

Stuck in a Rut

Harper Government Overrides Canadian Army,
Insists on Buying Outdated Equipment

Michael Byers and Stewart Webb





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ABBREVIATIONS

- AEV Armoured Engineer Vehicle
- APC Armoured Personnel Carrier
- ARV Armoured Recovery Vehicle
- C³I Command, Control, Communications, and Intelligence
- CCV Close Combat Vehicle
- COIN Counterinsurgency
- DND Department of National Defence
- FMEP Force Mobility Enhancement Project
- IED Improvised Explosive Device
- IFV Infantry Fighting Vehicle
- LAV III Light Armoured Vehicle III
- LAV UP LAV III Upgrade
- LCVS Land Combat Vehicle Systems
- MGS Mobile Gun System
- MMEV Multi-Mission Effects Vehicle
- MRCV Multi-Role Combat Vehicle
- NPP Notice of Proposed Procurement
- PRT Provincial Reconstruction Team
- SOIQ Solicitation of Interest and Qualification
- SOR Statement of Operational Requirements
- TAPV Tactical Armoured Patrol Vehicle
- TUA Tow Under Armour
- TOW Tube-launched, Optically-tracked, Wire-guided
- VBCI Véhicule Blindé de Combat d'Infanterie

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Stuck in a Rut

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Introduction

Since the end of the Cold War, the Canadian Army has faced greater challenges of adaptation than the Royal Canadian Air Force or the Royal Canadian Navy. The Army was forced to shift from preparing for a “symmetric” engagement in Europe, to dealing with the very different “asymmetric” realities of Afghanistan. The threat posed by improvised explosive devices (IED) was completely unlike that posed by Soviet-built tanks. Complicating things further, halfway through the mission a radical new approach to counterinsurgency (COIN) was introduced by Canada’s principal defence partner, the United States.

One of the greatest complications for the Army was the fact that, shortly after taking office in February 2006, the Harper government had embraced the tank. At the urging of Defence Minister Gordon O’Connor, a former tank commander, the government deployed some of Canada’s aged Leopard C2s to Afghanistan, bought 80 second-hand Leopard 2A4s from the Netherlands, and borrowed some newer Leopard 2A6s from Germany.¹ Canada also purchased an additional 20 Leopard 2A6s from the Netherlands, which would be converted to the German specifications and returned to Germany.²

Not surprisingly, the tanks proved to be less than ideal for the Afghanistan mission, especially after the United States altered its approach to COIN. It will always be difficult to “win hearts and minds” with heavy armour, and despite all that armour, the flat-bottomed low-slung tanks were rather exposed to the insurgents’ new weapon of choice — the IED.³ Tanks might, in fact, be the most poorly suited form of equipment for the unconventional missions of the 21st century.

The Harper government, however, does not easily change course. Today, instead of moving away from heavy armour and embracing contemporary COIN, it is about to spend billions of dollars on Close Combat Vehicles (CCV) that are designed to accompany tanks into conventional battles.

What makes the situation all the more alarming is that the Canadian Army has reportedly told the government that it does not want or need CCVs.⁴ The Army, which has recently come under budgetary pressure from the Harper government, could use the funds for training, at a time when the Army is having difficulty maintaining a high level of readiness.⁵ This report recommends that the Harper government listen to the Army — and stop the CCV procurement before any contract is signed.

The Tank in Canada’s History

Armoured combat vehicles were a decisive addition to the battlefields of the 20th century. The tank, which arrived during the latter stages of the First World War, became the centrepiece for land operations during the Second World War. A new doctrine of warfare crafted by German General Heinz Guderian took Europe by storm.⁶ Rather than the trench warfare of the First World War, it called for a quick armoured “spearhead” and supporting mechanized infantry units to punch through enemy lines, form a “pincher movement,” and thus encircle enemy forces. The “Blitzkrieg” strategy changed the way wars were fought on land.

The first tanks fielded in Canada were British-designed, Canadian-built Mark VI Valentines, delivered just before the start of the Second World War in the summer of 1939.⁷ The first tanks used by Canada in the Second World War were the British-designed Churchill and Matilda tanks.⁸ Canada acquired U.S.-designed Sherman tanks in 1943⁹ and later deployed one battalion of Shermans in the Korean War.¹⁰

During the Cold War, most of Canada’s tanks were stationed in West Germany. In 1952–53, Canada acquired 274 British-designed Mark III Centurions.

Canada replaced these with 127 German-built Leopard 1A3s (designated C1s) in 1979.¹¹ After the 1999 Kosovo war, Canada sent five upgraded Leopard C1s (now designated C2s) to that country as part of a UN peacekeeping force.¹²

The mechanization of warfare did not stop with the tank. The need to protect soldiers in the new battlefield environment led to the development of the armoured personnel carrier (APC). In addition to armour, speed became an essential requirement for these vehicles. But for NATO, whose forces were outnumbered in Europe, there was also a need for “force multipliers” – technological innovations that equalize quantitative disparities with qualitative advantages.¹³ Nuclear weapons were the main force multiplier; however, NATO strategy also focused on disorienting and constraining the enemy by targeting Command, Control, Communications, and Intelligence (C³I) facilities.¹⁴ While tanks remained important, air power and missiles dominated NATO strategy during the later stages of the Cold War and beyond.¹⁵

Canada’s Leopard C1/C2 Fleet

The Leopard 1 tank first entered service in 1965.¹⁶ In 1979, Canada procured 127 Leopard 1A3s, which it designated as “C1s.”¹⁷ At the time, the C1s were an advanced design with a welded turret, improved sighting device, night vision capabilities, and more room for the crew.¹⁸ They had crews of four, a maximum speed of 65 km/h, and a maximum range of 600 km. The main armament was a 105 mm cannon, supplemented by two 7.62 mm machine guns and smoke grenade launchers.

During the Cold War, most of the C1s were stationed in West Germany.¹⁹ But when the Cold War ended, the need for Western forces to maintain tank fleets in Germany disappeared. Although a small number of C1s were later deployed as part of Canada’s contribution to peacekeeping in Kosovo, geopolitical developments had weakened the rationale for Canada to have a substantial number of the vehicles.

Nevertheless, in 1996, the Chrétien government announced that the C1s would receive an upgrade. The existing turrets on 123 of the tanks (designated C2s after the upgrade) were replaced with Leopard 1A5 turrets equipped with computerized fire-control systems that incorporated thermal imagers.²⁰ Adding this capability cost an estimated \$145 million.²¹ At the same time, a further \$400 million plan to install additional armour on the tanks was left unimplemented – for cost-saving reasons.²²

Canada and APCs

Along with tanks came the need for armoured personnel carriers (APC). The Grizzly entered Canadian service in 1976,²³ followed by the Bison in 1990.²⁴ The Bison has eight wheels and weighs 12.4 tons, with a maximum range of 665 km and maximum speed of 100 km/h. Many of the original 199 Bisons remain in service today as ambulances and other kinds of support vehicles.²⁵

With the end of the Cold War came an increase in UN peacekeeping missions, and with it the realization that Canada needed a more lightly armoured combat vehicle — albeit one that could provide direct fire support when necessary.

In 1991, the Mulroney government launched the \$2.8 billion Multi-Role Combat Vehicle (MRCV) project with a view to replacing its various types of APCs with a single chassis.²⁶ It settled on the TH-495, an infantry fighting vehicle (IFV) built by the German company Thyssen-Henschel, now known as Rheinmetall Landsystems, part of the Rheinmetall group.²⁷ The TH-495 was a tracked vehicle with a crew of three and room for seven infantrymen. Armed with a 25 mm rapid-fire cannon, the TH-495 was similar in appearance and weight to the American M2 Bradley Fighting Vehicle.

Thyssen-Henschel proposed to have the TH-495 built in Cape Breton by a newly established company called Bear Head Industries. However, the deal had some murky aspects, including the involvement of Karlheinz Schreiber, and was ultimately abandoned by the Mulroney government.

The Chrétien government, shortly after being elected in 1993, issued a White Paper in which it announced a shift in focus to land forces:

Most areas of defence will be cut. The relative weight of the naval, land and air establishments will be altered to allow for the transfer of more resources to where they are most needed — mainly to operational land forces. Everything is being made leaner. Everything is undergoing the closest scrutiny.²⁸

As part of the shift to land forces, the plans for a new combat vehicle were resurrected. In 1996, the Diesel Division of General Motors of Canada won a \$1.59 billion contract for 651 of its Light Armoured Vehicle IIIs (LAV IIIs).²⁹ The firm was acquired by U.S.-based General Dynamics in 2003 and became General Dynamics Land Systems-Canada.

