and studies in the United States have largely been the domain of the American government or the Department of Defense and their internally generated reports or commissioned

studies. One prominent recent exception is the report of the Center for Strategic and International Studies, *Department of Defense Acquisition and Planning, Programming, Budgeting and Execution System Reform*.[20]

This report eschews the narrow focus of many government-based reform studies and concentrates on the broad subjects of requirements, resource allocation (budgeting), and acquisition execution. It identified the enduring problem areas in American defence acquisition management. Indeed, the report emphasized that the defence acquisition system still lacked responsiveness, cost overruns continued, and capital projects experienced persistent schedule delays – subjects raised two decades earlier by the Packard Commission.

Recommendations to address these problems included restructuring the acquisition process to give each service clear responsibility and accountability for the execution of procurement programs; increasing technological leadership by extending the stature and span of control of technological organizations within the department in order to encourage and facilitate the perceived next technological evolution; rationalizing the rapid acquisition process; adopting time-certain development requirements (limiting the time a project can proceed through the acquisition process); and, finally, establishing risk-based source selection, streamlining the oversight, and stabilizing acquisition leadership.[21]

The report emphasized the importance of efforts to change the traditional operational-level oversight in program management to an approach that emphasized strategic governance. This report is a significant contribution to the analysis of defence acquisition reform in the United States because it was written by an independent American think-tank with particular expertise in defence policy and administration. As such, it provides a different, very useful, perspective than government agencies', departmental or other internal reports.

Defense Acquisition Transformation Report to Congress (2007)

The *Defense Acquisition Transformation Report to Congress* is an institutionalized biannual Department of Defense report on defence acquisition transformation established by the 2007 *John Warner National Defense Authorization Act*. The 2007 report focuses on key transformational activities and initiatives in the defence acquisition system within the elements of the departmental workforce; pilot acquisition programs; requirements; budget; the industry supplier base; and finally, organizational performance assessments and measurable priorities.[22]

The implementation plan for defence acquisition transformation is centred on seven goals, listed in Table 1.2.[23]

Table 1.2. Department of Defense Acquisition Transformation – Goals

- A high-performing, agile and ethical workforce
- Strategic and tactical acquisition excellence
- Focused technology to meet war-fighter needs
- Cost-effective, joint logistics support for the war-fighter
- Reliable and cost-effective industrial capabilities sufficient to meet strategic objectives
- Improved governance and decision processes
- Capable, efficient and cost-effective installations

The acquisition transformation goals listed in the report may appear at first glance to cover too disparate and broad a spectrum to provide for a coherent and broad-based evolutionary change. Yet, on closer examination, each goal is oriented towards reforming the specific elements that are the essential building blocks to enable substantive change.

One theme that may prove to be remarkably fortuitous is the need for concentrated decisions around the idea of cost-effectiveness, particularly in the current situation where large numbers of aging equipment will need to be replaced in the coming decades. However, achieving the key goal of improved acquisition governance and decision processes is often compromised when looked at solely from an internal departmental perspective; there needs to be a more broad-based national governance and decision-making process involving Congress and the Administration to achieve this goal.

Conclusion on U.S. Defence Acquisition Reforms

The need for change in defence acquisition was evident over two decades ago, and the resulting Packard Commission report set the foundation for subsequent reforms. However, the dramatic unleashing of ethnic, regional and religious tensions held in check by the bipolar world, and the uncertainty that this new warfare has brought to the United States and other nations over the past decade, dramatically increases the need for effective defence acquisition reform.

Critics of U.S. defence procurement reforms over the past several decades complain that these reforms "have focused on making incremental improvements to a narrowly defined acquisition process."[24] This approach minimizes the impact of measures taken to maximize declining procurement funding since the late 1980s. Falling budgets and the failure of incrementalism have forced an in-depth institutional examination over a number of years of how equipment is procured and, out of necessity, how costs could be reduced.

In the early 1990s the changed and unsettled international strategic environment brought shifts in the relatively stable operational demands on front-line military personnel. The predominance of asymmetrical conflicts and the multiplication of unconventional threats illustrated the changes that military personnel faced. These changes resulted in more frequent changes to statements of equipment requirements. More recently, advances in commercial products, a shrinking gap between these products, and products specifically produced according to inflexible military specifications became readily apparent.

The apparent compatibility of some public and military requirements and material made a compelling case for the defence department to look to the private sector for solutions, particularly in view of the speed with which commercial products having a high level of technology advanced. Linked to this phenomena was a marked difference in government and business procurement cycles, in which sluggish military procurement cycles took "as much as 2.5 times longer than commercial cycles" to complete an acquisition project.[25] Finally, regulatory barriers and the intense bureaucracy of defence procurement organizations were seen everywhere as barriers to firms considering entry into the defence sector.[26]

Despite the plethora of acquisition reforms that have been produced in the United States in recent decades, reform in this area may never be something that may be considered complete. From this perspective, acquisition reform in defence establishments "is perhaps better viewed as something that will always be a work in progress."[27] This effect should not overshadow improvements in understanding how the acquisition process works or the desire to shift to a more appropriate, focused defence acquisition system.

Perhaps the most important observation in this period is the significant transition from the emphasis in the 1990s on process reform to the prominence now given to the achievement of effective outcomes. The practical effect is that today departmental program managers are

dedicating less attention to how weapons systems are produced and more to what the program is intended to deliver.[28]

Assessments of the success of defence acquisition reforms in the United States are mixed and result from the several different visions and criteria for success in defence acquisition over time. Changes in governments invariably bring shifts in policy approaches, often challenging or reversing momentum that may have been achieved earlier. Specifically, "changing visions also create potential for less than full realization of change consequences, as change agents become overly focused on achieving some measure of change during their term in power."[29]

The major American defence reforms discussed above are summarized in Table 1.3.

Table 1.3. Major American Acquisition Reforms

Packard Commission (1986)	Management in defence and departmental decision making were the focus of the report. The acquisition process within the department and the level of Congressional oversight were also examined.
***Defense Reorganization Act* (1986)**	This Act implemented the majority of the Packard Commission's recommendations. The Service Acquisition Executive was established to provide civilian leadership in procurement, and procurement decision making was shifted to civilian jurisdiction.
Section 800 Report (1993)	The report focused on existing acquisition legislation. Its objective was to improve the efficiency and effectiveness of the legal framework in defence acquisition.
National Performance Review (1993)	This post–Cold War review advocated the use of commercial procurement standards for an increased number of defence acquisition programs.
***Federal Acquisition Streamlining Act* (1994)**	This Act consolidated numerous acquisition laws through the creation of a unified procurement code.
Defense Reform Initiative (1997)	The initiative concentrated on the impact of industry consolidation and the associated decrease in critical American defence industry capability.
Rumsfeld's Challenge (2001)	This challenge emphasized that advances in technology were moving faster than the department's capability to integrate them. Departmental planning processes were deemed to be obsolete and needed to be transformed to meet current demands. Best-in-class private sector corporations were held up as the model for defence to emulate.
Defense Acquisition Performance Assessment (2006)	The report emphasized the integrated nature of the acquisition process. The authors highlighted the unpredictability of the international security environment and viewed agility in the acquisition process as essential. The clear alignment of responsibility, authority and accountability was also stressed.
Department of Defense Acquisition and Planning, Programming, Budgeting, and Execution System Reform (2006)	This Center for Strategic and International Studies report eschews the narrow focus of many government-based defence acquisition reform studies, and concentrates on the broad subjects of requirements, resource allocation (budgeting) and acquisition execution. It also identifies the enduring problems in defence acquisition.
Defense Acquisition Transformation Report to Congress (2007)	This new biannual DOD report on defence acquisition transformation was institutionalized by the 2007 *John Warner National Defense Authorization Act* to report on the status of departmental acquisition transformation initiatives. The 2007 report focuses on key transformational activities and initiatives in the defence acquisition system within the elements of the departmental workforce, pilot acquisition programs, requirements, budget, the industry supplier base, and finally organizational performance assessments and measurable priorities.

CHAPTER 2

Defence Procurement Reform in the United Kingdom

Defence procurement reform in the United Kingdom coalesced in the 1980s and early 1990s under a number of emerging themes, which came together in the 1998 *Strategic Defence Review*. In the decade preceding the *Strategic Defence Review*, the national government underwent a dramatic shift in orientation with the widespread adoption of business practices, a greater emphasis on the expertise available in the private sector, and the desire to reduce public expenditure. The issue of "value for money" in defence contracts grew in prominence, and the use of competitive contracts increased. Efficiencies were sought through privatization, including creation of defence agencies and commercialization of other activities such as the Royal Dockyards.[30] Nevertheless, reforms in the U.K. to date have been reasonably evolutionary and consistent, notwithstanding that procurement reform has yet to achieve all that has been expected of it. Nevertheless, the Smart Procurement Initiative served to articulate emerging national procurement reforms in a coherent manner and to influence more recent reforms in the current decade.

Smart Procurement Initiative (1998)

As the Cold War was drawing to a close, a series of events in the United Kingdom served as a catalyst for significant procurement reform in that country. First, the ability of a succession of national governments to provide the armed forces with critical equipment capabilities on time and within budget had been limited. This failure was clearly articulated by the U.K. National Audit Office in 1997 in a report that examined the largest twenty-five equipment projects currently in progress. The report found that there was significant cost escalation

and that the provision of equipment programmed to enter service was, on average, three years behind schedule.[31] Second, corporate business models were changing, and this brought new procurement practices to government, as well as opportunities to enhance the manner in which equipment was acquired and maintained. Third, as in other Western countries, citizens in the U.K. were expecting a peace dividend from their government when the threat emanating from the Soviet Union disintegrated. In order to preserve combat capabilities, defence departments everywhere (including the U.K.) were examining ways to reduce the cost of support functions to allow for core capabilities. The result of this basic review was the renewal of the landmark *Strategic Defence Review*, tabled by the government in 1998.

A prominent component of the *Strategic Defence Review* was the Smart Procurement Initiative. The objective of smart procurement echoed the theme of procurement reform underway in the United States and aimed to deliver military equipment in the U.K. "faster, cheaper and better."[32] The existing procurement system was described as a key operational handicap to the armed forces, as the protracted procurement cycle meant that the U.K. was "not keeping pace with the rate of technological change which in many areas is now commercially led."[33]

The Smart Procurement Initiative aimed to increase project planning in the initial stages, with subsequent trade-offs between resources, time, and costs; strengthen the relationship between the Ministry of Defence and industry; stress emerging procurement methodologies; invest in improved estimates; and, finally, increase adoption of commercial practices in the defence establishment. The key elements of smart procurement are listed in Table 2.1.[34]

Table 2.1. Key Elements of Smart Procurement

- Fuller early planning of projects with appropriate trade-offs between military requirements, time and costs
- Partnering arrangements with industry
- Exploitation of new procurement techniques
- Improved estimating and predicting
- Improved commercial practices

In addition to "faster, cheaper and better," the *Strategic Defence Review* envisaged that the Smart Procurement Initiative would save the department approximately £2 billion over a period of ten years.[35] A key enabler of the initiative was the concept of Integrated Project Teams. These integrated teams would bring together all the relevant stakeholders of the equipment projects "under the clear leadership of a team leader able to balance trade-offs between performance, cost and time within boundaries set by the approving authority."[36] Significantly, the three environmental logistics organizations were integrated into a consolidated Defence Logistics Organisation, with the responsibility for in-service management of all military equipment.

Smart Acquisition (2000)

In October 2000 the Smart Procurement Initiative was renamed Smart Acquisition, with the intent of further developing the concepts introduced under the previous initiative. The objectives of Smart Acquisition are listed in Table 2.2.[37]

Table 2.2. Smart Acquisition Objectives

- Delivering projects that meet or better the time, cost and performance targets set when the decision to proceed with the project was made
- Acquiring capability progressively, at lower risk and with the right balance between military effectiveness, time and whole-life costs
- Cutting the time for key technologies to be introduced into the front line where needed to secure military and industrial advantage

The "whole life" approach to military equipment was emphasized in Smart Acquisition. Life began with concept development, moved to procurement, and continued through the full life cycle of the equipment. Public-private partnerships (PPPs) were viewed as a central component necessary to the modernization of public sector services. Consequently, the government introduced initiatives such as the Private Finance Initiative and declared "partnering and outsourcing are at the heart of the PPP concept, and under Smart Acquisition the MOD has fully endorsed the use of these tools for providing services throughout the Department."[38]

The Smart Procurement Initiative and the follow-on Smart Acquisition were distinctive in that they shifted the relationship with industry from one of competition between firms to one of a long-term partnership between a few. Given the sharp decline in numbers of major defence firms immediately following the end of the Cold War and the partnering with specific firms over multiple years, this form of contractual arrangement has the potential to accelerate the decline in prospective defence firms in later years. In addition, of course, the smaller the supply of defence firms, the greater the potential for cost increases and lagging industry efficiency gains, as defence demands grow. Indeed, critics of Smart Acquisition contend that "the solutions it introduced are creating problems of their own that challenge some of the fundamentals of Smart Acquisition thinking."[39]

Advocates of Smart Acquisition point to perceived enhancements in the acquisition cycle, whereby significant planning and decisions would occur quite early in the cycle. This accelerated cycle would provide opportunities to make necessary trade-offs between requirements, costs and time. Yet further difficulties appeared in the two key considerations of follow-on acquisition processes.

Incremental acquisition is a fundamental component of the Smart Acquisition process. The concept, unfortunately, makes the establishment of firm requirements challenging and precise cost estimates problematic. Indeed, in the initial stages of a weapon systems project under the incremental acquisition process, substantive cost estimates are generally limited to initial system capability, and costs of future planned development cycles become only indicative at best.

Defence departments in Western nations have traditionally procured military equipment and kept them in service for decades. The combination of obsolescence, changes in technologies, and usage of this equipment means that military forces will want to upgrade, or modify, their equipment at one or more points during its in-service life. In a resource-constrained environment where capital dollars must be spread between making new acquisitions and upgrading existing equipment, obtaining funding for upgrades is challenging. In reality, the contest for resources often causes the postponement of planned upgrades funding. Despite the unimpressive historical record of defence forces in upgrading their equipment, Smart Acquisition envisions increasing the frequency of equipment modifications to increase the pace with which advances in technology are introduced into front-line weapons systems. To achieve this ambitious goal requires sustained government support and appropriate (usually increased) funding levels.