The LAV III entered service in 1999.³⁰ It has a maximum range of 450 km and maximum speed of 100 km/hr.³¹ The LAV III comes in multiple variants, including infantry carriers, command vehicles, and forward observa-



LAV-III Before Recent LAV Upgrades / Source: Canadian Armed Forces

tion vehicles. Unspecialized variants have a 25 mm M242 Bushmaster cannon, grenade launchers and machine guns.³²

The acquisition of the LAV IIIs was a defining moment for the Canadian Army. Indeed, Lt.-General Peter Devlin has said that Canada now has a “LAV-based army” — and he expressed the view that Canadians are “the best in the world fighting [in] that vehicle.”³³

The LAV III acquisition was also a very significant commitment by the Chrétien government, in light of the more general defence cutbacks being imposed at the time. It was offset by a reduction in spending on tanks, including the limitations to the Leopard C1/C2 upgrades described above.

Retiring the Leopards

In October 2003, Liberal Defence Minister John McCallum and Chief of the Defence Staff Lt.-General Rick Hillier announced the retirement of Canada’s Leopard C2 tanks, which by this point had been in service for nearly a quar-

ter-century. They also announced that Canada would focus on acquiring the U.S. Stryker Mobile Gun System (MGS).³⁴ The Stryker MGS is based on Canada's LAV III but has a much larger, 105 mm cannon.³⁵ As David Pugliese of the *Ottawa Citizen* explained, Hillier was of the view that the "Leopards had served their purpose and, despite recently undergoing a \$145-million upgrade, were now of limited use."³⁶ Future combat scenarios required a vehicle such as the Stryker,³⁷ and it was proposed that Canada would acquire 66 of them for \$460 million.³⁸

In Hillier's own words:

Tanks are a perfect example of extremely expensive systems that sit in Canada because they are inappropriate to the operations we conduct daily around the world.... The [Stryker] MGS, in conjunction with other combat systems, will give us a much greater capability on operations such as those being conducted in Kabul, and still give us options for high-intensity combat.³⁹

Adopting the Stryker was also seen as logistically sensible because, as a variant of the LAV III, they would be easier and cheaper to maintain than a set of entirely different vehicles.

But the plan to scrap the tanks and acquire Strykers was never implemented.

Gordon O'Connor and the Return of the Tank

In February 2006, Stephen Harper became prime minister and appointed a former tank officer, Gordon O'Connor, as his minister of national defence. Within four months, O'Connor had set aside the plan to replace the Leopard C2s with Strykers — even though the Department of National Defence (DND) had already "blown up, sold or given away a little less than half of the army's fleet of 114 Leopards."⁴⁰

At the same time, Canada's role in Afghanistan was changing. As the result of a decision taken by the Paul Martin government, the Canadian Forces had just taken on the lead role in Kandahar Province. A three-phased counterinsurgency (COIN) strategy was developed: "strategic survival and reorganization; establishment of foothold bases in remote areas; and mass mobilization using tribal and religious elements."⁴¹

The Harper government's decision to send tanks to participate in a COIN operation came as a shock to many.⁴² The government, however, said the

tanks were needed to provide more protection to Canada's Provincial Reconstruction Teams (PRT), and not for direct combat missions.⁴³

Canada initially deployed 15 Leopard C2s to Afghanistan.⁴⁴ The tanks proved to be effective at knocking holes in earthen walls, which increased the mobility of Canadian infantry.⁴⁵

Then, in September 2006, the Canadian Forces led Operation Medusa — an offensive aimed at re-taking areas of Kandahar Province under Taliban control.⁴⁶ More than 400 Taliban militants were killed in battles in which they engaged the Canadian soldiers directly.⁴⁷ One of the lessons taken immediately from Operation Medusa was the need for sustained high-intensity combat operations — operations in which, the Harper government decided, tanks could play a useful role. Unfortunately, the approach taken by the Taliban soon changed, with implications that will be discussed below.

Enter the Leopard 2

By 2006, the Leopard C2s were nearing the end of their service lives. For this reason, simply delaying their retirement was not going to provide the capability that Minister O'Connor insisted was needed.

DND determined that it needed a total of 100 Leopard 2 tanks: 40 for deployed operations, 40 for training, and a further 20 for specialised functions.⁴⁸ And so, in April 2007, an agreement in principle was announced whereby Canada would purchase 80 second-hand Leopard 2A4s and 20 2A6s from the Netherlands.⁴⁹ The deal was formalized eight months later, in December 2007.⁵⁰

More advanced than the C2s, the 2A4s had flat titanium/tungsten armour, an automated fire-and-explosion suppression system, and an all-digital fire control system that could handle new ammunition types.⁵¹ However, the Leopard 2A4s still required refurbishment — a job that was done, as part of the Canada-Netherlands deal, by the original German manufacturer Krauss Maffei-Wegmann.⁵² Not all of the 100 tanks were refurbished; some were cannibalized for spare parts.⁵³

The acquisition cost of the Dutch Leopard 2A4s and 2A6s was estimated at \$650 million, plus another \$650 million for 20 years of in-service support.⁵⁴

At the same time, DND announced that it was borrowing 20 of Germany's Leopard 2A6s.⁵⁵ The 2A6s were more advanced than the 2A4s, with a longer L55 gun, an auxiliary engine, and crucially, both improved mine protection and an air-conditioning system.⁵⁶ The borrowed German 2A6s were promptly



Leopard 2A6 / Source: German Army/Katharina Winkler

deployed to Afghanistan.⁵⁷ Then, in 2008, Canada decided to purchase 15 disused Leopard 2A4s from Germany for spare parts.⁵⁸

Significantly, Germany and the Netherlands were only too glad to off-load the tanks onto Canada. After the Cold War ended, rendering large tank fleets obsolete, the two countries embarked on what was dubbed “der grosse DeutschePanzerSchlussverkauf” (the great German tank fire-sale).⁵⁹

Were Tanks Effective in Afghanistan?

In the end, the Leopard tanks were only of limited effectiveness in Afghanistan, because the Taliban quickly abandoned the “stand and fight” approach in favour of the IED. Flat underbellies are acutely vulnerable to the explosive force of a mine or IED,⁶⁰ which is why Canada later upgraded its LAV IIIs (through the LAV UP program described below) with deflective V-shaped hulls.⁶¹ But tanks cannot be modified in this way, since they are designed with low clearances so as to reduce their profiles as targets. Moreover,

the majority of a tank's armour is located in the front and side sections, not underneath. One of the reasons Canada borrowed the Leopard 2A6s from Germany is that the 2A6 has additional belly plates that provide it with somewhat improved protection against mines and IEDs.⁶²

One of the arguments for the deployment of the Leopard tanks in Afghanistan was that they would be more effective in difficult terrain than the LAV IIIs. However, the tanks also had difficulty in “cultivated areas, culverts and canals [which] presented numerous opportunities for tanks to become hopelessly mired.”⁶³

Tanks are not integral to COIN operations and can in fact hinder them, since it is difficult to “win hearts and minds” from behind heavy armour. When the Afghan government expressed a desire to acquire tanks for its army, Australian Brigadier General Adam Findlay, the deputy chief of operations for ISAF, dismissed the request: “We are making a counter-insurgency force and we have our Afghan partners asking for things we would call ‘high-end war fighting’ — tanks and what have you.”⁶⁴

In Canada's case, PRTs were deployed to repair the damage caused when the tanks were operationally deployed: for instance, damage to earthen walls.⁶⁵ The repairs were done to mollify local populations, though arguably there were other things the PRTs could have been doing instead — had they not been cleaning up after the tanks — to win the locals over.

Several of Canada's allies deployed some tanks to Afghanistan, though the United States did not do so until 2010, and only then in limited numbers.⁶⁶ Denmark sent a small detachment of Leopard 2A5 tanks to Helmand Province in 2007.⁶⁷

Significantly, the United Kingdom has a modern tank fleet but never deployed any of those vehicles in Afghanistan, though it did sometimes make use of the presence of Danish and Canadian ones.⁶⁸

Force Mobility Enhancement Project

The Harper government's decision to procure and deploy tanks quickly resulted in some unfortunate mistakes. For instance, the Statement of Operational Requirements (SOR) was incomplete, and failed to address all of the deficiencies in capability that the project was intended to remedy.⁶⁹ It was not until the Leopard 2s arrived in Afghanistan that anyone realized they could not be fitted with implements the Canadian Forces considered necessary, such as mine ploughs, mine rollers, and bulldozer blades. Indeed, the



Leopard C2 With Plough / Source: Canadian Armed Forces

Auditor General found that “no research was done to find out if these implements could actually be fitted on the tanks.”⁷⁰

For this reason, some of Canada’s old Leopard C2s were kept in Afghanistan to perform roles the better-armoured Leopard 2s could not accomplish. This was very hard on the Leopard C2 crews, since air-conditioning units had not been installed in those older vehicles.

After the Leopard 2s’ inability to operate implements became apparent, the offshoot Force Mobility Enhancement Project (FMEP) was approved by the government, in the spring of 2007.⁷¹ The FMEP entailed the purchase of 13 Armoured Engineer Vehicles (AEV) and 2 Armoured Recovery Vehicles (ARV),⁷² as well as mine ploughs, bulldozer blades and “tactical mobility implements” (i.e., mounting brackets).⁷³ The total project value of FMEP has been estimated at \$376 million.⁷⁴ The AEVs and implements are supposed to reach initial operational capability by February 2015 and full operational capability by December 2016.⁷⁵

The FMEP is part of a larger Land Combat Vehicle Systems (LCVS) project. The Close Combat Vehicle (CCV) project, which was announced in July 2009,⁷⁶ is located within the LCVS and closely associated with the FMEP.

Close Combat Vehicle

The decision to procure CCVs for Canada today is directly linked to the flawed decision, taken in 2006, to retain and grow Canada's fleet of Leopard tanks.

The purpose of the CCV is to provide "an operational capability that can operate in intimate support of the Main Battle Tank or independently within a high-intensity environment."⁷⁷ In other words, the CCV will defend Canada's Leopard 2s against infantry, in traditional battlefield situations where the tanks themselves are engaging enemy armoured vehicles. Although the LAV III could fulfill this role, the heavier armour of the CCV would provide better survivability.⁷⁸

The Solicitation of Interest and Qualification (SOIQ) to industry set out the requirements for the CCV, including a maximum range of at least 450 km and maximum speed of at least 60 km/h.⁷⁹ The CCV must carry a crew of three and have room for at least five infantry.⁸⁰ (By comparison, the LAV III can carry 6–7 infantry.)⁸¹ According to Major Howard Mark Anthony, there is no requirement that the CCV be tracked, which opens up the possibility that the vehicles might be wheeled.⁸²

The SOIQ also specifies that the CCV "must provide protection to its occupants against NATO Level 4, Kinetic Energy Threats and Artillery Threats for a full 360 degrees arc."⁸³ NATO Level 4, according to the NATO AEP-55 STANAG 4569, means that the vehicle has to provide protection against heavy machine gun fire (14.5 mm calibre).⁸⁴ The CCV must also provide protection against NATO Level 4B for Grenade and Blast Mine Threats.⁸⁵ Level 4B is a 10 kg explosive device under the centre of the vehicle.⁸⁶

Significantly, the LAV III has the same 14.5 mm calibre protection.⁸⁷ And while the LAV III's level of mine protection is not public information, the LAV UP upgrade (discussed below) includes a double V-shaped hull which likely also provides NATO Level 4B protection. In other words, the SOIQ does not require a vehicle with different traction (tracks versus wheels) or armour than Canada's recently upgraded LAV IIIs.

Nevertheless, the CCV is supposed to bridge the armoured weight gap between light (5–25 tonnes) and heavy (45 tonnes) armoured vehicles, a weight class Canada does not operate.⁸⁸ It is proposed that 108 CCVs will

be procured in four different variants: Infantry Fighting Vehicle, Forward Observation Officer, Engineer Reconnaissance, and Tactical Command configurations.⁸⁹ There is an option to procure up to 30 more vehicles and “the development and implementation of an in-service support contract.”⁹⁰ The estimated cost of the CCV project is \$2 billion.⁹¹ The in-service support contract will be bundled with the acquisition contract.⁹²

In the actual circumstances of 2013, the CCV is both redundant and out of date. This procurement is proceeding only because of the Harper government’s 2006 decision to retain and acquire tanks, and its stubborn refusal to back away from that error. As former ADM Materiel Alan Williams has commented about the CCV project, the “government [is] again politicizing the acquisition of military hardware.”⁹³

Three Unnecessary Options

The CCV procurement was mishandled from the outset, when the original Notice for Proposed Procurement (NPP) and the Solicitation of Interest and Qualification (SOIQ) disqualified every competitor for not meeting the armour requirements.⁹⁴ The SOIQ was then rewritten and all the competitors⁹⁵ — the Véhicule Blindé de Combat d’Infanterie (VBCI), the CV9035, and the Piranha 5 — were deemed compliant.

Another aspect of mishandling concerned the issue of whether the CCVs would be tracked or wheeled. In 2008, the Ottawa Citizen reported: “Defence sources say the current LAV III does not have the mobility needed for the job in off-road conditions. The likely preferred option is to go for a tracked vehicle.”⁹⁶ However, the SOIQ did not specify that the vehicles had to be tracked, and as a result, two wheeled vehicles (the VBCI and Piranha 5) entered the competition, reportedly catching DND and analysts by surprise.⁹⁷



VBCI / Source: French Armed Forces

1. VBCI

The VBCI is built by French government-owned Nexter. A wheeled vehicle, the VBCI has a maximum range of 750 km and a top speed of 100 km/h.⁹⁸ Its main armament is a 25 mm (NATO standard) cannon.⁹⁹ The VBCI has a flat-bottomed, all-welded aluminum hull onto which steel or titanium armour plates can be bolted. Due to the lighter aluminum armour, its maximum weight is 28 tonnes. The French deployed the VBCI in the recent conflict in Mali.¹⁰⁰ It is operated only by the French Army and can accommodate two crew, eight infantry and a commander.¹⁰¹



Piranha 5 / Source: General Dynamics Land Systems Canada website

2. Piranha 5

The Piranha 5 is built by General Dynamics Land Systems, the same company that built Canada's LAV IIIs. Its main armament is a 30 mm cannon made by Kongsberg.¹⁰² A wheeled vehicle, the Piranha 5 has a maximum speed of 100 km/h and maximum range of 550 km. Its armour is made of steel.¹⁰³ It has a total weight of 30 tonnes and can carry up to 8 infantry personnel.¹⁰⁴



CV9035 / Source: Wiki Commons

3. CV9035

The CV9035 is built by BAE Systems. It has a maximum speed of just 70 km/h and a maximum range of 600 km.¹⁰⁵ The CV9035's main armament is a 35 mm or 50 mm Bushmaster cannon. It is the only tracked vehicle in the competition, with a low ground clearance and flat bottom. Its steel armour plating gives it a maximum weight of 35 tonnes.¹⁰⁶ That weight, combined with the tracks, lower profile and heavier gun, make the CV9035 more like a tank than the other two competitors. It can accommodate up to 10 infantry personnel.¹⁰⁷

Evolution of COIN Operations

For decades after the Cold War, the U.S. Army made no significant changes to its counterinsurgency (COIN) doctrine — until December 2006, when a new American field manual on COIN operations was published.¹⁰⁸ The manual's lead author was General David Petraeus, who was appointed head of U.S. forces in Iraq in 2007 and head of U.S. Central Command (which includes Afghanistan) in 2008. The new “Petraeus Doctrine” was promptly implemented in both theatres.

The doctrine calls for soldiers to go outside their bases and engage with the local people in a “population-centric” approach. Step one is to secure concentrated populated areas, provide for law enforcement and engage the local population — so as to gain their trust, determine what their concerns are, and maintain the host government's legitimacy by addressing those concerns.¹⁰⁹ The theory is that, if the population does not feel isolated from its government and has the means to live adequately, this will erode any incentive to side with insurgents. In short, COIN operations are not about defeating the insurgents with force, but winning the “hearts and minds” of the indigenous population.

Tanks and CCVs do not fit well into the Petraeus Doctrine. And while heavier armour might be needed to protect against the threat from IEDs, for Canada that issue has already been addressed through the LAV UP project.

LAV III Upgrade (LAV UP)

Canada's LAV IIIs are somewhat reduced in number, 13 of the original 651 vehicles having been destroyed in Afghanistan.¹¹⁰ But the remaining LAV IIIs will soon be better than when they were new.

The LAV III upgrade project (LAV UP) was announced in 2009, the same year as the CCV project.¹¹¹ In October 2011, the \$1.064 billion contract was awarded to General Dynamics Land Systems, which is doing the work at its plant in London, Ontario.¹¹²

LAV UP is intended to improve the survivability, mobility and lethality of the LAV III.¹¹³ One upgrade includes the installation of a double V-shaped hull in the undercarriage that is designed to deflect explosive force away from the personnel inside. Additional upgrades include a more powerful engine and improvements to the drive train and suspension.¹¹⁴

Other upgrades include larger tires, air brakes and an anti-skid braking system,¹¹⁵ all of which will provide better traction. Improvements to the tur-



LAV III After LAV UP Upgrades / Source: Canadian Armed Forces

ret sights and gun control electronics will increase the range of the vehicle's gun and reduce the demands on the crew.¹¹⁶

Together, the upgrades increase the weight of the LAV III from 17,000 kg to 25,000 kg, which accounts for the need for a more powerful engine.¹¹⁷ Significantly, the new weight also puts the LAV III in the same medium-weight (25,000 kg–45,000 kg) class as the CCV.