A central feature of Smart Acquisition was the reorganizing of the defence materiel workforce. This reorganization was "intended to improve acquisition by moving from a functional to a project-based organizational structure."[40] The key organizational construct was the Integrated Project Team (IPT). This approach envisaged that an integrated project team would be formed at project inception and remain with the capital equipment throughout its life cycle until its disposal. This cradle-to-grave approach, however, proved to be impractical[41] with some IPTs responsible for developing, procuring and delivering equipment and others responsible for managing the equipment in service. Experiences showed that the type of skills required in individual IPTs shifted in accordance with the state of the project and that of the equipment life cycle.

Ministry of Defence's Departmental Investment Strategy (2004)

In 2004 the Ministry of Defence released the *Departmental Investment Strategy*[42] as part of Spending Review 2004. Smart Acquisition received continued endorsement, with its application in the process of being "broadened to embrace all forms of acquisition in the Department, including services, estates and business information systems, rather than just equipment capability."[43] The *Departmental Investment Strategy* also emphasized the importance of "private finance initiatives" in government decision making regarding major capital projects that necessitated a significant capital investment. Benefits accorded to private finance initiatives included private sector project-management skills and more innovative risk-management expertise, and design capabilities. A corporate Private Finance Unit was established to manage the development and approval of private finance initiatives. Projects that required either providing or refurbishing major capital assets, along with certain long-term services that had clearly defined outputs, were deemed primary candidates for private finance initiatives.

The Rapid Procurement of Capability to Support Operations (2004)

The United Kingdom's rapid procurement of capability was the subject of a report in November 2004 by the National Audit Office entitled *The Rapid Procurement of Capability to Support Operations*.[44] This timely report highlighted the increasing prevalence of urgent

operational requirements (UORs) in the type of operations that Western military forces were undertaking in the fast-evolving international security environment. Indeed, "the varied nature of operations and operational environments that may be encountered and the different strategies that may be employed mean that existing capabilities often need to be procured rapidly to fill previously unidentified gaps."[45]

Urgent operational requirements, by their very nature, drive the convergence of activity to rapidly procure capability in support of operations. What is key is that this activity brings together disparate groups within the department, armed forces and industry to solve problems – and implement solutions –on a short time scale. Relationships are formed, and unity of purpose develops. From this perspective, urgent operational requirements are progressed in stark contrast to the plodding and deliberate pace of the traditional defence capital acquisition process. Table 2.3 lists the potential uses of the urgent operational requirements process.[46]

Table 2.3. Uses of Urgent Operational Requirements

- Procuring operationally specific capabilities
- Procuring equipment to fill previously unknown capability gaps
- Accelerating a programme already in progress
- Patching a gap until an already funded solution comes into service
- Filling a previously identified gap that has not been funded

The National Audit Office report is unusual – at least, in Canadian terms – in that it steps forward in its final main section from merely being an audit and evaluation document to providing a joint framework developed with both external consultants and the department to improve departmental UOR processes and tasks. Nine specific activities were identified within the UOR process. The recommendations in the report can serve to enhance the UOR process, as well as inform the broader defence acquisition community through a type of lessons-learned process how to move significant capital projects forward faster. For example, the report suggests ways in which a defence industrial strategy can incorporate some of the successful techniques and processes of the UOR process into broader national acquisition strategies.

Defence Industrial Strategy (2005)

In December 2005 the British government released a Defence White Paper entitled *Defence Industrial Strategy*.[47] The aim of *Defence Industrial Strategy* was to link the needs of the Ministry of Defence to the national defence industrial base in order to best meet the requirements of the military forces. Continuing on the theme of "faster, cheaper and better," *Defence Industrial Strategy* was geared to ensuring that a sustainable national industrial base was maintained. It was divided into three distinct sections: the first section provided a strategic overview of the global security environment; the second section reviewed each significant defence-related industrial sector, as well as pertinent cross-cutting industrial capabilities; and the final section concentrated on how *Defence Industrial Strategy* would be implemented.

The strategic overview highlighted the changes in the international strategic environment since the end of the Cold War. Given the interrelated set of factors considered, the government perceived that it was at a crossroads. Specifically, the government concluded that the armed forces were transitioning to a series of new major platforms that would then be in service for a very long period of time. Consequently, the defence department would require industry not only to support that equipment throughout its service life but also to regularly upgrade it. The department would also require capabilities to insert new technology quickly into older equipment to meet emerging threats.

The importance of both the evolving defence market and the domestic business environment was recognized and addressed in the report. The section concluded by identifying key industrial capabilities that the government desired to sustain, while recognizing that both priorities and the security environment could change. The review of the industrial sectors included maritime; armoured fighting vehicles; fixed wing aircraft; helicopters; general munitions; complex weapons; Command, Control, Communication and Computers, Intelligence, Surveillance, Target Acquisition and Reconnaissance (C4ISTAR); Chemical, Biological, Radiological and Nuclear Force Protection (CBRN); counter-terrorism; test and evaluation; and technologies that enabled defence capabilities. The final section applied the efforts of the preceding two chapters to an implementation strategy.

It is significant that this policy document endorsed the basic principles of Smart Acquisition by taking the foundation provided by Smart Acquisition and building the future approach to acquisition "around

achieving primacy of through life considerations; coherence of defence spend across research and development, procurement and support; and successful management of acquisition at the departmental level."[48]

Defence acquisition reform in a nation has the objective of improving the methods and processes in which capital equipment is bought and managed by defence departments. Nevertheless, unless this reform is supported and facilitated by associated actions in interrelated areas, benefits of this reform will be limited. Indeed, in the case of the United Kingdom, the lack of adequate funding to implement the *Defence Industrial Strategy* has for the most part negated the positive impact that this welcomed strategy had on release. Although the government has put in place both a structure and guiding principles for a defence industrial strategy, without sufficient funding the U.K. defence industry will continue to experience declines in capability.[49]

Enabling Acquisition Change (2006)

The report entitled *Enabling Acquisition Change: An Examination of the Ministry of Defence's Ability to Undertake Through Life Capability Management*[50] was a deliberate shift in concentration from the traditional focus on equipment acquisition to a focus on the costs of maintaining and supporting the equipment throughout its in-service life cycle. The report centres its attention on the structure of the department, its organization, and the processes followed within it. The report also highlighted the historical "conspiracy of optimism" within the Ministry of Defence; the misalignment of target and incentives; and "stove-piped" behaviour. Of particular concern were institutional boundaries between organizations that hindered the effectiveness of life-cycle management; the enhancement of essential workforce skills; and a unity of purpose required within the acquisition community.[51]

The report recommended a more strategic defence-budget view across a ten-year period and beyond; more realism in planning; the programming of equipment operating costs a decade into the future; the merging of the Defence Procurement Agency and the Defence Logistics Organisation into an integrated procurement and support organization; and increased concentration on risk management and oversight of major investment decisions. The report highlighted the conclusion that despite the concentrated effort for close to a decade on improving acquisition processes, much more work remained to be done to achieve the government's overall objectives.

Conclusion on U.K. Defence Acquisition Reforms

The United Kingdom has charted a remarkably consistent course in defence acquisition reform since the Smart Procurement Initiative was introduced in 1998. Nevertheless, the evidence, to date, from "Smart Procurement/Acquisition is that these initiatives have rarely delivered the complete scope of expected benefits."[52] Yet, this conclusion must be seen in the context of improvements that have been made in the acquisition system over the past decade.

The most substantive benefit of the British approach is the combination of relative stability in the system – once it was implemented – and the value of subsequent incremental enhancements under the Smart Acquisition framework. Stability of approach is a key enabler to lasting change. Nevertheless, management – or process – changes are in themselves not the complete solution. Indeed, adopting private sector processes in isolation is not a panacea. Procurement within the private sector is distinguished by certain market incentives that are absent in the public sector. Likewise, elected politicians of all stripes have their own interests in these matters, and they usually centre on incentives to support defence contracts in their constituencies, irrespective of the costs.

The continuing problems identified in the 2006 *Enabling Acquisition Change* report highlight the difficulty of effecting change in defence processes, notwithstanding considerable efforts that may be made to undertake those changes. The U.K. has, in effect, adopted an incremental approach to defence acquisition. To begin with the procurement process and then expand to the in-service life of the equipment has a conceptual appeal. Subsequent phases addressed the need for future upgrades of existing equipment and the emergence of urgent operational requirements as an enduring feature of the current operational environment. Finally, this acquisition reform was linked to defence industrial strategy. With regular feedback on developments, the U.K. defence acquisition model provides one approach to defence acquisition reform. The British defence reforms discussed above are summarized in Table 2.4.

Table 2.4. Major British Acquisition Reforms

Smart Procurement Initiative (1998)	The objective of Smart Procurement echoed the theme of procurement reform underway in the United States and aimed to deliver military equipment in the U.K. "faster, cheaper and better." The existing procurement system was viewed as a key operational handicap to the armed forces, as the protracted procurement cycle meant the U.K. was not keeping pace with the rate of commercially led technological change.
Smart Acquisition (2000)	The Smart Procurement Initiative was renamed Smart Acquisition with the intent of further developing the concepts introduced under the previous initiative. The whole-life approach to military equipment was emphasized, and public-private partnerships were viewed as central to the modernization of public sector services.
Ministry of Defence's Departmental Investment Strategy (2004)	Smart Acquisition received continued endorsement. Its application was broadened to embrace all forms of acquisition in the department, including services, estates and business information systems, rather than just equipment capability.
National Audit Office's Report: The Rapid Procurement of Capability to Support Operations (2004)	This timely report highlighted the increasing prevalence of urgent operational requirements in the type of operations that Western military forces were undertaking in the current evolving international security environment. Urgent operational requirements, by their very nature, drive the convergence of activity to rapidly procure capability in support of operations.
Defence Industrial Strategy (2005)	The aim of *Defence Industrial Strategy* was to link the needs of the Ministry of Defence to the national defence industrial base in order to best meet the requirements of the military forces.
Enabling Acquisition Change (2006)	The report recommended a more strategic defence budget view across a ten-year period and beyond; more realism in planning; the programming of equipment operating costs a decade into the future; the merging of the Defence Procurement Agency and the Defence Logistics Organisation into an integrated procurement and support organization; and increased concentration on risk management and oversight of major investment decisions.

CHAPTER 3

Defence Procurement Reform in Australia

Australia is unique among Western-oriented nations because of its particular location in the Asia Pacific region, its size and primary export markets for goods and services. The considerable distance between Australia and allied Western nations necessitates a certain level of indigenous support for the defence industrial base in Australia. Furthermore, the extensive geographical mass of the island nation makes the country – like Canada – both secure and indefensible. Again similar to Canada, although the protection of the country takes precedence, the focus of the Australian armed forces is deployed operations. Given the similarities and differences between Canada and Australia, the approach chosen by the national government in Australia makes for an interesting comparison to that taken by Canadian governments. Indeed, it demonstrates that national governments make particular choices,[53] a fact that is not adequately acknowledged.

Defence procurement reform in Australia in the post–Cold War era began with the Defence Reform Program in 1997 and continued through to the Defence Procurement and Sustainment Review in 2008. Over this period of dramatic change and active involvement by the Australian military in overseas operations, the focus of procurement reform – as in the case of the United Kingdom – has been remarkably consistent. Yet, the Australians have chosen a distinctly national approach to defence acquisition reform, shaped in part by their unique geopolitical situation.

Defence Reform Program (1997)

The management framework of defence in Australia for the past decade was largely established by reforms instituted by the 1997

Defence Reform Program.[54] The objective of the reform program was three fold: first, to consolidate individual Service support and training activities to increase efficiencies; second, to improve management effectiveness by merging headquarter functions; and third, to produce savings through the sale of surplus defence properties. These reforms resulted in a relatively centralized structure, with individual Services left with limited control over numerous military capability inputs.[55] Although the Australian Defence Reform Program was not centred on acquisition reform, it did provide the foundation for the management framework under which subsequent acquisition-related reform would take place.

Defence and Industry Strategic Policy Statement (1998)

The 1998 *Defence and Industry Strategic Policy Statement* was noteworthy in that it explicitly linked defence policy at the strategic level with industrial policy at the national level. The statement provided a clearly defined policy framework that unequivocally identified Australian industry as an integral element of national defence capability. Indeed, the Australian Defence Force and industry were heralded as partners in the provision of national security. The 1998 *Defence and Industry Strategic Policy Statement* offered six strategies (listed in Table 3.1) to integrate the military and the defence industry better. In addition, forty-nine significant initiatives were identified to support the implementation of the policy.

Table 3.1. Six Strategies to Integrate the Military and Industry Better

- Integrate industry into capability development
- Enhance industry's contribution to the nation's capability edge
- Reform procurement
- Establish new ways to involve Australian industry in defence business
- Increase Australian exports and materiel cooperation
- Commit to cultural change and improved communication

A key initiative contained in the *Defence and Industry Strategic Policy Statement* was the building of a mechanism to move formally to

a less adversarial relationship between the defence establishment and defence firms. While this approach was common in Western nations during the period, in Australia it was framed as "partnering." The statement took the position that "partnering has become increasingly common in the private sector, where it has been found to reduce cost and schedule runs, encourage innovation, and make risk more manageable. Partnering can produce similar benefits for Defence." [56]

The objective of this desired partnership was to link defence and industry together in a relationship where both risks and rewards were shared. Given the significant problems faced by defence planners at the time, the potential advantages of collaborative problem solving with industry were an attractive prospect, as was the possibility of transferring some risk to industry. Nevertheless, overcoming the long history of sometimes difficult relationships between these two parties was a significant undertaking.

Few saw the strategy as a panacea that would resolve entrenched problems such as cost overruns or schedule slippage, even though the policy framework did provide both industry and defence an explicit policy-based framework within which to improve their relationship. Defence policy statements related to domestic industry provide direction to the defence department on how to relate to industry and are successful to the extent that the guidance is explicit and the implementation period provides time for the relationship to develop and mature. In the case of the 1998 *Defence and Industry Strategic Policy Statement,* the six strategies generally provided a suitable framework for industry and defence collaboration.

Defence 2000: Our Future Defence Force (2000)

The 2000 Defence White Paper, *Defence 2000: Our Future Defence Force,* continued the reforms begun in 1998 with the *Defence and Industry Strategic Policy Statement* and committed to organizational stability by providing significant, long-term additional funding. The Australian government's commitment to the defence industrial base was re-emphasized, with priority given to combat and system software and support as well as data management and signal processing. In-country support for repair, maintenance and modification of military equipment was also identified as a priority.[57] In particular, support for advanced technology was viewed as a key underpinning of the government's approach to the defence industry. However, in a nation outlaying only

one percent of world military expenditure,[58] this appears to be an improbable objective. Similarly, government support for defence exports – given their small market size – also appears to be overly ambitious.

A key decision announced in the White Paper, related to acquisition reform, was the adoption by the Defence Materiel Organisation of commercial best practices as the standard organizing principle. In addition, performance standards in the Defence Materiel Organisation would be measured against industry benchmarks. Furthermore, to improve the relationship between defence and industry, the defence department was given the responsibility of encouraging a closer relationship between the parties.

Defence Procurement Review (2003)

After a wide-ranging review of the national acquisition process, the 2003 *Report of the Defence Procurement Review* concluded that "there is no single cause of the failures that have become apparent in the development of capability and the acquisition and support of defence equipment. Consequently, there is no single remedy that will ensure that problems do not occur in the future."[59] This review both continued and re-emphasized the procurement reform begun in the preceding decade. Taking a more broad-ranging view, however, and mindful of the new and emerging threats in the international security environment, the report urged more rapid change, while stressing the need to fundamentally remodel existing structures, departmental systems and the culture inherent within the defence department. Specifically, the review emphasized that changes were needed within each phase of the acquisition process, as well as throughout all subsequent in-service life-cycle phases.

This review echoed defence reports in other Western nations and emphasized the importance of improving the departmental process for defining and assessing capability requirements. It followed similar approaches recommended in the United Kingdom, including an increased investment in the early stages of program development and a special emphasis on technological, schedule and cost risks. The Australian review emphasized, especially, the importance of cost analysis for both acquisition and subsequent life-cycle costs.

In a period of change within any organization, external advice and support is usually beneficial. The report recommended two important initiatives in this regard. First, it recommended the establishment of an advisory board, independent of operational processes, to "provide the

advice of people who have acquired business skills and experience in the private sector"[60] to senior managers in defence acquisition. The board, it was assumed, would consequently enhance the commercial orientation within that department. Second, the report recommended that the mandate of departmental project governance boards shift from managing simply acquisition to managing both acquisition and through-life support in order to provide continued oversight of fleet operating costs.

Finally, despite the extensive changes proposed in the report, one innovation specifically, making the use of off-the-shelf acquisitions a key project benchmark, has the potential to cause a positive, enduring change. In this regard, the report states:

> Off-the-shelf equipment is often cheaper and can usually be delivered faster. Accordingly, an off-the-shelf alternative must be part of any set of options put forward to government to ensure that a benchmark is established against which the costs, military effects, and schedule of all proposals can be assessed.[61]

Report on the Inquiry into Materiel Acquisition and Management in Defence (2003)

The terms of reference of the 2003 *Report on the Inquiry into Materiel Acquisition and Management in Defence* by the Foreign Affairs, Defence and Trade References Committee centred on whether the existing defence materiel acquisition and management framework was effective in fulfilling military equipment requirements.[62] Although the terms of reference were reasonably broad, the report was essentially a snapshot of a year and a half of reform following the December 2000 Defence White Paper.

Although the objective was to develop a series of benchmarks to facilitate measurement of the success of future materiel acquisition and management reforms, the report recommendations were quite narrow in their application. In essence, given the short time since the reform process had been initiated by the Defence White Paper of 2000, these fundamental observations on reform core processes or functions were made too soon and were, thus, only preliminary. Nevertheless, the broad consultation of the committee and the examination of the reforms made to date did bring forward a number of appealing ideas.

The unequivocal Australian government endorsement of close links between government and the defence industry, and following the 1998

Defence and Industry Strategic Policy Statement that explicitly encouraged Australian industry to be proactive in presenting ideas and innovations to the department of defence, resulted in the committee recommending "an efficient formal mechanism for the promotion and handling of unsolicited proposals"[63] from small and medium Australian enterprises. This innovative approach to doing business was intended to help leverage the "knowledge edge" of primary leaders in a range of defence technology fields.

The committee endorsed the merits of defence partnerships and alliances with industry, while recognizing that both partners needed expertise in managing their relationship and negotiating effective, collaborative joint ventures. The committee acknowledged the efficiencies and benefits that a competitive market can bring to defence acquisition, noting that the Australian government policy commitment to partnerships could impede future competition among potential suppliers.

To counter potential decreases in future long-term contracts, the committee recommended that the department "remain in regular contact with the unsuccessful bidders."[64] The committee envisaged regularly updating, from government to firms, with any changes to capability requirements during the long-term contract, informing of developing strategies, and assisting potential future suppliers to be in a competitive posture at the contract renewal point. While this approach may not always succeed in maintaining competition in specific markets, it demonstrates government transparency and counters perceptions of preferential treatment towards the existing contractor. In a country with a defence industry the size of Australia's, it is imperative that the government nurture and encourage competitive firms in the defence sector, and governments have done this through an ongoing dialogue with corporations in that sector.

Parliamentary oversight of the defence capital program and the publication of detailed program information are indispensable to providing the visibility and transparency of projects. To this end, the committee recommended an annual progress report on major capital projects that would include project costs, time frames, technical performance data, and an analysis of project performance and trends.

Defence and Industry Policy Statement (2007)

The 2007 *Defence and Industry Policy Statement* builds on the foundation established by the 1998 *Defence and Industry Policy Statement*.

The 2007 policy statement stresses the necessity of a domestic defence industry that is capable of simultaneously maintaining, repairing and modifying fleets purchased from external markets, while ensuring the ability to design and manufacture equipment domestically according to unique Australian Defence Force requirements. While acknowledging the underpinning of the 1998 policy statement, the document criticizes the lack of vigour in the implementation of that policy.

Nevertheless, the 2007 *Defence and Industry Policy Statement* endorses too many dissimilar policy objectives, some of which appear to be contradictory. Specifically, the diverse objectives of securing value for money and concurrently creating opportunities for Australian firms are both endorsed. Indeed, the expectation that a country with the economy and population of Australia could simultaneously support a domestic defence industry that can give priority to local industry capabilities, create opportunities for Australian businesses, encourage small and medium indigenous enterprises, as well as facilitate defence exports is not realistic in the current internal defence weapons market dominated by the United States and, to a lesser extent, some European firms, and a resurgent Russian defence industry.

Although the scope of the policy statement may be too broad, the emphasis of early joint government and industry engagement in project development in order to clarify capability requirements, refine costs and identify project risks together is well placed in the current international strategic environment. In addition, the report recognizes the impact of globalization and post–Cold War commercial realities in the defence sector. The importance of membership in multinational weapons systems programs is acknowledged, and increased use of commercial off-the-shelf technology within military applications is again emphasized.

Defence Procurement and Sustainment Review (2008)

The 2008 *Defence Procurement and Sustainment Review* is a formal evaluation of the Defence Materiel Organisation within the Department of Defence, which aims to determine the effectiveness of reforms implemented subsequent to the 2003 *Report of the Defence Procurement and Sustainment Review*. The Australian government's expectations of the defence procurement and sustainment systems were four fold: first, achieve superior results for the Australian Defence Force; second, shift to enhanced transparency and accountability; third, move

to superior efficiency and effectiveness; and fourth, obtain better value for money.[65] Although it was acknowledged that the reforms advocated in the 2003 *Defence Procurement and Sustainment Review* had improved the procurement system over the ensuing five years, the desired outcomes had not been fully achieved. Consequently, this report proposed a number of further defence procurement and sustainment reforms to the existing system. Significantly, they "can be characterized under the themes of making the Defence Materiel Organisation more business-like and imposing discipline on the defence procurement and sustainment processes."[66] The report identified five principal areas of concern (see Table 3.2).[67]

Table 3.2. Procurement and Sustainment: Principal Areas of Concern

- Inadequate project management resources in the Capability Development Group
- Inefficiency of the process leading to government approvals for new projects
- Shortages in Defence Materiel Organisation personnel
- Delays due to inadequate industry capacity
- Difficulties in the introduction of equipment into full service

Although the review was geared towards progressing defence procurement reforms initiated in the preceding decade, and the majority of recommendations followed from that theme, a number of them have the potential to make a distinct difference. First, oversight is strengthened through the recommendations to establish an independent Project Performance Office and an independent Sustainment Efficiency Office. The proposed role of the Project Performance Office is to review projects, as well as to facilitate problem solving within projects, where necessary. The proposed role of the Sustainment Efficiency Office is to benchmark and to explore methods to enhance the delivery of sustainment to the military. Finally, the review recommended the dismantling of artificial – yet historical – financial barriers between procurement and sustainment budgets when deciding to purchase new equipment or maintain existing equipment. The primary financial consideration would be directed at subsequent life-cycle operating costs.

Conclusion on Australian Defence Acquisition Reforms

Australia, like the United Kingdom, has charted a distinctly national and consistent course in defence acquisition reform since the 1997 *Defence Reform Program*. Prominent throughout this period has been the relationship between the defence department and industry. Indeed, the clearly defined policy framework linking national defence capabilities and Australian industry has largely endured throughout the past decade. The benefit of this policy was that it provided defence and industry with a structure to improve their relationship. Although perhaps somewhat ambitious given the relatively modest size of the Australian defence industry and the changes that were occurring in the defence sector globally during this period, it did cater predominantly to the unique geographical and security circumstances of the country. The distinctively national approach taken with industry was complemented by the adoption of a number of defence acquisition reforms implemented by the United States and the United Kingdom. This consisted of embracing commercial best practices, taking a whole-life approach to equipment, increased investment early in procurement programs, and enhanced program oversight.

Table 3.3. Major Australian Acquisition Reforms

Defence Reform Program (1997)	Although the Australian *Defence Reform Program* was not centred on acquisition reform, the management framework under which subsequent acquisition-related reform would take place was established.
Defence and Industry Strategic Policy Statement (1998)	A clearly defined policy framework was established that unequivocally made Australian industry an integral element of national defence capability.
Defence 2000: Our Future Defence Force (2000)	This White Paper continued the reform begun in 1998 with the *Defence and Industry Strategic Policy Statement* and committed to organizational stability by providing significant long-term additional funding.
Defence Procurement Review (2003)	Taking a more broad-ranging view, and mindful of the new and emerging threats in the international security environment, the report urged more rapid change, while stressing the need to fundamentally remodel existing structures, departmental systems, and the culture inherent within the organization. One innovative proposal was to make off-the-shelf-acquisitions a key project benchmark.
Report on the Inquiry into Materiel Acquisition and Management in Defence (2003)	Given the short time frame that the reform process had been in progress since the Defence White Paper, fundamental observations on reform core processes or functions were preliminary. In addition, the committee recommended the establishment of a formal mechanism for the promotion and handling of unsolicited proposals, as well as an annual progress report on major capital projects.
Defence and Industry Policy Statement (2007)	The policy statement stressed the necessity of a domestic defence industry that is capable of simultaneously maintaining, repairing and modifying fleets purchased from external markets, while ensuring the ability to design and manufacture equipment domestically according to unique Australian Defence Force requirements.
Defence Procurement and Sustainment Review (2008)	The reforms proposed in the report "can be characterized under the themes of making the Defence Materiel Organisation more business-like and imposing discipline on the defence procurement and sustainment processes." In addition, improved oversight through the establishment of an independent Project Performance Office, as well as an independent Sustainment Efficiency Office, was proposed.

CHAPTER 4

Summary of Defence Acquisition Reform in Other Nations

> While DOD maintains military forces with unparalleled capabilities, it continues to confront pervasive, decades-old management problems related to its business operations – which include outdated systems and processes – that support these forces.[68]
>
> United States Government Accountability Office

Although all countries discussed in this section shared the same international strategic environment, their individual national responses to reform of the defence acquisition process during this period were different. Each of the three nations' examinations of their recent approach to defence procurement reform were distinctly national. There were, however, a number of common themes concerning structural, legal and procedural changes. Indeed, it is not the differences but the commonalities that have defined defence procurement reform in recent decades.

In effect, each nation has taken a unique path to arrive at similar, desired objectives. Yet, the strategic, business, and procurement environments were also changing at a rapid pace, leaving the defence establishment continually struggling to keep pace. This reality broadened the scope of needed reform and ushered in a series of further studies aimed at better aligning acquisition processes with the needs of operational military units. What is noteworthy is that the pace of change does not appear to be abating. Consequently, a series of further defence acquisition reforms can be expected on the horizon as defence departments continue to strive towards a closer alignment of military operational requirements and delivery of timely new operational capability through the acquisition system. These themes are listed in Table 4.1.

Table 4.1. Enduring International Themes in Defence Acquisition Reform

Policy
- Establishment of a defence industrial strategy
- Parliamentary oversight of the defence acquisition system
- International collaboration
- Close links between government and industry
- Use of an advisory board for defence acquisition

Management
- Clear responsibility and accountability
- Effective project governance regimes and decision processes
- Configuration of technology to meet military needs
- Stable acquisition leadership

Private Sector Practices
- Use of best-in-class private sector practices
- Use of commercial products and processes
- Improved cost-estimating practices
- Consideration of both acquisition and in-service costs in decision making
- Responsiveness of the acquisition system

The enduring themes in defence acquisition reform throughout the past two decades are perhaps not evident to the casual observer, or even to those working within defence department procurement organizations. In a period of constant change it is imperative that all parties in this field understand the shifting landscape and be capable of responding appropriately. Defence acquisition reform consists of three distinct, yet interrelated, themes. In the current procurement environment, policy can and does make a difference. The role played by policy is integral to setting the appropriate conditions to facilitate success. An active policy regime also engages Parliament and intensifies the relationship between the defence department and government. Policy also establishes the parameters for departmental management of the defence acquisition process. Effective management through clear lines of communication, accountability and authority can make a difference, as can stability in project management leadership. Finally, knowing, understanding and applying emerging leading-edge private sector practices is vital to improving performance metrics.