The LAV III is fitted with a 25 mm M242 Bushmaster cannon, which is comparable to the main weapon on two of the contenders for the CCV contract. The VBCI also has a 25 mm cannon, while the Piranha 5 carries a 30 mm cannon.¹¹⁸ Only the CV9035, which can be fitted with either a 35 mm or a 50 mm cannon,¹¹⁹ carries substantially more firepower than the LAV III.

It is also noteworthy that the LAV UP project will extend the lifespan of the LAV IIIs to 2035.¹²⁰ In other words, the upgrades are so extensive that they are essentially creating new vehicles. This raises the question: After having just spent \$1.064 billion to upgrade more than 550 LAV IIIs,¹²¹ why spend another billion dollars to purchase 108 CCVs that add little in terms of capability?

An Adaptable Canadian Army

The Canadian Army saw the wisdom of the Petraeus Doctrine and followed the U.S. military in shifting its focus to low-intensity asymmetrical COIN operations. The Department of National Defence's 2009 document *Towards Land Operations 2021: Studies in Support of the Army of Tomorrow – Force Employment Concept* foresaw a force that would be “joint, interagency, multinational and public (JIMP)-enabled. Such a force would see diplomatic, defence, development and commercial resources, aligned with those of numerous other agencies, coordinated through an integrated campaign plan and applied in areas of operations as needed.”¹²² In the same document, DND recognized that the Canadian Forces will have to counter not only insurgents but also “media-savvy terrorists” and other criminal organizations.¹²³

Several recent moves by the Canadian Army manifest its desire to move towards a broader, lighter footprint, consistent with modern COIN. Prominent here has been the replacement of the Army's light patrol vehicles.

1. TAPV Procurement

In June 2012, a contract was awarded to Textron for 500 new Tactical Armoured Patrol Vehicles (TAPV).¹²⁴ The TAPVs will replace 202 Coyote light armoured reconnaissance vehicles,¹²⁵ 76 Nyala RG-31 armoured patrol vehicles,¹²⁶ some of the 1,039 “Standard Military Pattern Light Utility Vehicles, Wheeled” (Mercedes “G-wagons”)¹²⁷ as well as a portion of the remaining Bisons.¹²⁸ The TAPVs, the design of which is based on the United States' M1117 Armoured Security Vehicle,¹²⁹ will provide better protection from IEDs than any of these existing vehicles.¹³⁰

The acquisition cost of the TAPVs is estimated at \$603.3 million. In addition, Textron has been awarded a five-year in-service support contract for \$105.4 million. Additional in-service support contracts will be needed before very long. The total project cost for the 500 vehicles is estimated at \$1.25 billion.¹³¹

2. TOW II Missiles and Launchers

The Tube-launched, Optically-tracked, Wire-guided (TOW) missile system is the Canadian Forces' primary long-range anti-armour weapons system. The system requires an operator to guide the missile while in flight by keeping the target centred in crosshairs.¹³² The TOW system, which is composed of

the “launcher, sight unit, missile guidance set and the TOW encased missiles,”¹³³ is usually mounted on a vehicle. The Canadian Army has used some of its remaining M113A2 armoured personnel carriers for this purpose, with the combination being known as “TOW Under Armour” (TUA).¹³⁴ In 2004, Canada procured 33 LAV IIIs mounted with the TOW Under Armour launcher/system.¹³⁵

In the past decade, Canada has spent hundreds of millions of dollars on TOW missiles and launchers. However, in May 2012, documents leaked to the *Ottawa Citizen* revealed that 40 TOW missile systems, 33 TUA turret-mounted launchers, and 2,200 TOW missiles are being removed from service. The Canadian Army will retain just 33 TOW Improved Target Acquisition Systems.¹³⁶

An Army public affairs official, Captain Marc Greatti, was quoted as saying that the retirement of most of Canada’s TOW missile systems will have “no impact on the Canadian Army’s ability to defend Canada and protect our interests.”¹³⁷ He was right: in an age of asymmetrical COIN operations, anti-armour weapons systems are increasingly out of date.

3. Cancelling the Procurement of MMEVs

Back in 2006, the Harper government cancelled another procurement that was geared towards conventional, symmetrical warfare. In September 2005, the Paul Martin government had announced the purchase of 33 Multi-Mission Effects Vehicles (MMEV) for \$750 million.¹³⁸ The vehicles would have been equipped with a missile battery able to engage both enemy tanks and aircraft. However, asymmetrical operations (including COIN) generally take place without any threat from enemy tanks or aircraft — the kinds of threats the MMEV was intended to counter. And so in July 2006 DND asked for permission to cancel the MMEV program and use the money that would be saved on “urgently needed equipment such as automatic grenade launchers and missiles designed to destroy bunkers and other fortifications. Such equipment would be of use in Afghanistan and in future missions.”¹³⁹ The MMEV project was cancelled.¹⁴⁰

More recently, the Canadian Army made a similar request, this time concerning the CCVs.

The Canadian Army No Longer Wants the CCV

Consistent with the changing geopolitical, technological and economic climate, the Canadian Army has reportedly expressed its desire to cancel the CCV project. As David Pugliese of the *Ottawa Citizen* wrote on May 21, 2013:

The Canadian Army tried to cancel the purchase of a new armoured vehicle fleet, wanting to use the \$2 billion instead to offset budget cuts that are hurting its combat readiness.

But the Conservative government decided against scuttling the Close Combat Vehicle project, worried that the cancellation would give it yet another military procurement black eye. Instead, it is proceeding with the purchase of the new armoured fighting vehicles the military's leadership is not overly keen to acquire.¹⁴¹

Pugliese explained that the Canadian Army's request came after a 22 per cent cutback in the Canadian Army's budget, as well as "billions of dollars in contracts to purchase new tactical armoured patrol vehicles for the army, refurbished Leopard tanks, and an upgrade to the military's fleet of light armoured vehicles." Some senior members of the Canadian Forces, he reported, "saw the Close Combat Vehicle (CCV) as something that, while nice to have, is not essential at a time of cost-cutting."¹⁴²

The most serious impact of the CCV procurement may be on the Canadian Army's ability to engage in training. In December 2012, Lt.-General Peter Devlin, then the Commander of the Canadian Army, told the Senate Committee on National Security and Defence that the "real effect on me with the 22 per cent reduction is that it touches people, infrastructure and training."¹⁴³ He said the Canadian Forces were already training to a lower level than during the Afghanistan mission, with training budgets about "45-plus per cent lower."¹⁴⁴

Stuck in a rut, the Harper government is pressing ahead with the CCV procurement. As Pugliese reported in May 2013: "Industry representatives have been told that a winning bidder has been identified. That winning company will be announced when it suits the Conservative government's public relations plan."¹⁴⁵

The announcement may be imminent. Treasury Board, the cabinet committee that needs to provide final approval for the contract, is meeting tomorrow, September 19, 2013. Will the Harper government persist in ignoring the advice of the Canadian Army?

Conclusion

For some, the Harper government's recent cutbacks on defence spending have raised the spectre of another "decade of darkness" with regard to military procurement.¹⁴⁶ But it is not as if the government has stopped spending on military equipment. The problem, instead, is that it is spending the money unwisely, on equipment including Close Combat Vehicles which are designed to accompany troops into the symmetrical wars of the last century. The impact of this mistaken approach is compounded when the billions of dollars being spent on outmoded and therefore not particularly useful equipment result in deep cutbacks to training for today's complex counterinsurgency (COIN) missions. If the Canadian Army is to remain available for deployment, and if our soldiers are to be effective and safe, training must be an ongoing priority.

And so we conclude:

- **The CCV is based on outdated Cold War tank doctrine.**
- **The CCV would duplicate a capability Canada already possesses as a result of the recent LAV III upgrades.**
- **The Canadian Army does not want this \$2 billion procurement.**
- **The Harper government should not proceed with the CCV procurement.**

References

- AFP. "NATO queries Afghan tanks demand," 10 January 2013, available at <http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/international/10-Jan-2013/nato-queries-afghan-tanks-demand> (accessed 6 September 2013).
- Anthony, Major Howard Mark. "Close Combat Vehicle and Leopard 2 Main Battle Tank: Back in the Heavyweight Fight," Master's Thesis, Canadian Forces College, 2012, available at <http://www.cfc.forces.gc.ca/259/290/298/286/Anthony.pdf> (accessed 6 September 2013).
- Army-Guide.com. "LAV-25 Coyote," available at <http://www.army-guide.com/eng/product933.html> (accessed 6 September 2013).
- _____. "Leopard 2A4," available at <http://www.army-guide.com/eng/product1645.html> (accessed 6 September 2013).
- _____. "Leopard C1," available at <http://www.army-guide.com/eng/product3489.html> (accessed 6 September 2013).
- Army-Technology.com. "VBCI Wheeled Infantry Fighting Vehicle, France," available at <http://www.army-technology.com/projects/vbci/> (accessed 6 September 2013).
- _____. "Leopard 2," available at <http://www.army-technology.com/projects/leopard/> (accessed 6 September 2013).
- BAE Hägglunds. "CV9035 DK: Armoured Fighting Vehicle," 2007, available at http://www.forsvaret.dk/fmt/documents/fmt/lokale%20resurser/projekter%20h%C3%A6r/infanterikamp%C3%B8ret%C3%B8jer/default/faktaikk_f9a343f5-6a7d-4abd-ba2e-182a7cc492b5.pdf (accessed 6 September 2013).
- Baker, Major Douglas. "The Relevance of Armor in Counterinsurgency Operations," Master's thesis, U.S. Army Command and General Staff College, 2012, available at <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA562878> (accessed 6 September 2013).
- BBC News, "US to deploy tanks for first time in Afghanistan," 19 November 2010, available at <http://www.bbc.co.uk/news/world-us-canada-11800044> (accessed 6 September 2013).