CHAPTER 5

Joint Multinational Government Defence Programs

> An Alliance of 26 nations can only effectively work together in joint operations if provisions are in place to ensure smooth cooperation. NATO has been developing this capability, known as interoperability, since the Alliance was founded in 1949. The ability of NATO militaries to work together has become even more important since the Alliance has begun mounting out-of-area expeditionary operations.[69]
>
> North Atlantic Treaty Organization

The North Atlantic Treaty Organization (NATO) has a longstanding standardization policy for both equipment and materiel.[70] This is most evident in the common NATO stock number codes used by all alliance member states, a device that facilitates the exchange of spare parts and materiel during joint operations. Alliance interoperability doctrine is firmly entrenched among NATO members and is enhanced through deliberate collaboration, a fact well understood as being in the best interest of all alliance members.

Collaboration in NATO is illustrated by the NATO Maintenance and Supply Agency (NAMSA). This agency was established in 1958 to "assist NATO nations by organizing common procurement and supply of spare parts and arranging maintenance and repair services necessary for the support of various weapons systems in their inventories."[71] Although there are some barriers to international collaboration, such as the influence of domestic politics, from an economics perspective joint multinational defence programs are fundamental to cost-effective capital projects. As an example, an equal four-country collaborative weapons system project would result in national research and development costs

declining by three-quarters over a single country project, and unit costs for the weapons system decreasing with the larger, four-country market for the weapons system.[72]

Indeed, national policies in Canada, the United States, the United Kingdom and Australia are universal in their advocacy of international joint weapons system projects.[73] The benefits can be significant for all parties involved. From a simply economic perspective, the economies of scale that can be generated by a number of nations purchasing a specific weapons system make a persuasive case for nations to pursue this course of action. Add on other potential benefits from research and development, sub-contracting and assembly, as well as economic spinoffs, and the case for international collaboration is even more substantial. Furthermore, both the cost savings and the work that these projects can bring to the defence industrial base are important considerations. Given these attributes, why is collaboration in international weapons system programs not more pervasive? The answer lies in entrenched national processes and procedures, as well as domestic political considerations, that are tenaciously resistant to change.

Under the current circumstances the relative scarcity of major international collaborative weapons system projects – when compared to the large number of national projects – is potentially increasing per-unit costs, multiplying the number of military and departmental civilians working on capital projects nationally, short-changing the defence industrial base of the opportunity for international contracts, and limiting the ability to support and upgrade national systems effectively. In the current capital acquisition environment, with military forces purchasing increasingly smaller quantities of replacement weapons system fleets – even if those systems are more capable – procuring and maintaining small fleets can be cost prohibitive.

Once weapons systems are purchased, they regularly remain in service for several decades, and life-cycle costs and upgrading can be very expensive. However, when several nations hold the same equipment, unit costs can be reduced and spread out across several nations. Indeed, weapons systems designed for use in an asymmetric environment, such as vehicles to counter the threat of improvised explosive devices (IEDs), employ relatively new and rapidly changing technology, and frequent upgrades to incorporate this technology are essential. Consequently, obtaining the benefits of international collaboration against the threat of IEDs and inserting this technology quickly into vehicles is the type of benefit that can accrue from such projects in the

future. These benefits are so central to the capabilities required in the types of conflicts in which Western military forces continue to be involved for the foreseeable future that historical barriers to international collaboration need to be overcome. Moreover, it may now be appropriate to consider developing an integrated alliance capitalization plan within NATO.[74] Alternatively, defence convergence criteria[75] related to international collaboration in capital projects can be established as a point of reference, and then developments measured against specific criteria.

> In terms of volume, more than 90 percent of international spending on U.S. Navy equipment and services is done by just 15 percent of the countries who buy their maritime defense articles from the U.S. These countries have the means to buy the most modern capabilities available, and in many cases, they have been doing so for a long time.[76]

The American Foreign Military Sales program has supported the U.S. defence industrial base for decades. Indeed, American foreign military sales increase the military capabilities of allies and enhance interoperability. In a market with fewer competitors, resulting from over a decade of industry consolidation and advanced research and development, American multinational defence corporations will continue to face a greater geographical spread of those subcontractors providing components and technical expertise. As well, partnering with different firms will increase as technologies transition through the equipment life cycle. Thus, greater international cooperation and collaboration can be expected in the future. In addition, the challenging economic market will force nations, out of necessity, to increase their collaboration in an effort to stretch limited procurement dollars. These factors will necessitate early engagement by all nations to leverage and merge individual national developments in certain fields. The key to international collaboration is for countries to identify their requirements far enough in advance in order to facilitate research and development on a cooperative basis and then combine resources in an apportioned manner for subsequent testing and production.[77] In the current environment, with NATO and partner nations working closely in deployed operations in distant locations such as Afghanistan, interoperability is a prime consideration.

The primary motivations for international collaboration in defence programs have traditionally been a mix of economic, military and political factors. However, the necessity for governments to deal with continuing defence industry consolidation has recently been linked to the onset of a severe recession in 2009 for a number of countries.

Consequently, in the current economic climate, defence dollars are competing for funding not only with the usual social, health and industry programs but also with additional economic stimulus programs to assist struggling Western economies. Thus, international collaborative programs facilitate the leveraging of defence dollars and can be promoted by governments as cost-effective initiatives. Nevertheless, the current economic climate may exacerbate the potential for protectionist tendencies in some countries.

The increasing propensity for Western military forces to deploy in a coalition, as part of NATO, or on independent missions[78] often means that these nations have a tendency to serve together on multiple missions simultaneously – and face the same threats together. Consequently, interoperability and developing equipment together to counter these threats is mutually beneficial. The factor, however, that can still create issues is politics. Forming an appropriate framework for the establishment of specific policies and practices is necessary. Properly structured, international collaborative projects can mitigate this factor by moving "as much program-structuring and decision making as possible down to the industry level."[79] Likewise, in the development of international collaborative projects there must be mutual interest among partner nations. Finally, competition by international groupings of defence firms will result in contract awards based on merit.

The U.S. Joint Strike Fighter aircraft project is a current example of a major international weapons system project that is benefitting a number of nations. The structure of the program, the large quantity of aircraft that will be produced, and the incentives provided to development program participants give an opportunity to examine a project that was explicitly established to encourage international participants in order to reduce unit costs. Indeed, the Joint Strike Fighter aircraft project can be viewed as a template for future international collaboration. Although the contentious issue of technology transfer has been prominent throughout the development phase of the project, issues such as international design capacity, information sharing and other global aerospace challenges have also been addressed as this cooperative project goes forward.

The Joint Strike Fighter Aircraft Project

The Joint Strike Fighter (JSF) aircraft project is one of the largest, current international capital programs in the international defence sector.

The aircraft resulted from a series of other aircraft development efforts in the initial stages of the 1990s primarily aimed at meeting all the air-to-ground requirements of the United States Navy, Marine Corps, and Air Force. Early in the project, officials and industry leaders recognized that this broad objective was also well suited to address the needs of a number of military forces in allied nations. Thus, an important goal of the program is

> to create a new model for international collaboration that provides specific entry and exit criteria for the programmes's non-U.S. participants. This model allows individual countries enough insight into the programme to decide whether the JSF is the right platform for their national security needs. They are also allowed to use JSF modeling and simulation technologies to validate their requirements.[80]

To facilitate international partnership in this project, countries are able to decide on the level of partnership that best suits their needs. For the Joint Strike Fighter, there are three formal participation levels. Level I partners are deemed to be collaborative partners. As such, nations in this category have considerable influence in aircraft requirements and design solutions. This also includes having a substantial number of personnel working in the integrated project office. Associated with this responsibility comes the requirement to fund a commensurate amount of the system development and demonstration costs.

Level II partners are considered to be associate partners. This lesser level of partnership provides limited access to the program and related technology. Staff in the integrated program office is minimal, and funding required for system development and demonstration costs is proportionally less than that of collaborative partners.

Level III partners are regarded as informed partners. This level provides the nations with only the level of information necessary for them to determine the applicability of the Joint Strike Fighter variants for their needs. At this level, funding of system development and demonstration costs is limited to one to two percent of program costs, and representation in the integrated program office is limited to one delegate. Canada is an informed partner in the program.

The final level is Security Cooperation Participation. This level requires limited funding contributions, yet provides the interested country with information on the project for use when considering future procurement from the United States under the Foreign Military Sales Program. It is important to note that Level I to Level III partners receive

proportional shares of levies on American foreign military sales in recognition of their investment in program research and development costs.

Early commitment to a major international weapons system project may limit future national options. Furthermore, the international strategic environment could possibly change, along with future anticipated requirements. One option is to delay procurement decisions for as long as possible. Indeed, "cost pressures can always be mitigated by buying some of the aircraft later than currently planned to take advantage of the expected reductions in cost in the first years of JSF production."[81]

The industrial benefits of participation in a major international joint weapons system contract – irrespective of the operational merits of the program – can be significant. Projects can vary between very centralized development, design and production and a more decentralized approach. Trade-offs can be made within this range, with additional costs accepted by nations in return for an enhanced share of work within the countries. Furthermore, some project work done during the acquisition phase can be leveraged to provide benefits in subsequent phases of the equipment life cycle. In a study for the United Kingdom Ministry of Defence on assembling and supporting the Joint Strike Fighter nationally, its authors concluded that final assembly and check-out tasks overlap with maintenance, repair and upgrade tasks.[82]

Canada's Department of National Defence is not currently in partnership with any other nations in the development of any aircraft except the Joint Strike Fighter. The only potential competition to the Joint Strike Fighter aircraft project is the Eurofighter aircraft program. From a conceptual perspective the Joint Strike Fighter aircraft project provides the best model to date for future international collaboration projects. On the positive side, it provides participating nations with leading-edge technology. On the negative side, participation at Level II and below does not give those nations substantive input in development of that aircraft or significant influence over requirements.

CHAPTER 6

Emerging Procurement Practices in Defence

> Every dollar spent inefficiently in acquiring weapons systems is less money available for other budget priorities.[83]
>
> Michael J. Sullivan

Emerging practices in defence procurement and asset management, and the potential changes that they may bring, make it an exciting time to be working in this field. Indeed, entrenched Cold War practices – which may have been adequate at that time – are gradually giving way out of necessity to methods that are more appropriate to the current international strategic environment. Governments realize that current acquisition processes need to adapt continually and more responsively to the security environment. As a consequence, organizations and individuals in all the government and private sectors involved in defence procurement generally become more open to new ways of doing business.

This section examines some of the more prominent emerging practices that have the potential to fundamentally change the way capital equipment is acquired and managed by governments. The section begins with a review of evolutionary acquisition, one of the most promising acquisition strategies to emerge in this decade. The second notable emerging practice that is considered is incremental development. The third prominent emerging practice is the use of the "spiral development process," together with the unique integration of a variety of organizations that this process requires in order to function effectively.

The fourth important emerging practice is independent program oversight. Continuing problems in the management of capital programs highlight the potential benefits that could accrue to the acquisition

process if management of those problems were improved. Independent program oversight is emerging as a significant enabler in enhancing program management.

The fifth practice gaining prominence due to the critical importance of timeliness in the current international strategic environment is shorter capital programs. The sixth emerging practice (closely related to the fifth concept) involves a range of capital asset management practices that facilitates the acquisition and operation of infrastructure and equipment. The most important emerging capital asset management practice is an integrated portfolio investment strategy drawn from the corporate sector. This strategy prioritizes needed capabilities and links them to available resources, while implementing controls over requirements, funding, and acquisition processes.

Also growing in practice are public-private partnerships, with government and the private sector entering a long-term arrangement for the maintenance or use of infrastructure and equipment. The final capital asset management practice, which has been adopted by a number of national governments, is the use of accrual accounting and budgeting for the acquisition of capital assets.[84]

Evolutionary Acquisition

One of the most promising acquisition strategies to emerge into prominence in this decade is evolutionary acquisition. The primary goal of this acquisition strategy is to "provide operationally useful capabilities to the warfighter much more quickly than traditional acquisition strategies. Instead of the old approach of 'single step to full capability,' evolutionary acquisition aims at achieving an overall objective end capability through the more rapid fielding of numerous operationally useful threshold capabilities by pursuing less demanding intermediary or increment steps."[85] The time required in traditional procurement methods can result in a weapons system being delivered with important technology embedded within the equipment that is a minimum of one generation old. Military leaders everywhere complain, moreover, that traditional procurement methods are not well suited to the tight timelines required in the current international strategic environment.

The traditional method that defence departments have used to acquire a new fleet of weapons systems is to begin with a set of specific performance requirements for the systems. Once those requirements have been established, the following decade and a half is taken up in

developing, building and integrating the weapons systems into operational units. The traditional acquisition process focuses on meeting 100 percent of the original performance specifications. Conversely, the evolutionary acquisition strategy only aims to achieve a portion of final capability, with the initial version provided to the user over a shorter period of time. Applying field experience and continued development, subsequent versions of the weapons systems provide increasing levels of performance capabilities. The primary benefit of an evolutionary acquisition strategy is that it quickly puts initial versions of the weapons systems into the hands of operational personnel on deployed operations.

The evolutionary acquisition strategy for procurement is very well suited to the current post-9/11 security environment, where timeliness is critical. This has been the preferred approach to acquisition of weapons systems in the U.S. Department of Defense since 2000.[86] Despite the consensus that the traditional procurement process takes too long, implementing evolutionary acquisition in practice has proven difficult. Yet, in the current security environment, fielding new-generation devices to counter threats as soon as these devices become available is essential to protecting the lives of military personnel deployed in hostile environments.