- _____. "Nato hails Afghan mission success," 17 September 2006, available at <http://news.bbc.co.uk/2/hi/europe/5354208.stm> (accessed 6 September 2013).
- Berthiaume, Lee. "Harper government's defence spending cuts raise spectre of another 'decade of darkness,'" *National Post*, 20 March 2013, available at <http://news.nationalpost.com/2013/03/20/harper-governments-defence-spending-cuts-raise-spectre-of-another-decade-of-darkness> (accessed 6 September 2013).
- _____. "Canadian military lost 34 vehicles in Afghanistan, 359 damaged," 19 July 2012, available at <http://o.canada.com/2012/07/19/78433/> (accessed 6 September 2013).
- Canadian American Strategic Review, "Background – 'LAV UP' – the GDLS-C LAV III Upgrade Project," 10 November 2012, available at <http://www.casr.ca/bg-army-armour-lav-upgrade.htm> (accessed 6 September 2013).
- _____. "TAPV: Contract Award for the Tactical Armoured Patrol Vehicle," June 2012, available at <http://www.casr.ca/doc-dnd-tapv-award.htm> (accessed 6 September 2013).
- _____. "Canadian Forces Armour – Leopard 2A6M CAN Main Battle Tank," 8 February 2012, available at <http://www.casr.ca/101-army-armour-leopard-2a6m.htm> (accessed 6 September 2013).
- _____. "Background – Close Combat Vehicle – Nexter/Renault VBCI 25 IFV," 18 January 2012, available at <http://www.casr.ca/bg-army-ccv-nexter-vbci.htm> (accessed 6 September 2013).
- _____. "Background – Close Combat Vehicle – GDLS-Canada Piranha 5 IFV," 28 September 2011, available at <http://www.casr.ca/bg-army-ccv-piranha5.htm> (accessed 6 September 2013).
- _____. "Background – CF Multi-Mission Effects Vehicle (MMEV) Project," 10 September 2010, available at <http://www.casr.ca/bg-lav-mmev-project.htm> (accessed 6 September 2013).
- _____. "Companions for the Leopards: the Close Combat Vehicle (CCV) Project - MERX Notice of Proposed Procurement (NNP/SO1Q)," September 2010, available at <http://www.casr.ca/doc-npp-ccv-revised.htm> (accessed 6 September 2013).
- _____. "CCV: Close Combat Vehicle – Details of Tactical Requirements," October 2009, available at <http://www.casr.ca/doc-dnd-armour-ccv-update.htm> (accessed 10 September 2013).
- _____. "Background – Close Combat Vehicle – GDLS-Canada Piranha 5 IFV," available at <http://www.casr.ca/bg-army-ccv-piranha5.htm> (accessed 6 September 2013).
- _____. "Background – Close Combat Vehicle – BAE Hägglunds CV9035 MkIII," available at <http://www.casr.ca/bg-army-ccv-CV9035.htm> (accessed 6 September 2013).
- _____. "CCV – Future Land Combat Systems' Close Combat Vehicle," July 2009, available at <http://www.casr.ca/doc-dnd-armour-ccv.htm> (accessed 6 September 2013).
- _____. "Canadian Forces Armour – Leopard 2A4M CAN Main Battle Tank," <http://www.casr.ca/101-army-armour-leopard-2a4m.htm> (accessed 6 September 2013).
- _____. "Force Mobility Enhancement Project," July 2009, <http://www.casr.ca/doc-dnd-armour-fme-aev-arv.htm> (accessed 6 September 2013).
- Canadian Army. "Bison Armoured Vehicle," 10 July 2013, available at <http://www.army-armee.forces.gc.ca/en/vehicles/bison-armoured-vehicle.page?> (accessed 10 September 2013).
- _____. "Light Armoured Vehicle (LAV) III," 28 June 2013, <http://www.army-armee.forces.gc.ca/en/vehicles/light-armoured-vehicle.page?> (accessed 10 September 2013).
- CanadianForcesMilitary.com. "TOW," available at <http://canadianforcesmilitary.com/?s=tow> (accessed 6 September 2013).

- Canadian Press. "Cost of battle tanks double initial estimate, O'Connor reveals," 18 May 2007, available at <http://www.cbc.ca/news/canada/story/2007/05/17/tanks.html> (accessed 6 September 2013).
- CanadianSoldiers.com. "Main Battle Tank," available at <http://www.canadiansoldiers.com/vehicles/tanks/mainbattletanks.htm> (accessed 6 September 2013).
- _____. "TOW Missile," 25 August 2013, available at <http://www.canadiansoldiers.com/weapons/ordnance/tow.htm> (accessed 6 September 2013).
- Canwest News Service. "Tanks going to Afghanistan after all," 9 September 2006, available at <http://www.canada.com/topics/news/world/story.html?id=23e65690-7e71-49b2-8db6-33f71acb6aef> (accessed 6 September 2013).
- CBC News. "Ottawa to buy old German tanks as spare parts for Afghan mission," 20 February 2008, available at <http://www.cbc.ca/news/canada/story/2008/02/20/mackay-tanks.html> (accessed 6 September 2013).
- _____. "In depth: Afghanistan Canada's equipment," 18 September 2006, available at <http://www.cbc.ca/news/background/afghanistan/cdnequipment.html#gwagon> (accessed 6 September 2013).
- Chicago Tribune. "Lighter vehicles to replace battle tanks," 30 October 2003, available at http://articles.chicagotribune.com/2003-10-30/news/0310300173_1_general-dynamics-corp-stryker-tanks (accessed 6 September 2013).
- Chief Review Services. "Internal Audit: Tactical Armoured Patrol Vehicle (TAPV)," November 2011 available at <http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/2011/P0951-eng.pdf> (accessed 6 September 2013).
- Deagel.com. "MMEV," 18 August 2013, available at http://www.deagel.com/Air-Defense-Systems/MMEV_a000316002.aspx (accessed 10 September 2013).
- Defence-Aerospace.com. "The Tank Replacement Project," available at <http://www.defence-aerospace.com/article-view/feature/110383/canada-details-tank-replacement-project.html> (accessed 10 September 2013).
- Defense Industry Daily. "FLCV: Canada Looks to Upgrade Its Armor," 30 January 2013, available at <http://www.defenseindustrydaily.com/canada-looks-to-upgrade-its-armor-in-afghanistan-05190/> (accessed 6 September 2013).
- _____. "More Leopard-2s for sale, sold," 27 November 2007, available at <http://www.defenseindustrydaily.com/more-leopard-2s-for-sale-sold-04316/>
- Department of National Defence. "Backgrounder – Close Combat Vehicle (CCV) Project," 6 September 2012, available at <http://www.forces.gc.ca/en/business-equipment/close-combat-vehicle.page> (accessed 6 September 2013).
- _____. "News Release – Minister Fantino highlights support for Canadian Army and Canadian Workers," 8 June 2012, available at <http://www.forces.gc.ca/en/news/article.page?doc=minister-fantino-highlights-support-for-canadian-army-and-canadian-workers/hgq87xso> (accessed 6 September 2013).
- _____. "Backgrounder – Force Mobility Enhancement Project," 16 May 2012, available at <http://www.forces.gc.ca/en/news/article.page?doc=force-mobility-enhancement-project/hgq87xup> (accessed 6 September 2013).
- _____. "Force Mobility Enhancement," available at <http://www.forces.gc.ca/en/business-equipment/force-mobility-enhancement.page> (accessed 6 September 2013).

Government of Canada. "History of Canada's Engagement in Afghanistan 2001–12," 10 July 2013, available at <http://www.afghanistan.gc.ca/canada-afghanistan/progress-progres/timeline-chrono.aspx?lang=eng> (accessed 6 September 2013).

General Dynamics Land Systems, "LAV III Brochure," 2000, <http://www.generaldynamics.com/news/press-releases/2000/LAV%20Info%20Brochure2.pdf> (accessed 6 September 2013).