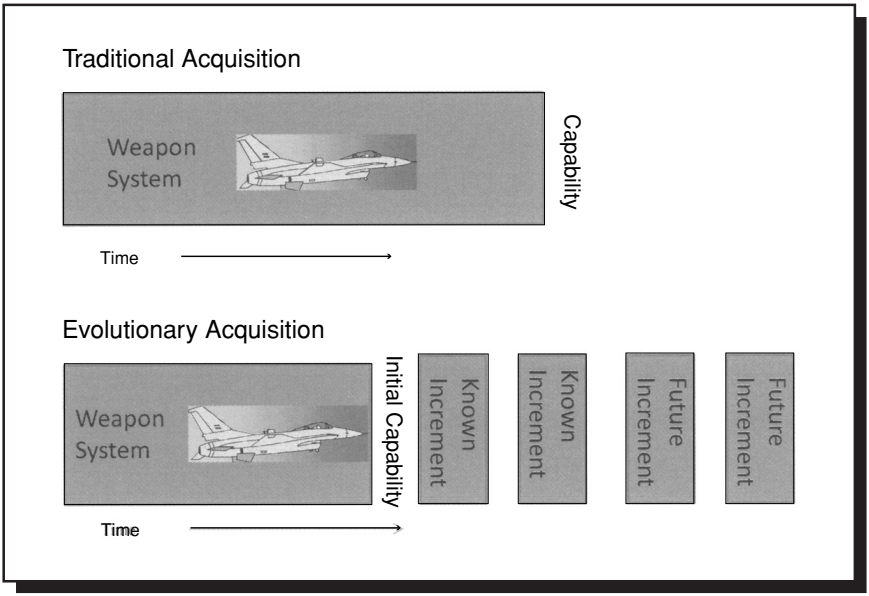
Evolutionary acquisition is defined by the Western European Armaments Group as

> a strategy to acquire a large and complex system, which is expected to change over its life cycle. The final system is obtained by upgrades of system capability through a series of operational increments. [It] aims to minimize many of the risks associated with the length and size of the development, as well as requirements volatility and evolution of technology.[87]

Evolutionary acquisition strategies, despite the benefits they can provide, may not be appropriate for procurement in all circumstances. Evolutionary acquisition is by its very nature an "acquisition within an acquisition."[88] The complexity of this approach to acquisition greatly exceeds that of traditional methods. From a strategic perspective, the project manager using an evolutionary acquisition approach is faced with managing the overall system configuration of the weapons system through multiple iterations. From an operational perspective, the project manager must manage and control modifications at each stage of development. Finally, at the tactical level, the project manager must successively integrate each development block into the system during a specific time period.

Chart 6.1 provides a graphic illustration of the differences between traditional and evolutionary methods of acquiring defence equipment. The traditional defence acquisition methodology consists of only a single step. Conversely, evolutionary acquisition consists of multiple steps. The acquisition process in the traditional methodology is complete once the weapons system has been delivered. In evolutionary acquisition, the initial delivery of the weapons system with a functional initial capability is simply the start of the in-service phase of the equipment, followed by a succession of integrated block upgrades of new technology once they are available.

Chart 6.1. Traditional and Evolutionary Acquisition Comparison



In the current evolving international strategic security environment, a static procurement process lacks the necessary capability to adapt to and leverage change. Evolutionary acquisition provides defence departments with the capability to incorporate technological advances into weapons systems very soon after they occur. Similarly, deficiencies in operational capabilities – once identified – can be corrected in subsequent iterations of the weapons system delivery. In asymmetric and with conventional conflict situations, threats can change significantly, thereby placing different demands on equipment than originally forecasted. Secondary

effects can include the growth in breadth of missions undertaken, and expansion in the number, or type, of users. Finally, incorporation of enhancements or modifications to manufacturing capabilities can bring cost savings and improved production processes in subsequent iterations of a weapons system.

A fundamental precept of applying an evolutionary acquisition strategy within defence departments is the necessary establishment of linkages between operational military personnel, evolving technologies, shifting requirements, and equipment sustainment, together with the consequential increase required in responsiveness of acquisition practices. Given the evolutionary nature of this strategy, decision points can be tailored to meet the particular demands of the program, throughout the various stages of acquisition from development to production. This flexibility of process is a key feature of evolutionary acquisition, yet in process-driven organizations like most Western defence departments this feature of evolutionary acquisition does not mesh with the longstanding conservative culture in defence acquisition policies.

Current budgetary practices established to support the traditional capital acquisition process have not kept pace with the resource demands inherent in evolutionary acquisition.[89] All cost projections for embryonic or planned weapons system acquisition programs, notwithstanding the procurement methodology, will be subject to change – indeed sometimes significant change – for a variety of reasons. However, employment of an evolutionary acquisition strategy may increase the volatility of funding projections, over employment of traditional procurement methods, due to the iterative development process inherent in evolutionary acquisition.

Nevertheless, supporters of the evolutionary acquisition strategy point out that cost estimates for traditional acquisition programs stretch well into future fiscal years, and historically the programs have also been subject to considerable cost growth. As a result, this information can give national governments "the illusion – but not the reality – of understanding the outlines of the entire program."[90] Cost estimates in the evolutionary acquisition strategy focus on the upcoming block increment of one to three years, which is more useful for parliamentary oversight than are long-term projections.

In the short term a significant constraint of the evolutionary acquisition strategy is the amount of time it can take to program changes in the resource demands of major capital projects as they progress through one or more development cycles. Without the prerequisite flexibility in

the annual budgetary cycle to respond to shifts in financial resource requirements, inadequate resources could lead to suboptimal results. Similarly, committing an excess of financial resources towards a project is an inefficient management practice.

The challenge to those Western defence departments considering implementing the concept of evolutionary acquisition – and a challenge which they have not successfully managed to overcome – is to develop ways to program funding allocations against theoretical requirement changes or estimated future obsolescence rates for equipment fleets, when real budgetary shortfalls exist in current operations. Supporters of evolutionary acquisition practices argue that whereas military personnel "may not initially receive an ultimate capability, the product is available sooner, with higher quality and reliability and at a lower and more predictable cost."[91] The United States Government Accountability Office supports the concept and has concluded that evolutionary acquisition within defence is aligned with best practices in commercial acquisition.[92]

Incremental Development

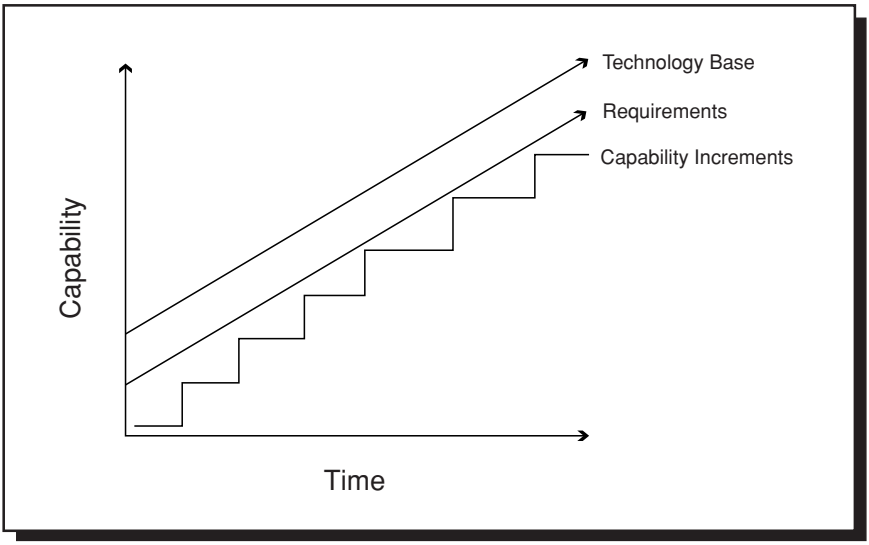
An incremental approach to acquisition is based on the use of available mature technology, with desired capabilities established at the start of the program. Based on the objective of meeting capability goals – over time – a series of increments are planned to achieve this capability. With each new increment, more functionality is added to the weapons system, with the process continuing through a series of increments over time until all required capabilities are attained.

The contribution of this acquisition process is that a working system is available to required users immediately after the first increment. From that point each succeeding increment provides the user with superior capability. Furthermore, in a resource-constrained environment where operational priorities can shift, future planned increments can be cancelled and military forces would still have a functional product.

Despite the benefit of timeliness that this approach to acquisition brings to military forces, there are a number of challenges that it brings to defence departments.[93] Most prominent is the need to define fully the desired requirement at the beginning of the process, a requirement that may not be either known or practicable at the onset. This difficulty can, however, be mitigated to some extent in subsequent changes to later increments. Although incremental development facilitates project

management, the division of the project into discrete steps spread out over time complicates support for the equipment once it has been deployed. Complications arise because different models of the weapons system may be in use at a given time and because additional training and, perhaps, parts supply may change greatly with the release of each new increment. See Chart 6.2.[94]

Chart 6.2. Incremental Development



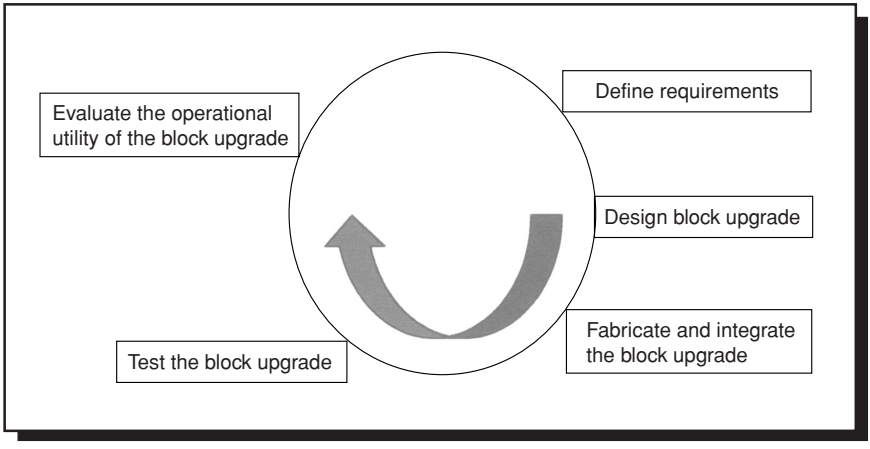
Spiral Development

Another approach to defence acquisition, the so-called spiral development approach, is characterized as a series of acquisition activities that are incorporated incrementally into a shifting baseline. Capability is increased over a short period of time with an individual spiral, which is built on the foundation established by preceding spirals. This course of action enables the distribution of both development costs and project risks over an extended period of time. Individual spirals are compartmentalized through the largely independently developed project, or projects, within that cycle. Once the spiral has produced specific improvements, it is incorporated into the baseline production model. Spiral development, out of necessity, brings together operators of the weapons systems, development staffs, evaluators and specialist personnel.

The spiral development process has been used in a number of weapons systems in the past. The F-16 aircraft is a prominent example of an enduring weapons system that was "developed in the early 1970s and has been upgraded with block modifications over the last three decades."[95] This approach is particularly suited for aircraft in which weapons systems are being developed at a much faster rate than are the airframes, which have experienced a "maturing of platform capabilities."[96] In essence, this process decreases risk by focusing on developing technologies already in use in existing weapons systems. Conversely, application of spiral development techniques can act to mitigate the significant risks in developing weapons systems that utilize nascent or emerging technologies.[97]

Chart 6.3 graphically illustrates the process inherent within an individual spiral. Each spiral begins with a definition of requirements, which includes the establishment of performance objectives. The second step within the spiral is the design of the increased capability within the weapons system. The third step begins with the creation of the applicable software code, followed by the integration of both operational and manufacturing incremental improvements. The fourth step focuses on testing the incremental capabilities, as well as experimenting to assess the enhanced capabilities objectively. The final step gauges the value of extending operational capabilities, making adjustments as required, and delivering the capability enhancements. Each successful increment may contain a number of spirals.

Chart 6.3. The Spiral Development Process



Fundamental to the spiral development process is the integrated nature of the relationships that are essential for creating a continuous series of improvements. Within each spiral, the user of the equipment, the development entity, and the organization that is involved in testing and evaluating the incremental capabilities all work directly in concert. The operational military personnel who use the equipment invariably have ideas for practical improvements and understand the strengths and weaknesses of the existing weapons system. In addition, those with recent deployed operations experience with the equipment will understand and are often capable of articulating the deficiencies of the equipment in the current security environment. Similarly, personnel who are experienced in testing and evaluating will be proficient in subjecting equipment with incremental capabilities to conditions that exhibit design flaws, deficiencies and shortcomings.

Finally, the developer will invariably have particular expertise in this field and will be adept at translating the suggestions of the operator into the development of improved capabilities. The intensity of this relationship creates an effective collaboration among all parties, linked by the procurement community in the central process of determining which requirements take priority and the timelines under which they will be integrated into the particular weapons system.

The primary difference between incremental and spiral development is that in incremental development end-state capabilities are known, whereas with spiral development end-state requirements are unknown. This distinction has a fundamental influence on each of the two development processes.

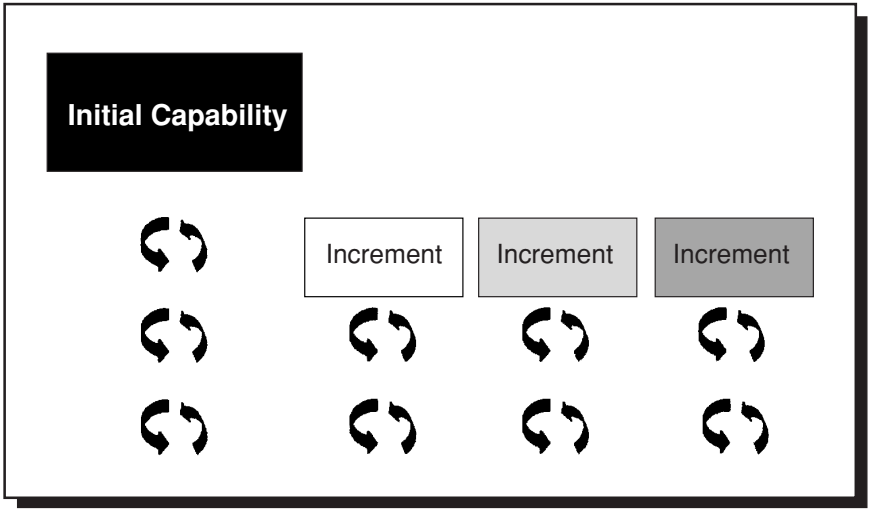
Under the incremental developmental process the final project is delivered through a series of distinct stages, whereas under the spiral developmental process the product design is a work in progress until completion of the final spiral. Spiral development, however, provides for enhanced risk management through the continuous feedback inherent in the spiral process. This is predicated on a superior understanding of user needs, achieved through ongoing feedback. Under this circular feedback loop, requirements are refined through both product testing and risk management. Consequently, these factors contribute to the provision of optimal capability within each increment. For this reason, "spiral development is often used in the commercial market because it significantly reduces technical risk while incorporating new technology."[98]

Nevertheless, cost and schedule risk can rise, and the process is inherently more difficult to control due to the need to manage the costs and delivery of requirements while managing several other variables. Similarly, the necessary superior understanding of user needs may not always materialize, thus the effectiveness of this process may be diminished. The continuous feedback loop partially compensates for this possibility.