_____. "LAV UP," available at <http://www.gdlsCanada.com/index.php/products/light-armoured-vehicles-lav/lav-up> (accessed 6 September 2013).

General Dynamics European Land Systems. "Wheeled Vehicles – Piranha 5," January 2013, available at http://www.gdels.com/brochures/piranha_5_eng.pdf (accessed 6 September 2013).

_____. "Wheeled Vehicles: Piranha," September 2011, available at http://www.gdels.com/esp/brochures/wheeled_piranha.pdf (accessed 6 September 2013).

Federation of American Scientists. "VIII – HYPERWAR: The Legacy of DESERT STORM," available at <http://www.fas.org/spp/aircraft/parto8.htm> (accessed 10 September 2013).

Gizewski, Peter. "The Future of Security Environment," in *Towards Land Operations 2021: Studies in Support of the Army of Tomorrow – Force Employment Concept*, Department of National Defence, edited by Major Andrew B. Godefroy and Mr. Peter Gizewski, 2009, available at http://publications.gc.ca/collections/collection_2011/dn-nd/D2-188-1-2009-eng.pdf (accessed 6 September 2013).

_____. and Rostek, Lieutenant-Colonel Mike. 2009. "Towards JIMP Capable Land Force," in *Towards Land Operations 2021: Studies in Support of the Army of Tomorrow – Force Employment Concept*, Department of National Defence, edited by Major Andrew B. Godefroy and Mr. Peter Gizewski, available at http://publications.gc.ca/collections/collection_2011/dn-nd/D2-188-1-2009-eng.pdf (accessed 6 September 2013).

Guderian, Major-General Heinz. *Achtung Panzer!: The Development of Armoured Forces, Their Tactics and Operational Potential*. London: Cassell Publishing, 2000.

Headquarters of the Department of the Army. "Counterinsurgency," December 2006, available at <http://www.fas.org/irp/doddir/army/fm3-24.pdf> (accessed 6 September 2013).

Hodge, Nathan. "General Dynamics Wins Upgraded LAV III Contract From Canada," 24 August 2004, available at <http://www.defensedaily.com/articles/dt/2004/dt08240403.htm> (accessed 6 September 2013).

IHS Janes. "LAV toughens up," 14 June 2012, available at <http://www.ihs.com/events/exhibitions/eurosatory-2012/news/jun-14/english/LAV-toughens-up.aspx> (accessed 6 September 2013).

Komarow, Steven, "Tanks take a beating in Iraq," *USA Today*, 29 March 2005, available at http://usatoday30.usatoday.com/news/world/iraq/2005-03-29-abrams-tank-a_x.htm (accessed 10 September 2013)

Loyal Edmonton Regiment Military Museum. "Kosovo," 2010, available at <http://www.lermuseum.org/en/canadas-military-history/1945-to-present/kosovo/> (accessed 6 September 2013).

Maloney, Sean M. "A Violent Impediment: the Evolution of Insurgent Operations in Kandahar Province 2003–07," *Small Wars & Insurgencies* 19 (June 2008): 201–220.

Mason, R.A. "The Air War in the Gulf." *Survival* 33 (May/June 1991): 211–229.

McKenzie, Stephen. "Why does the British Army have more horses than tanks?" 19 June 2013, available at <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-22951548> (accessed 6 September 2013).

- Mehta, Aaron, "The Army tank that could not be stopped," The Centre for Public Integrity, 30 July 2012, available at <http://www.publicintegrity.org/2012/07/30/10325/army-tank-could-not-be-stopped> (accessed 10 September 2013).
- Military Factory.com. "Leopard 1 MBT – Main Battle Tank," available at http://www.militaryfactory.com/armor/detail.asp?armor_id=58 (accessed 6 September 2013).
- Military Today. "Bison APC," available at <http://www.military-today.com/apc/bison.htm> (accessed 6 September 2013).
- _____. "Grizzly APC," available at http://www.military-today.com/apc/grizzly_apc.htm (accessed 6 September 2013).
- Ministry of Defence of Singapore. "Swedish Versatility," November 2007, available at http://www.mindef.gov.sg/imindef/publications/cyberpioneer/weapon/2007/novo7_weapon.html (accessed 6 September 2013).
- NATO. "Procedures for evaluating the protection level of logistic and light armoured vehicles volume 1," February 2005, NATO AEP-55 STANAG 4569.
- Non-Military Armoured Vehicles. "Standards for Opaque Armour," available at <http://www.n-mav.com/protection-standards/stanag-4569-opaque-armor/> (accessed 6 September 2013).
- Office of the Auditor General. "Chapter 5: Acquiring Vehicles for Use in Afghanistan," fall 2009, available at http://www.oag-bvg.gc.ca/internet/docs/parl_oag_200911_05_e.pdf (accessed 6 September 2013).
- Ottawa Citizen. "Army kicks treads in used tank market," 1 November 2006, available at <http://www.canada.com/ottawacitizen/news/story.html?id=5a1ade56-4d99-498f-9a3d-f3f9a22a85f6>
- _____. "Army backtracks on plan to ditch armoured tanks," 9 July 2006, available at <http://www.canada.com/ottawacitizen/news/story.html?id=f103c834-10c6-4e79-971b-1e6ab894ef34> (accessed 6 September 2013).
- _____. "The return of the Leopard," 8 July 2006, <http://www.canada.com/ottawacitizen/news/observer/story.html?id=95b4c9e5-de13-4425-bc87-218c1031583c> (accessed 6 September 2013).
- Perry, William J. "Desert Storm and Deterrence." *Foreign Affairs* 70 (fall 1991): 66–82.
- Pike, John. "M1128 Stryker Mobile Gun System," <http://www.globalsecurity.org/military/systems/ground/iav-mgs.htm> (accessed 6 September 2013).
- Potter, Mitch. "US military thought Canadian efforts fell short in Kandahar," 22 June 2012, available at http://www.thestar.com/news/world/2012/06/22/us_military_thought_canadian_efforts_fell_short_in_kandahar.html (accessed 6 September 2013).
- Public Works and Government Services Canada. "Armoured Vehicles," 8 February 2013, <http://www.tpsgc-pwgsc.gc.ca/app-acq/stamgp-lamsmp/pvb-avp-eng.html#no1> (accessed 6 September 2013).
- _____. "Close Combat Vehicle (CCV) Project: Solicitation of Interest and Qualification," 15 December 2012, Solicitation No. W6508-10CC01/G
- Pugliese, David. "An Announcement of the Winning Bid on the Close Combat Vehicle Sometimes in July?" *Ottawa Citizen*, 13 June 2013, available at <http://blogs.ottawacitizen.com/2013/06/13/an-announcement-of-the-winning-bid-on-the-close-combat-vehicle-sometime-in-july/> (accessed 6 September 2013).

- _____. "Army tried to scuttle combat vehicle purchase amid deep cuts," 21 May 2013, available at <http://www.ottawacitizen.com/business/Army+tried+scuttle+combat+vehicle+purchase+amid+deep+cuts/8416041/story.html> (accessed 6 September 2013).
- _____. "Photos: VBCI being used in Mali," 17 February 2013, available at <http://blogs.ottawacitizen.com/2013/02/17/photos-vbci-being-used-in-mali/> (accessed 10 September 2013)
- _____. "Canadian Army studies its direct fire capability as its gets ready to divest itself of some TOW systems," *Ottawa Citizen*, 28 May 2012, available at <http://blogs.ottawacitizen.com/2012/05/28/canadian-army-studies-its-direct-fire-capability-as-it-gets-ready-to-divest-itself-of-some-tow-systems/> (accessed 6 September 2013).
- Priestley, Stephen. "Leopard-kampvogne til Afghanistan?: A Little Help from our Friends The Danish Army is Prepared to Deploy Tanks to Helmand Province," 27 October 2007, available at <http://www.casr.ca/ft-leopard-2a5-denmark.htm> (accessed 10 September 2013).
- RUSI Vancouver. "Canada's Leopards," available at <http://www.rusivancouver.ca/Downloads/canadas%20leopards.pdf> (accessed 6 September 2013).
- Rutkay, David. "DhV: Canadian Army next-generation armoured vehicles," 31 May 2012, available at <http://www.army-technology.com/features/featuredssi-dvh-LAV-111-canadian-army> (accessed 6 September 2013).
- Stone, Major J. Craig. "An Examination of the Armoured Personnel Carrier Replacement Project." *Canadian Military Journal* Summer 2001, p. 60, available at <http://www.journal.forces.gc.ca/v02/no2/doc/59-66-eng.pdf> (accessed 6 September 2013).
- Standing Senate Committee on National Security and Defence. "Proceedings of the Standing Senate Committee on National Security and Defence: Issue 11 — Evidence — Meeting of December 3, 2012," available at <http://www.parl.gc.ca/content/sen/committee/411/SECD/11EV-49878-E.HTM> (accessed 6 September 2013).
- Wallace, Michael. "Leopard Tanks and the Deadly Dilemmas of the Canadian Mission in Afghanistan," February 2007, available at http://www.policyalternatives.ca/sites/default/files/uploads/publications/National_Office_Pubs/2007/Leopard_Tanks.pdf (accessed 6 September 2013).