Integrating Spiral Development and Evolutionary Acquisition

Chart 6.4 illustrates the amalgamation of evolutionary acquisition and spiral development. Although each is a distinct process, together the effect they provide greatly surpasses their individual impacts. This result occurs because, first and foremost, evolutionary acquisition is a strategy whereas spiral development is a process. Indeed, it is spiral development that supports the implementation of evolutionary acquisition. The integration of spiral development and evolutionary acquisition illustrates the value of combining various processes and techniques depending on particular circumstances.

Chart 6.4. Integrating Spiral Development with Evolutionary Acquisition



Independent Program Oversight

The ability of program management to deliver the program on time, within budget and with the required capability is a central element of all major military capital programs. Indeed, a deficiency in independent program oversight has been identified in defence acquisition research as a leading shortcoming in the management of capital projects.[99] Program oversight has received considerable attention in Australia with the introduction of an independent Project Performance Office.[100] In the United States, the Government Accountability Office recently advocated improved management oversight for defence capital projects.[101]

The function of independent program oversight is to allow skilled subject-matter experts and experienced project-management professionals to provide disinterested advice to the project management team. The independent agent may also "keep government decision makers informed of the true status of their programs, including budget status, requirement changes, technology risks, and progress toward cost, schedule, and performance goals."[102]

In the current environment with technology changing rapidly in high priority equipment used in deployed environments such as Afghanistan, the inclusion of independent program oversight with external topical experts enhances both advice and subsequent program review at key decision points. The fundamental objective of independent program oversight is to foster more informed decisions.[103] Indeed, with the expenditure on independent oversight normally being marginal to overall project costs, the advantages that it can bring to the project come at little additional cost.

Shorter Programs

> Constraining cycle times to 5 or 6 years would force programs to conduct more detailed systems engineering analyses, lend itself to fully funding programs to completion, and thereby increase the likelihood that their requirements can be met within established time frames and available resources.[104]

Establishing concise time limits on capital projects is one of the hallmarks of successful project delivery in the private sector. A recent study concluded that shorter development periods correlated positively with reductions in program instability and with improved project

outcomes.[105] Moreover, discipline in the initial stages of the weapons system procurement process through establishing the requirement for certain knowledge thresholds improves the potential for enhanced outcomes. Corporate best-practices plans require development cycles of two to five years and multiple-gated reviews prior to product commitment.[106] To be sure, with timeliness a fundamental prerequisite of capital programs in the contemporary international strategic environment, the desire of Western defence departments to shorten the acquisition process – which in the past has often exceeded a decade – is virtually universal.

A primary characteristic that defines current insurgencies in failed and failing states is the use of improvised explosive devices (IEDs) by insurgents against coalition forces deployed to assist the local population. Consequently, the various measures taken by defence departments to counter this emerging and prominent threat constitute the most high profile example of rapid acquisition and deployment of military equipment to meet changing operational requirements.

Leading this response is the development of new generations of mine-resistant vehicles.[107] The United States' "Mine Resistant Ambush Protected (MRAP)" vehicle program has, for example, been the most important weapons system acquisition program in the last half of this decade in support of American forces in Afghanistan and Iraq. The program, for which US$22 billion in funding had been appropriated by mid-2008,[108] is a large-scale, contemporary illustration of a deliberate process to condense product development, assembly, and delivery to deployed units.

The American MRAP vehicle program has a number of characteristics that deserve consideration. Foremost was the predominant reliance in the development phase of the program on commercially available products. While production, testing and fielding of the vehicles was done concurrently, indefinite quantity contracts[109] were awarded to nine different commercial sources, for up to 4,100 vehicles annually from each vendor, with test models purchased from each source. Project management also took the decision to integrate mission equipment packages, such as radios, into the vehicles after procurement.

Although "the department's concurrent approach to producing, testing, and fielding the vehicles has provided an urgently needed operational capability, it has also increased performance, sustainability, and cost risks."[110] Specifically, with a succession of progressively improved vehicle models purchased from five of the nine different manufacturers in service, the Department of Defense faces three distinct

challenges. First, the individual vehicle designs are specific to each manufacturer, requiring different vehicle operating and maintenance procedures. Second, the operation of several different models from the same manufacturer within the overall fleet adds to the maintenance complexity. Finally, logistics support requirements are multiplied by the proprietary nature of the vehicles and the added necessity to maintain stocks of spare parts for each MRAP vehicle variant.

The American MRAP vehicle program has delivered the benefit of vehicles designed to counter the current threat in a relatively short period of time while making a number of inventive changes to traditional acquisition processes. There is a medium-term cost, however, in complexity and difficulty of sustainment of the vehicles. For instance, in the current environment the cost-benefit relationship has shifted, placing the predominant weight on timeliness. Furthermore, even as these first improved vehicles were entering service, the threats faced by coalition forces in deployed operations in locations such Afghanistan continued to evolve as insurgents change their tactics in response to procedures and equipment employed by national contingents within that coalition. Therefore, under current circumstances, operational requirements for equipment such as MRAP vehicles also will continue to evolve, thus, further exacerbating the complexity of this fleet.

This fact is an important consideration and needs to be acknowledged as a defining criterion of defence capital programs in support of deployed operations in hostile environments. Whereas traditional procurement programs delivered a final product with mid-life upgrades in one or two decades, equipment deployed to locations such as Afghanistan will need to be continually upgraded in order to remain capable of countering evolving threats.

The complexities and challenges inherent in developing and maintaining MRAP vehicles are to be expected in a field where technologies are relatively immature and developing in response to a still-evolving threat. Although the vehicles are still being procured, as the technology matures over the medium term, processes and procedures will be developed and implemented to reduce risks and costs while simplifying sustainability. As approaches such as evolutionary acquisition and spiral development become more commonplace in defence departments, the long-term task of consolidating and managing multiple variants in a specific fleet will become the principal conceptual challenge to defence acquisition in this evolving strategic environment.

Capital Asset Management: Integrated Portfolio Management Investment Strategy

> Successful commercial companies use an integrated portfolio management approach to prioritize market needs and allocate resources; thus, they avoid pursuing more products than their resources can support and optimize the return on their investment.[111]

A management system in defence must, by its very nature, incorporate and manage a wide spectrum of different activities in a coherent manner. Personnel of various trades and classifications must be recruited and trained. Numerous fleets of army, navy and air force multi-million-dollar weapons systems must be procured, maintained and operated. Current operations must be supported while plans for future forces and equipment are developed and implemented. Yet, despite the prescriptive and analytical structure of defence management systems, the inability of defence departments to prioritize the demands for capital program funding is one of the most significant and enduring problems in defence.

In a resource-constrained environment defence policy is faced with the classic economic dilemma where the demand for capital funding exceeds the supply. Army, navy, air force, and joint projects all compete for the same limited pool of resources. In this situation difficult choices need to be made. When demand exceeds supply, lower priority projects need to be dropped from the long-term capital program. Nevertheless, various actors in this process have incentives to engage in suboptimal behaviour in order to keep their own environmental projects in the capital program in some shape or form. This habit might include the artillery community within the army, the anti-submarine community in the air force, or the submarine community in the navy. Despite the acknowledged benefits of joint operations, the barriers within defence establishments between individual services remain significant and greatly inhibit integrated decision making.

The perspective of the United States Government Accountability Office is that "although the military services fight together on the battlefield as a joint force, they do not identify war fighting needs and make weapons system investment decisions together in an integrated manner."[112] To be more specific, "at the strategic level, DOD does not prioritize weapons system investments, and the department's processes for matching war fighter needs with resources are fragmented and broken."[113] Matching needs with resources may appear to be a simple and

straightforward process, yet with the myriad of different competing interests in defence establishments, matching is very difficult to achieve. Although the advantage of integration is clearly evident, establishing a mechanism to achieve it has proven elusive not only in the United States but even in much smaller, less complicated defence establishments.

The private sector has many similarities to the defence sector. As with defence, major corporations are multi-billion dollar organizations and manage multiple large-scale capital programs. Although the interests of the private sector are geared towards generating a return on investment for shareholders, and thus it has a simpler set of parameters than that of defence establishments, the private sector does a much better job at managing its capital programs. Within the private sector, an integrated approach to managing the capital equipment portfolio is the foundation of a successful capital program and is an approach employed by leading corporations. Indeed, for military organizations that lack an "integrated investment strategy, all other improvements will fail as shown in the past."[114] To achieve an integrated investment strategy, capabilities need to be prioritized and linked to resources in a manner that will fuse with identified requirements and the departmental acquisition process. Finally, to be effective, integrated portfolio management is facilitated by "strong governance, with committed leadership, clearly aligned organizational roles and responsibilities, empowered portfolio managers who determine the best way to invest resources, and accountability at all levels of the organization."[115]

Although an integrated investment portfolio strategy is a fundamental feature of leading corporations, weapons system development has a number of characteristics not found in the private sector. Whereas benchmarks in international businesses can include increases in market share, growth in profitability, or return on investment, weapons system development is generally not viewed in these economic terms. In defence, military strategy, the institutional resource-allocation process, national political process, and the "synergistic nature of weapons systems"[116] are primary considerations. Furthermore, in defence these factors are necessarily interrelated, and changes in one can have a significant consequence for the others.

Notwithstanding differences in both the private sector and defence departments, each party must assess the costs and benefits of each individual program in order to develop and maintain an integrated investment portfolio management strategy. There are a number of significant probable benefits that can accrue to defence departments

through the adoption of leading portfolio management practices from the private sector. An integrated portfolio management strategy is one method for assigning and managing capital funding resources and priorities in line with corporate priorities. Similarly, smaller numbers of overall programs will allow management to concentrate efforts on the priority programs.

Capital Asset Management: Public-Private Partnerships

Management reforms in the 1980s strove to "re-invent" government by structuring work between government and the private sector so that it aligned best with the core competencies of each entity. Public-private partnerships facilitate this relationship by helping to foster "the well-defined yet flexible environment a government needs to retain responsibility for and control over its mission while an outside source handles implementation."[117] A public-private partnership can be defined as "a partnership arrangement in the form of a long-term performance-based contract between the public sector (any level of government) and the private sector (usually a team of private sector companies working together) to deliver public infrastructure for citizens."[118] Although public-private partnerships are typically used for infrastructure, in the case of defence departments this could also include capital equipment.

Public-private partnerships can take several different forms. At the most basic level, infrastructure is delivered to government through a contract in which government establishes the requirements and the private sector designs and builds the facility. Public-private partnerships can also include the government providing the infrastructure and the private sector managing the facility through a service contract. Furthermore, under a contractual arrangement, the private sector can provide both the infrastructure and the facility management; this arrangement can also include operating the facility on behalf of the government. The growing infrastructure deficit in countries around the world, the limited ability of governments to finance all necessary projects up front, as well as the social and economic costs that this infrastructure deficit causes are increasing the popularity of public-private partnerships. For example, in 2007, private participation in public infrastructure increased by double digits in most countries.[119]

Public-private partnerships have a number of positive attributes. First, infrastructure can be delivered much faster through public-private partnerships than through conventional methods, and delivery of projects

tends to be on time and within budget. Linked maintenance contracts can alleviate the fluctuations in public budgeted maintenance funding that can occur with government facilities. Furthermore, making the contractor that built the facility responsible for long-term maintenance costs provides an incentive to the builder to erect a facility to a high standard in order to reduce future life-cycle costs. Finally, public-private partnerships allow government departments to focus on their core businesses and on program outcomes, rather than expending considerable effort on managing output processes.[120]

Although public-private partnerships have a number of positive attributes, their application in defence management can pose a number of challenges to defence departments. The foremost concern is uncertainty over future requirements. The long-term nature of public-private partnerships in an environment where the character of the threat can change suggests that requirements are subject to change, sometimes suddenly. Consequently, under these circumstances, establishing appropriate enduring long-term commitments is difficult. Indeed, much of the risk inherent in long-term contracts is derived from the extraordinary rate of sustained technological change. In addition, project complexity and the integration of multiple systems into one platform are further challenges that public-private partnerships need to overcome. The high value of acquisition costs for public-private partnership projects in defence and the subsequent time frame necessary to amortize those costs also pose a substantial challenge to consortiums. From the perspective of defence, an uncertain future could mean uncertain quantities of the weapons systems that are considered essential. A decreasing threat could, over time, reduce the number of weapons systems required, although the government would remain liable for payment of all systems for the duration of the contract.

The large number of high-value weapons systems employed by Western military forces, and the extraordinary annual level of capital budgets necessary to replace some elements of this fleet, is an increasingly difficult challenge for national governments. Critics of inadequate capital funding in defence in the United States have pointed to an upcoming collective "bow wave" of major capital projects requiring funding, or a looming "train wreck" due to the unavailability of sufficient funds to replace aging weapons systems.[121] This worry was echoed by the United States Congressional Research Service in their assessment that "cost growth in major weapons programs has become so endemic and so severe that it may be producing, if not a train wreck,

then, perhaps, a ship wreck."[122] With projections of required capital expenditures remaining high,[123] the considerable capital outlay required during the procurement phase is a fundamental limiting factor for governments and makes procurement and management of some defence capital assets candidates for public-private partnerships.

In response to the difficulties that public-private partnerships can generate for governments, a number of original hybrid models have been developed that account for the diversity of requirements across government departments. In the case of defence, the alliance and incremental public-private partnership models can be appropriate in certain circumstances.[124] Similarly, competitive partnerships can be applicable in some situations. The alliance public-private partnership model entails both sectors combining to develop and finance specific projects; this can also provide for the two parties jointly constructing, maintaining and operating a facility. The incremental partnership model allows the government to contract for work incrementally, as well as employ diverse partners for different tasks; central to this hybrid is that the government retains the right to terminate or reduce designated contracted work. The competitive partnership model provides for the contracted work to be divided amongst several different corporations; the performance of each firm dictates whether work is subsequently reallocated for future periods. The alliance and incremental partnership models are suitable for the defence sector because they can be employed in circumstances where future demand is uncertain. The competitive partnership model has the potential to be employed in certain cases where the government desires to maintain several competitors in a specific market.