Notes

1 Defence-Aerospace.com, “The Tank Replacement Project,” available at <http://www.defense-aerospace.com/article-view/feature/110383/canada-details-tank-replacement-project.html> (accessed 10 September 2013).

2 Ibid.

3 See, e.g., Steven Komarow, “Tanks take a beating in Iraq,” *USA Today*, 29 March 2005, available at http://usatoday30.usatoday.com/news/world/iraq/2005-03-29-abrams-tank-a_x.htm (accessed 10 September 2013); Aaron Mehta, “The Army tank that could not be stopped,” The Centre for Public Integrity, 30 July 2012, available at <http://www.publicintegrity.org/2012/07/30/10325/army-tank-could-not-be-stopped> (accessed 10 September 2013)

4 David Pugliese, “Army tried to scuttle combat vehicle purchase amid deep cuts,” *Ottawa Citizen*, 21 May 2013 available at <http://www.ottawacitizen.com/business/Army+tried+scuttle+combat+vehicle+purchase+amid+deep+cuts/8416041/story.html> (accessed 6 September 2013).

5 Standing Senate Committee on National Security and Defence, “Proceedings of the Standing Senate Committee on National Security and Defence: Issue 11 – Evidence – Meeting of December 3, 2012,” available at <http://www.parl.gc.ca/content/sen/committee/411/SECD/11EV-49878-E.HTM> (accessed 6 September 2013).

6 Major-General Heinz Guderian, *Achtung Panzer!: The Development of Armoured Forces, Their Tactics and Operational Potential* (London: Cassell Publishing, 2000).

7 CanadianSoldiers.com, “Main Battle Tank,” available at <http://www.canadiansoldiers.com/vehicles/tanks/mainbattletanks.htm> (accessed 6 September 2013).

8 Ibid.

9 Ibid.

10 Ibid.

11 Ibid.

- 12** Loyal Edmonton Regiment Military Museum, “Kosovo,” 2010, available at <http://www.lermuseum.org/en/canadas-military-history/1945-to-present/kosovo/> (accessed 6 September 2013).
- 13** William J. Perry, “Desert Storm and Deterrence,” *Foreign Affairs* 70 (fall 1991), 69.
- 14** Federation of American Scientists, “VIII — HYPERWAR: The Legacy of DESERT STORM,” available at <http://www.fas.org/spp/aircraft/parto8.htm> (accessed 10 September 2013).
- 15** R.A. Mason, “The Air War in the Gulf,” *Survival* 33 (May/June 1991): 211–229.
- 16** Military Factory.com, “Leopard 1 MBT — Main Battle Tank,” available at http://www.militaryfactory.com/armor/detail.asp?armor_id=58 (accessed 6 September 2013).
- 17** CanadianSoldiers.com, “Main Battle Tank.”
- 18** Military Factory.com, “Leopard 1 MBT — Main Battle Tank.”
- 19** CanadianSoldiers.com, “Main Battle Tank.”
- 20** Army Guide, “Leopard C1,” available at <http://www.army-guide.com/eng/product3489.html> (accessed 6 September 2013).
- 21** Ibid.
- 22** CanadianSoldiers.com, “Main Battle Tank.”
- 23** Military Today, “Grizzly APC,” available at http://www.military-today.com/apc/grizzly_apc.htm (accessed 6 September 2013).
- 24** Military Today, “Bison APC,” available at <http://www.military-today.com/apc/bison.htm> (accessed 6 September 2013).
- 25** Ibid.; see also Canadian Army, “Bison Armoured Vehicle” 10 July 2013, available at <http://www.army-armee.forces.gc.ca/en/vehicles/bison-armoured-vehicle.page?> (accessed 6 September 2013).
- 26** Major J. Craig Stone, “An Examination of the Armoured Personnel Carrier Replacement Project,” *Canadian Military Journal* Summer 2001, p. 60 available at <http://www.journal.forces.gc.ca/v02/no2/doc/59-66-eng.pdf> (accessed 6 September 2013).
- 27** Army Guide, “R-495,” available at <http://www.army-guide.com/eng/product4317.html>
- 28** Government of Canada, “1994 White Paper on Defence,” 1994, p. 6 available at http://publications.gc.ca/collections/collection_2012/dn-nd/D3-6-1994-eng.pdf
- 29** Industry Canada, “Light Armoured Vehicle - Armoured Personnel Carrier (LAV - APC),” 12 August 2008, available at <http://www.ic.gc.ca/eic/site/o43.nsf/eng/00021.html>
- 30** Military-Today.com, “LAV III Kodiak Armoured Personnel Carrier,” 1 January 2013, available at <http://www.military-today.com/apc/kodiak.htm> (accessed 6 September 2013).
- 31** Ibid.
- 32** Canadian Army, “Light Armoured Vehicle (LAV) III,” 28 June 2013, <http://www.army-armee.forces.gc.ca/en/vehicles/light-armoured-vehicle.page?> (accessed 6 September 2013).
- 33** David Pugliese, “LAV-3 Upgrade Still a Priority for Canada,” 17 July 2011, available at <http://www.defensenews.com/article/20110717/DEFBEAT06/%20107170309/LAV-3-Upgrade-Still-a-Priority-for-Canada> (accessed 6 September 2013).
- 34** Ottawa Citizen, “The return of the Leopard,” 8 July 2006, <http://www.canada.com/ottawacitizen/news/observer/story.html?id=95b4c9e5-de13-4425-bc87-218c1031583c> (accessed 6 September 2013).

- 35** John Pike, "M1128 Stryker Mobile Gun System," <http://www.globalsecurity.org/military/systems/ground/iav-mgs.htm> (accessed 6 September 2013).
- 36** Ottawa Citizen, "The return of the Leopard."
- 37** Ibid.
- 38** Chicago Tribune, "Lighter vehicles to replace battle tanks," 30 October 2003, available at http://articles.chicagotribune.com/2003-10-30/news/0310300173_1_general-dynamics-corp-stryker-tanks (accessed 6 September 2013).
- 39** Ottawa Citizen, "The return of the Leopard."
- 40** Ottawa Citizen, "Army kicks treads in used tank market," 1 November 2006, available at <http://www.canada.com/ottawacitizen/news/story.html?id=5a1ade56-4d99-498f-9a3d-f3f9a22a85f6> (accessed 6 September 2013).
- 41** Sean M. Maloney, "A violent impediment: the evolution of insurgent operations in Kandahar province 2003–07," *Small Wars & Insurgencies* 19 (June 2008):2, p. 211.
- 42** Canwest News Service, "Tanks going to Afghanistan after all," 9 September 2006, available at <http://www.canada.com/topics/news/world/story.html?id=23e65690-7e71-49b2-8db6-33f71acb6aef> (accessed 6 September 2013).
- 43** Ibid.
- 44** Michael Wallace, "Leopard Tanks and the Deadly Dilemmas of the Canadian Mission in Afghanistan," February 2007, p. 1, available at http://www.policyalternatives.ca/sites/default/files/uploads/publications/National_Office_Pubs/2007/Leopard_Tanks.pdf (accessed 6 September 2013).
- 45** Major Douglas Baker, "The Relevance of Armor in Counterinsurgency Operations," Masters thesis, U.S. Army Command and General Staff College, 2012, p. 73, available at <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA562878> (accessed 6 September 2013).
- 46** BBC News, "Nato hails Afghan mission success," 17 September 2006, available at <http://news.bbc.co.uk/2/hi/europe/5354208.stm> (accessed 6 September 2013); see also Government of Canada, "History of Canada's Engagement in Afghanistan 2001–12," 10 July 2013, available at <http://www.afghanistan.gc.ca/canada-afghanistan/progress-progres/timeline-chrono.aspx?lang=eng> (accessed 6 September 2013).
- 47** BBC News, "Nato hails Afghan mission success," 17 September 2006, available at <http://news.bbc.co.uk/2/hi/europe/5354208.stm> (accessed 6 September 2013).
- 48** Defense Industry Daily, "Tanks for the Lesson: Leopards, too, for Canada."
- 49** RUSI Vancouver, "Canada's Leopards," p. 9, available at <http://www.rusivancouver.ca/Downloads/canadas%20leopards.pdf> (accessed 6 September 2013).
- 50** Ibid., p. 8.
- 51** Army Guide, "Leopard 2A4," available at <http://www.army-guide.com/eng/product1645.html> (accessed 6 September 2013).
- 52** Canadian American Strategic Review, "Canadian Forces Armour - Leopard 2A4M CAN Main Battle Tank," <http://www.casr.ca/101-army-armour-leopard-2a4m.htm> (accessed 6 September 2013).
- 53** Office of the Auditor General, "Chapter 5: Acquiring Vehicles for Use in Afghanistan," Fall 2009, p. 23, available at http://www.oag-bvg.gc.ca/internet/docs/parl_oag_200911_05_e.pdf (accessed 6 September 2013).