Capital Asset Management: Accrual Accounting

The perennial problem in defence has historically been the considerable initial financial investment needed to acquire new multi-million-dollar equipment fleets. Although the expected in-service life of the weapons system could have been several decades, all capital investment costs were incurred at its introduction into service. Thus, the cost to the government for that equipment was not matched with the period during which the government derived benefits from its use. The cost of major capital programs completely funded at acquisition can result in those programs dominating a defence department's capital program for several years, at the expense of other essential projects.[125]

Consequently, the manner in which projects are funded can have a considerable impact on the possible number and timing of projects.

The effectiveness of military forces has a significant correlation with the defence capital program. Indeed, the capital program is closely linked with defence policy, with government policy informing what equipment capabilities are needed by the Canadian Forces. In a report on capital equipment procurement in 1998, the Auditor General observed that "defence capital acquisition decisions affect how well the Canadian Forces can implement defence policy. The amount and type of equipment they purchase directly affects their ability to carry out their roles, which in turn determines how and where the government can deploy them."[126]

Defence planning, by its very nature, requires a long-term focus, which can extend up to three decades. This intergenerational approach is essential to enable the planning, funding and sequencing of the significant number of high-value land, sea, air and joint capital projects. Under these circumstances, traditional cash-based accounting does not adequately provide the level of information required today for decision making and resource planning. Under the accrual basis of accounting, the capital equipment is recorded on the balance sheet at historical cost, which is amortized over the estimated useful life of the asset. As a result, the cost of the equipment is spread out over the expected life of the asset, rather than being recorded simply at the time of acquisition. This is important as it reduces the impact that procurement of one particular equipment fleet has on the defence capital base in the short term.

A number of national governments over the past decade and a half have moved to replace their traditional cash-based accounting method with an accrual-based accounting method.[127] Defence departments, normally the largest holders of capital assets within government, are the most affected. This shift in accounting methodology was made not in isolation but as part of a broad-based series of reforms in the public service.[128] From the perspective of ownership of an extensive asset base, defence departments also had the most to gain. With defence departments needing to plan over an extensive period of time, they benefit from accrual accounting as follows:

> [It] generates the ability for decision makers to take a longer-term focus. The information presented for the ownership interest, and in particular the balance sheet, raises issues such as the need to hold surplus assets, to invest, restructure or divest. Such decisions have a long-term impact and

> may in fact take more than one year to implement. Accrual accounting strengthens the information base for reaching those decisions.[129]

In defence the benefits that can be derived from the use of the accrual method of accounting include superior transparency of overall resource costs, improved resource allocation and enhanced accountability. Whereas the nature of budgetary decision making has not changed, the level and detail of information available to decision makers is enhanced.

CHAPTER 7

Summary of Emerging Practices in Defence Acquisition

> The provision of a combat capable military force is a continuous process. The irregular nature of major crown procurement has a negative effect on the industrial base. These boom and bust cycles inevitably lead to a loss of manpower, technical expertise and wasted government investment when projects complete. This negative result can be partially offset by the involvement of industry in the lifetime maintenance, technical upgrades and management of the platforms.[130]
>
> Standing Committee on National Defence and Veteran Affairs (2000)

Across a number of allied countries several practices are emerging that have the potential to align the defence acquisition process better with required delivery timelines. Indeed, if the provision of combat capability is a continuous process, why is the defence acquisition process not also a continuous process? Combat tactics, techniques and procedures, out of necessity, evolve persistently to counter shifts in the tactics of opponents. The failure to adapt to opposing military forces, or to insurgents, can result in increased injury or death. In Afghanistan, the Canadian Forces have expended considerable effort to adapt and even to shape engagements with the insurgents.[131] Unfortunately, the same effort has not been expended to adapt existing acquisition practices to meet the evolving operational requirements of fleets that are engaged heavily in deployed operations, although a number of initiatives have been taken in this area.[132] Whereas this may not be necessary for all equipment fleets, for those in ongoing intense use on deployed operations in failed and failing states it may be essential.

Timeliness is a key criterion in capital programs in the current international strategic environment. The emerging practices discussed in this section are increasing in importance expressly because they assist in reducing the time required from conception to delivery of the product. Although the concentration is often on operations, transformation of military forces affects all aspects of defence establishments. However, despite the extensive efforts that governments have expended on defence procurement reform, progress has been limited and has generally fallen short of expectations. To a certain extent, this is to be expected in an environment dominated by incessant change. Thus, adjustments in procurement processes designed for specific circumstances may be outdated by the time they are in place. The key, therefore, is to develop procurement processes that are designed to evolve as circumstances are transformed. The emerging practices in defence acquisition discussed in this section are examples of the ways in which defence acquisition is evolving, and bring greater flexibility and adaptability into this important component of defence management.

Emerging practices in defence acquisition cannot be viewed in isolation. The impact of one particular emerging practice can be, at most, moderate. When they are used collectively, these practices have the potential for the greatest impact. Circumstances are different in each of the air, land and sea environments; therefore, the responses must necessarily be distinct. Consequently, it can be expected that there will be further emerging practices integrated into defence acquisition over the coming decade in response to changing circumstances. Thus, continued defence acquisition reform will be required in order to meet the demands of future deployed operations.

Notes

[1] Stephen V. Reeves (1996), *The Ghosts of Acquisition Reform: Past, Present and Future* (Washington, DC: Industrial College of the Armed Forces), p. 25.

[2] Mark V. Arena, Robert S. Leonard, Sheila E. Murray, and Obaid Younossi (2006), *Historical Cost Growth of Completed Weapon System Programs* (Santa Monica, CA: RAND), page xii.

[3] Stuart J. Evans, Howard J. Margulis, and Harry B. Yoshpe (1968), *National Security Managemen: Procurement* (Washington, DC: Industrial College of the Armed Forces), p. 1.

[4] Christopher H. Hanks, Elliot I. Axelband, Shuna Lindsay, Mohammed Rehan Malik, and Brett D. Steele (2005), *Reexamining Military Acquisition Reform: Are We There Yet?* (Santa Monica, CA: RAND), pp. 5–34, <http://www.rand.org/pubs/monographs/2005/RAND_MG291.pdf> accessed 7 October 2008.

[5] President's Blue Ribbon Commission on Defense Management (1986), *National Security Planning and Budgeting* (Washington, DC: President's Blue Ribbon Commission on Defense Management), p. 1, <http://www.ndu.edu/library/pbrc/36se2c1.pdf> accessed 9 October 2008.

[6] President's Blue Ribbon Commission on Defense Management (1986), *The Legal Structure of Defense Organization* (Washington, DC: President's Blue Ribbon Commission on Defense Management), <http://www.ndu.edu/library/pbrc/36L52.pdf> accessed 9 October 2008.

[7] President's Blue Ribbon Commission on Defense Management (1986), *Conduct and Accountability* (Washington, DC: President's Blue Ribbon Commission on Defense Management), <http://www.ndu.edu/library/pbrc/36c75c1.pdf> accessed 9 October 2008.

[8] President's Blue Ribbon Commission on Defense Management (1986), *A Formula for Action: A Report to the President on Defense Acquisition* (Washington, DC: President's Blue Ribbon Commission on Defense Management), <http://www.ndu.edu/library/pbrc/36ac7c2.pdf> accessed 9 October 2008.

[9] President's Blue Ribbon Commission on Defense Management (1986), *A Quest for Excellence: Final Report to the President* (Washington, DC: President's Blue Ribbon Commission on Defense Management), p. 44, <http://www.ndu.edu/library/pbrc/36ex2.pdf> accessed 5 October 2008.

[10] Reeves (1996), *The Ghosts of Acquisition Reform*, p. 23, <http://www.ndu.edu/library/ic6/96-e-04.pdf> accessed 9 October 2008.

[11] United States Department of Defense (1993), *National Performance Review* (Washington, DC: Department of Defense), <http://govinfo.library.unt.edu/npr/library/nprrpt/annrpt/agnrpt93/dod1.html> accessed 9 October 2008.

[12] United States (1994), *The Federal Acquisition Streamlining Act of 1994* (Washington, DC: United States Congress), <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=103_cong_bills&docid=f:s1587enr.txt.pdf> accessed 9 October 2008.

[13] William S. Cohen (1997), *Defense Reform Initiative Report* (Washington, DC: Department of Defense), chapter 1 (conclusion), <http://www.fas.org/man/docs/dri/cover.htm> accessed 3 December 2008.

[14] Donald Rumsfeld (2001), *DOD Acquisition and Logistics Excellence Week Kickoff: Bureaucracy to Battlefield* (Washington, DC: Department of Defense), <http://www.defenselink.mil/speeches/speech.aspx?speechid=430> accessed 5 December 2008.

[15] Ibid.

[16] Assessment Panel of the Defense Acquisition Performance Assessment Project (2006), *Defense Acquisition Performance Assessment* (Washington, DC: Assessment Panel of the Defense Acquisition Performance Assessment Project), p. 1.

[17] Ibid, p.19.

[18] Ibid., p. 7.

[19] Ibid., p. 48.

[20] David Scruggs, Clark Murdock, and David Berteau (2006), *Department of Defense Acquisition and Planning, Programming, Budgeting, and Execution System Reform* (Washington, DC: Center for Strategic and International Studies).

[21] Ibid., pp. 20–22.

[22] United States Secretary of Defense (2007), *Defense Acquisition Transformation Report to Congress: John Warner National Defense Authorization*

Act; Fiscal Year 2007; Section 804 (Washington, DC: Department of National Defense).

[23] Ibid., p. 6.

[24] Assessment Panel of the Defense Acquisition Performance Assessment Project (2006), *Defense Acquisition Performance Assessment Report*, p. 8.

[25] Edward W. Rogers and Robert P. Birmingham (2004), "A Ten-Year Review of the Vision for Transforming the Defense Acquisition System," *Defense Acquisition Review Journal*, January–April, p. 49.

[26] Valerie Bailey Grasso (2002), *Defense Acquisition Reform: Status and Current Issues* (Ottawa: Congressional Research Service), p. 1.

[27] Hanks et al. (2005), *Reexamining Military Acquisition Reform,* page xiv.

[28] Ibid., page xv.

[29] Rogers and Birmingham (2004), "A Ten-Year Review of the Vision for Transforming the Defense Acquisition System," p. 54.

[30] Gordon Macdonald (1999), "Reform of U.K. Defense Procurement and State/Industry Relationships during the 1980s and 1990s," *Defence Analysis* 15, no. 1:2–26.

[31] United Kingdom National Audit Office (1997), *Ministry of Defence: Major Projects Report, 1997* (London: National Project Office).

[32] United Kingdom Ministry of Defence (1998), *The Strategic Defence Review* (London: Ministry of Defence), paragraph 161.

[33] Ibid., paragraph 152.

[34] United Kingdom Ministry of Defence (1998), *The Strategic Defence Review: Supporting Essay Ten; Procurement and Industry* (London: Ministry of Defence), paragraph 8.

[35] Ibid., paragraph 21.

[36] Ibid., paragraph 11.

[37] United Kingdom Ministry of Defence (2001), *Defence Acquisition: MOD Policy Paper No. 4* (London: Ministry of Defence).

[38] Claire Taylor (2003), *U.K. Defence Procurement Policy: Research Paper 03/78* (London: House of Commons Library), p. 20, <http://www.parliament.uk/commons/lib/research/rp2003/rp03-078.pdf> accessed 30 October 2008.

[39] Trevor Taylor and Derrick Neal (2004), "The Delineation of Defense Equipment Projects in the U.K. Ministry of Defence," *Defense & Security Analysis* 20, no. 2:165–177.

[40] United Kingdom Comptroller and Auditor General (2002), *Ministry of Defence: Implementation of Integrated Project Teams* (London: National Audit Office), p. 1.

[41] Taylor and Neal (2004), "The Delineation of Defense Equipment Projects in the U.K. Ministry of Defence," p. 167.

[42] United Kingdom Ministry of Defence (2004), *Departmental Investment Strategy* (London: Ministry of Defence).

[43] Ibid., p. 36.

[44] United Kingdom National Audit Office (2004), *Ministry of Defence: The Rapid Procurement of Capability to Support Operations* (London: National Audit Office).

[45] Ibid., p. 1.

[46] Ibid., p. 8.

[47] United Kingdom Ministry of Defence (2005), *Defence Industrial Strategy* (London: Ministry of Defence).

[48] Ibid., p. 10.

[49] Peter Felstead (2008), "U.K. Industry Is 'In Limbo,' Business Leaders Tell MPs," *Jane's Defence Weekly* (Coulsdon, U.K.), 26 November 2008, p. 5.

[50] Enabling Acquisition Change Team Leader (2006), *Enabling Acquisition Change: An Examination of the Ministry of Defence's Ability to Undertake Through Life Capability Management* (London: Ministry of Defence).

[51] Ibid., p. 4.

[52] Paul Nixon and David Moore (2007), "The Revolution in Defence Acquisition Affairs: Why Smart Acquisition Is Working," *RUSI Defence Systems,* Spring 2007, p. 67.

[53] Joel J. Sokolsky and Danford W. Middlemiss (1989), *Canadian Defence: Decisions and Determinants* (Toronto: Harcourt Brace Jovanovich).

[54] Australian Department of Defence (1997), *Defence Reform Program* (Canberra: Department of Defence).

[55] Mark Thompson (2007), *Improving Defence Management* (Canberra: Australian Strategic Policy Institute), p. 2.

[56] Australian Department of Defence (1998), *Defence and Industry Strategic Policy Statement* (Canberra: Department of Defence).

[57] Australian Department of Defence (2000), *Defence 2000: Our Future Defence Force* (Canberra: Department of Defence), p. 99.

[58] Ibid.

[59] Australian Department of Defence (2003), *Report of the Defence Procurement Review* (Canberra: Department of Defence), p. 47.

[60] Ibid., p. 32.

[61] Ibid., p. 19.

[62] Australian Foreign Affairs, Defence and Trade References Committee (2003), *Report on the Inquiry into Materiel Acquisition and Management in Defence* (Canberra: Foreign Affairs, Defence and Trade References Committee), page v.

[63] Ibid., p. 59.

[64] Ibid., p. 92.

[65] Australian Department of Defence (2008), *Going to the Next Level: The Report of the Defence Procurement and Sustainment Review* (Canberra: Department of Defence), page vii.

[66] Ibid., page ix.

[67] Ibid., page xi.

[68] United States Government Accountability Office (2009), *Defense Logistics: Lack of Key Information May Impede DOD's Ability to Improve Supply Chain Management* (Washington, DC: Government Accountability Office), p. 5.

[69] NATO (2006), *Backgrounder: Interoperability for Joint Operations* (Brussels: NATO), p. 1, <http://www.nato.int/docu/interoperability/interoperability.pdf> accessed 15 October 2008.

[70] According to NATO, "standardization makes a vital contribution to the combined operational effectiveness of the military forces of the Alliance and promotes opportunities for the better use of economic resources. Extensive efforts are made to improve cooperation and to eliminate duplication in the research, development, production, procurement and logistic support of defence systems, primarily through the promulgation of NATO Standardization Agreements, known as STANAGs. Implementation of STANAGs helps nations to achieve the required levels of interoperability and to better accomplish their common strategic, operational and tactical tasks, to understand and execute command procedures, and to employ techniques, material and equipment more efficiently." This is managed by the NATO Standardization Organisation. NATO (2006), *Backgrounder*, p. 2, <http://www.nato.int/docu/interoperability/interoperability.pdf> accessed 15 October 2008.

[71] NAMSA (2008), *About NAMSA* (Capellen, Luxembourg: NAMSA), <http://www.namsa.nato.int/about/about_e.htm> accessed 28 December 2008.

[72] Ron Matthews, "Costing a Bomb," *Financial Management*, May 2003, p. 19.

[73] The close cooperation between these countries stretches back to the Second World War. The current American-British-Canadian-Australian (ABCA) Armies' Program has been in existence for several decades, with interoperability as its present focus. <http://www.abca-armies.org> accessed 25 January 2009.

[74] D.W. Read (2000), "The Revolution in Military Affairs: NATOs Need for a Niche Capability Strategy," *Canadian Military Journal*, Autumn 2000, p. 23.

[75] Heiko Borchert and Rene Eggenberger (2003), "European Security Defence Policy, Role Specialization and Pooling of Resources: The EU's Need for Action and What it Means for Switzerland," *Contemporary Security Policy* 24, no. 3:7–10.

[76] Edward Lundquist (2009), "Good Business Is Good Policy: Foreign Military Sales Add to the Bottom Line and Reinforce Strategic Goals," *Armed Forces Journal*, January 2009, <http://armedforcesjournal.com/2009/01/3810243> accessed 10 January 2009.

[77] Vijay Kumar (2001), "Defence Collaboration: Policy Implications for Singapore," *Journal of the Singapore Armed Forces* 27 (October–December 2001):4, <http://www.mindef.gov.sg/safti/pointer/back/journals/2001/Vol27_4/5.htm> accessed 13 January 2009.

[78] An example of an independent or custom-designed mission is the longstanding "Multinational Force and Observers (MFO)" in the Sinai Desert. For different mission types, see Ross Fetterly (2006), "A Review of Peacekeeping Financing Methods," *Defence and Peace Economics* 17, no. 5:395–411.

[79] John Birkler, Mark Lorell, and Michael Rich (1997), *Formulating Strategies for International Collaboration in Developing and Producing Defense Systems* (Santa Monica, CA: RAND), p. 4, <http://www.rand.org/pubs/issue_papers/IP161/index2.html> accessed 13 January 2009.

[80] Cynthia R. Cook, Mark V. Arena, John C. Graser, Hans Pung, Jerry Sollinger, and Oblaid Younossi (2003), *Assembling and Supporting the Joint Strike Fighter in the U.K.: Issues and Costs* (Santa Monica, CA: RAND), p. 5, <http://rand.org/pubs/monograph_reports/2005/MR1771.pdf> accessed 5 October 2008.

[81] Andrew Davies (2008), "How Much Will the Joint Strike Fighter Cost Australia?" *Policy Analysis ASPI – 27* (Australian Strategic Policy Institute, Canberra), p. 1.

[82] Cook et al., *Assembling and Supporting the Joint Strike Fighter in the UK*, accessed 6 January 2009.

[83] Michael J. Sullivan (2008), *Defense Acquisitions: Results of Annual Assessment of DOD Weapon Programs* (Washington, DC: United States Government Accountability Office), p. 1.

[84] Ross Fetterly and Richard Groves (2008), *Accrual Accounting and Budgeting in Defence* (Kingston, ON: Queen's University School of Policy Studies).

[85] Mark A. Lorell, Julia F. Lowell, and Obaid Younossi (2006), *Evolutionary Acquisition: Implementation Challenges for Defense Space Programs* (Santa Monica, CA: RAND), page xv.

[86] Richard K. Sylvester and Joseph A. Ferrara (2003), "Conflict and Ambiguity: Implementing Evolutionary Acquisition," *Acquisition Review Quarterly*, Winter 2003, pp. 1–27, <http://www.dau.mil/pubs/arq/2003arq/Sylvesterwt3.pdf> accessed 6 October 2008.

[87] Jogn T. Dillard (2005), "Toward Centralized Control of Defense Acquisition Programs," *Defense Acquisition Review Journal*, December 2004–March 2005, p. 333, <http://www.dau.mil/pubs/arq/2005arq/2005arq-40/Dillard.pdf> accessed 7 October 2008.

[88] United States Department of Defense (2001), *Systems Engineering Fundamentals* (Fort Belvoir, VA: Defense Acquisition University Press), p. 26, <http://books.google.cahttp://books.google.ca> accessed 6 October 2008.

[89] Alexander R. Slate (2002), "Evolutionary Acquisition: Breaking the Mold; New Possibilities from a Changed Perspective," *Program Management*, May–June, pp. 6–15.

[90] Gary J. Pagliano and Ronald O'Rourke (2004), *Evolutionary Acquisition and Spiral Development in DOD Programs: Policy Issues for Congress* (Washington, DC: Congressional Research Service), pp. 5–6.

[91] United States Government Accountability Office (2007), *Cost Assessment Guide: Best Practices for Estimating and Managing Program Costs (Exposure Draft)* (Washington, DC: Government Accountability Office), p. 39.

[92] United States Government Accountability Office (2003), *Best Practices: Better Acquisition Outcomes Are Possible If DOD Can Apply Lessons from F/A-22 Program* (Washington, DC: Government Accountability Office), pp. 2–3.

[93] United States Government Accountability Office (2007), *Cost Assessment Guide*, pp. 40–41.

[94] Chart 6.2 is based on a similar chart in United States Government Accountability Office (2007), *Cost Assessment Guide,* p. 40.

[95] Sylvester and Ferrara (2003), "Conflict and Ambiguity Implementing Evolutionary Acquisition," p. 9.

[96] Steven Kosiak (2004), *Matching Resources with Requirements: Options for Modernizing the U.S. Air Force* (Washington, DC: Center for Strategic and Budgetary Assessments), pp. 58–60.

[97] Pagliano and O'Rourke (2004), *Evolutionary Acquisition and Spiral Development in DOD Programs*, p. 1.

[98] United States Government Accountability Office (2007), *Cost Assessment Guide*, p. 41.

[99] Emory Miller (2008), "Independent Program Oversight: An Answer for Major Weapon Systems Success?" *Defence Acquisition Review Journal,* April 2008, pp. 64–73, <http://www.dau.mil/pubs/arq/2008arq/ARJ47Web/ARJ47_Miller.pdf> accessed 21 December 2008.

[100] Australian Department of Defence (2008), *Going to the Next Level: The Report of the Defence Procurement and Sustainment Review* (Canberra: Department of Defence).

[101] United States Government Accountability Office (2007), *Defense Acquisitions: Improved Management and Oversight Needed to Better Control DoD's Acquisition of Services*, GAO-07-832T (Washington, DC: Government Accountability Office).

[102] Miller (2008), "Independent Program Oversight," *Defence Acquisition Review Journal*, April 2008, p. 68.

[103] United States Government Accountability Office (2007), *Defense Acquisitions: Department of Defense Actions on Program Manager Empowerment and Accountability*, GAO-08-62R (Washington, DC: Government Accountability Office), p. 6.

[104] Katherine V. Schinasi (2008), *Defense Acquisitions: Better Weapon Program Outcomes Require Discipline, Accountability, and Fundamental Changes in the Acquisition Environment* (Washington, DC: Government Accountability Office), p. 9.

[105] William A. Lucas and Richard G. Rhoades (2008), "Lessons from the Development of Army Systems," *Defense Acquisition Review Journal*, July 2008, pp. 114–131, <http://www.dau.mil/pubs/arq/2008arq/ARJ48Web/ARJ48_Lucas.pdf> accessed 26 December 2008.

[106] United States Government Accountability Office (2008), *Defense Acquisitions: A Knowledge-Based Funding Approach Could Improve Major Weapon System Program Outcomes* (Washington, DC: Government Accountability Office), p. 4.

[107] James Hasik (2008), *Arms and Innovation: Entrepreneurship and Alliances in the Twenty-First-Century Defense Industry* (Chicago: University of Chicago Press), pp. 111–135.

[108] Michael J. Sullivan (2008), *Rapid Acquisition of Mine Resistant Ambush Protected Vehicles*, GAO-08-884R (Washington, DC: Government Accountability Office), p. 1.

[109] An indefinite quantity (IDIQ) contract is a "type of indefinite delivery contract that provides for an indefinite quantity of supplies or services within stated limits, during a fixed period. The government places orders for individual requirements." United States Federal Acquisition Regulation (FAR) 16.504.

[110] Sullivan, (2008), *Rapid Acquisition of Mine Resistant Ambush Protected Vehicles*, p. 2.

[111] United States Government Accountability Office (2007), *Best Practices: An Integrated Portfolio Management Approach to Weapon System Investments Could Improve DOD's Acquisition Outcomes* (Washington, DC: Government Accountability Office), p. 3.

[112] Ibid., p. 3.

[113] Schinasi (2008), *Defense Acquisitions: Better Weapon Programs Require Discipline, Accountability, and Fundamental Changes in the Acquisition Environment* (Washington, DC: Government Accountability Office), p. 2.

[114] Andy Fainer (2008), "A Glimpse into DoD Weapon Systems Programs," *Defense Acquisition Review Journal*, July 2008, <http://www.dau.mil/pubs/arq/2008arq/ARJ48Web/ARJ48_Fainer.pdf> accessed 20 December 2008.

[115] United States Government Accountability Office (2007), *Best Practices*, p. 3.

[116] Michael A. Greiner, Kevin J. Dooley, Dan L. Shunk, and Ross T. McNutt (2002), "An Assessment of Air Force Development Portfolio Management Practices," *Acquisition Review Quarterly*, Spring 2002, p. 118.

[117] Frank Camm (2003), "Using Public-Private Partnerships Successfully in the Federal Setting" in *High Performance Government: Structure, Leadership, Incentives*, eds. Robert Klitgaard and Paul C. Light (Santa Monica, CA: RAND), p. 182.

[118] Partnerships British Columbia (2008), *Understanding Public Private Partnerships* (Victoria, BC: Partnerships British Columbia), <www.partnershipsbc.ca> accessed 1 January 2009.

[119] World Bank (2008), "Private Activity in Infrastructure Reached a New Peak in 2007," *Private Participation in Infrastructure Database: Data Update Note 13* (Washington, DC: World Bank).

[120] Deloitte (2007), *Closing the Infrastructure Gap: The Role of Public-Private Partnerships* (London: Deloitte Research), pp. 7–9.

[121] Stephen Daggett (2005), *Defense Budget: Long-Term Challenges for FY2006 and Beyond* (Washington, DC: Congressional Research Service).

[122] Ibid., p. 12.

[123] United States Congressional Budget Office (2007), *Long-Term Implications of Current Defense Plans: Summary Update for Fiscal Year 2008* (Washington, DC: Congressional Budget Office).

[124] Deloitte (2007), *Closing the Infrastructure Gap*, p. 27.

[125] The most expensive weapon system is the United States nuclear-powered aircraft carrier. A RAND study that examines options for funding aircraft carriers can be found in John Birkler, John F. Schank, James Chiesa, Giles Smith, Irv Blickstein, Ronald D. Fricker, Jr., and Dennis Rushworth (2002), *Options for Funding Aircraft Carriers* (Santa Monica, CA: RAND).

[126] Auditor General of Canada (1998), "National Defence: Buying Major Capital Equipment" in *April 1998 Report* (Ottawa: Auditor General of Canada), paragraph 4.11, <http://www.oag-bvg.gc.ca/internet/English/parl_oag_199804_04_e_9310.html> accessed 19 February 2009.

[127] Organisation for Economic Development and Cooperation (2000), *Accrual Accounting and Budgeting Practices in Member Countries: Overview,* PUMA/SBO(2000)11/REV3 (Paris: OECD).

[128] Independent Review Panel on the Modernization of Comptrollership in the Government of Canada (1997), *Report of the Independent Review Panel on the Modernization of Comptrollership in the Government of Canada* (Ottawa).

[129] Ken Warren and Cheryl Barnes (2003), "The Impact of GAAP on Fiscal Decision Making: A Review of Twelve Years' Experience with Accrual and Out-Put Based Budgets in New Zealand," *OECD Journal on Budgeting* 3, no. 4:39.

[130] Standing Committee on National Defence and Veterans Affairs (2000), *Procurement Study* (Ottawa: Standing Committee on National Defence and Veterans Affairs), <http://cmte.parl.gc.ca/Content/HOC/committee/362/ndva/reports/rp1031734/ndva04/07-ch1-e.html#INTRODUCTION> accessed 26 March 2008.

[131] Bernd Horn (2006), "Outside the Wire: Some Leadership Challenges in Afghanistan," *Canadian Military Journal* 7, no. 3:6–14.

[132] Daniel Gosselin (2007), "Navigating the Perfect Wave: The Canadian Military Facing Its Most Significant Change in 50 Years," *Canadian Military Journal*, Winter 2007–2008, pp. 83–88.

About the Author

Lieutenant-Colonel Ross Fetterly is a PhD candidate at the Royal Military College of Canada (War Studies) and is currently writing his dissertation on defence procurement. He has just completed a seven-month tour in Afghanistan as the Chief CJ8 (Finance, Procurement and Contracting) at the NATO base headquarters responsible for operating the Kandahar airfield. In October 2008, with staff from the Parliamentary Budget Office, he published a paper on the methodology for estimating the fiscal impact of the costs incurred by the Government of Canada in support of the mission in Afghanistan. His PhD fields of study are Defence Economics, Defence Policy and Defence Cost Analysis.