- 54** Canadian Press, “Cost of battle tanks double initial estimate, O’Connor reveals,” 18 May 2007, available at <http://www.cbc.ca/news/canada/story/2007/05/17/tanks.html> (accessed 6 September 2013).
- 55** Office of the Auditor General, “Chapter 5: Acquiring Vehicles for Use in Afghanistan,” p. 7.
- 56** Army Technology, “Leopard 2,” available at <http://www.army-technology.com/projects/leopard/> (accessed 6 September 2013).
- 57** Office of the Auditor General, “Chapter 5: Acquiring Vehicles for Use in Afghanistan,” p. 22.
- 58** CBC News, “Ottawa to buy old German tanks as spare parts for Afghan mission,” 20 February 2008, available at <http://www.cbc.ca/news/canada/story/2008/02/20/mackay-tanks.html> (accessed 6 September 2013).
- 59** Defence Industry Daily, “More Leopard-2s for sale, sold,” 27 November 2007, available at <http://www.defenseindustrydaily.com/more-leopard-2s-for-sale-sold-04316/> (accessed 6 September 2013).
- 60** Steven Komarow, “Tanks take a beating in Iraq”; Aaron Mehta, “The Army tank that could not be stopped.”
- 61** General Dynamics Land Systems, “LAV UP,” available at <http://www.gdlsCanada.com/index.php/products/light-armoured-vehicles-lav/lav-up> (accessed 6 September 2013).
- 62** Canadian American Strategic Review, “Canadian Forces Armour — Leopard 2A6M CAN Main Battle Tank,” 8 February 2012, available at <http://www.casr.ca/101-army-armour-leopard-2a6m.htm> (accessed 6 September 2013).
- 63** Major Baker, “The Relevance of Armor in Counterinsurgency Operations,” p. 76.
- 64** AFP, “NATO queries Afghan tanks demand,” 10 January 2013, available at <http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/international/10-Jan-2013/nato-queries-afghan-tanks-demand> (accessed 6 September 2013).
- 65** Major Baker, “The Relevance of Armor in Counterinsurgency Operations,” p. 73.
- 66** BBC News, “US to deploy tanks for first time in Afghanistan,” 19 November 2010, available at <http://www.bbc.co.uk/news/world-us-canada-11800044>
- 67** Stephen Priestley, “*Leopard-kampvogne* til Afghanistan?: A Little Help from our Friends The Danish Army is Prepared to Deploy Tanks to Helmand Province,” 27 October 2007, available at <http://www.casr.ca/ft-leopard-2a5-denmark.htm> (accessed 6 September 2013).
- 68** Stephen McKenzie, “Why does the British Army have more horses than tanks?” 19 June 2013, available at <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-22951548>
- 69** Office of the Auditor General, “Chapter 5: Acquiring Vehicles for Use in Afghanistan,” p. 9.
- 70** *Ibid.*, p. 10.
- 71** Office of the Auditor General, “Chapter 5: Acquiring Vehicles for Use in Afghanistan,” p. 27.
- 72** Canadian American Strategic Review, “Force Mobility Enhancement Project,” July 2009, available at <http://www.casr.ca/doc-dnd-armour-fme-aev-arv.htm> (accessed 6 September 2013); see also Department of National Defence, “Force Mobility Enhancement,” available at <http://www.forces.gc.ca/en/business-equipment/force-mobility-enhancement.page> (accessed 6 September 2013).
- 73** Canadian American Strategic Review, “Force Mobility Enhancement Project.”

- 74** Public Works and Government Services Canada, “Armoured Vehicles,” 8 February 2013, available at <http://www.tpsgc-pwgsc.gc.ca/app-acq/stamgp-lamsmp/pvb-avp-eng.html#no1> (accessed 6 September 2013).
- 75** Department of National Defence, “Backgrounder – Force Mobility Enhancement Project,” 16 May 2012, available at <http://www.forces.gc.ca/en/news/article.page?doc=force-mobility-enhancement-project/hgq87xup> (accessed 6 September 2013).
- 76** Department of National Defence, “Backgrounder – Close Combat Vehicle (CCV) Project,” 6 September 2012, available at <http://www.forces.gc.ca/en/business-equipment/close-combat-vehicle.page>
- 77** Department of National Defence, “Backgrounder – Close Combat Vehicle (CCV) Project.”
- 78** Canadian American Strategic Review, “CCV: Close Combat Vehicle – Details of Tactical Requirements,” October 2009, available at <http://www.casr.ca/doc-dnd-armour-ccv-update.htm> (accessed 6 September 2013).
- 79** Public Works and Government Services Canada, “Close Combat Vehicle (CCV) Project: Solicitation of Interest and Qualification,” Solicitation No. W6508-10CC01/G, 15 December 2012, p. A-5.
- 80** Public Works and Government Services Canada, “Close Combat Vehicle (CCV) Project: Solicitation of Interest and Qualification,” p. A-10 & D-2.
- 81** Military-Today.com, “LAV III Kodiak Armoured Personnel Carrier.”
- 82** Major Howard Mark Anthony, “Close Combat Vehicle and Leopard 2 Main Battle Tank: Back in the Heavyweight Fight,” Master’s Thesis, Canadian Forces College, 2012, p. 30, available at <http://www.cfc.forces.gc.ca/259/290/298/286/Anthony.pdf> (accessed 6 September 2013).
- 83** Public Works and Government Services Canada, “Close Combat Vehicle (CCV) Project: Solicitation of Interest and Qualification.” p. A-6.
- 84** NATO, “Procedures for evaluating the protection level of logistic and light armoured vehicles volume 1,” NATO AEP-55 STANAG 4569, February 2005, p. A-24.
- 85** Public Works and Government Services Canada, “Close Combat Vehicle (CCV) Project: Solicitation of Interest and Qualification,” p. A-8
- 86** Non-Military Armoured Vehicles, “Standards for Opaque Armour,” available at <http://www.n-mav.com/protection-standards/stanag-4569-opaque-armor/> (accessed 6 September 2013).
- 87** General Dynamics Land Systems, “LAV III,” 2000, available at <http://www.generaldynamics.com/news/press-releases/2000/IAV%20Info%20Brochure2.pdf> (accessed 6 September 2013).
- 88** Department of National Defence, “Backgrounder – Close Combat Vehicle (CCV) Project.”
- 89** Ibid.
- 90** Ibid.
- 91** Pugliese, “Army tried to scuttle combat vehicle purchase amid deep cuts.”
- 92** Canadian American Strategic Review, “CCV – Future Land Combat Systems’ Close Combat Vehicle,” July 2009, available at <http://www.casr.ca/doc-dnd-armour-ccv.htm> (accessed 6 September 2013).
- 93** Pugliese, “Army tried to scuttle combat vehicle purchase amid deep cuts.”
- 94** Canadian American Strategic Review, “Companions for the Leopards: the Close Combat Vehicle (CCV) Project – MERX Notice of Proposed Procurement (NNP/SOIQ),” September 2010, available at <http://www.casr.ca/doc-npp-ccv-revised.htm> (accessed 6 September 2013).

- 95** David Pugliese, “An Announcement of the Winning Bid on the Close Combat Vehicle Sometimes in July?” *Ottawa Citizen*, 13 June 2013, available at <http://blogs.ottawacitizen.com/2013/06/13/an-announcement-of-the-winning-bid-on-the-close-combat-vehicle-sometime-in-july/> (accessed 6 September 2013).
- 96** Defense Industry Daily, “FLCV: Canada Looks to Upgrade Its Armor,” 30 January 2013, available at <http://www.defenseindustrydaily.com/canada-looks-to-upgrade-its-armor-in-afghanistan-05190/>
- 97** Canadian American Strategic Review, “BG — Future Combat Systems — Close Combat Vehicle — Overview,” 5 September 2012, available at <http://www.casr.ca/bg-army-close-combat-vehicle.htm> (accessed 6 September 2013).
- 98** Canadian American Strategic Review, “Background — Close Combat Vehicle — Nexter/Renault VBCI 25 IFV,” 18 January 2012, available at <http://www.casr.ca/bg-army-ccv-nexter-vbci.htm> (accessed 6 September 2013).
- 99** Ibid.
- 100** David Pugliese, “Photos: VBCI being used in Mali,” 17 February 2013, available at <http://blogs.ottawacitizen.com/2013/02/17/photos-vbci-being-used-in-mali/> (accessed 6 September 2013).
- 101** Army-Technology.com, “VBCI Wheeled Infantry Fighting Vehicle, France” available at <http://www.army-technology.com/projects/vbci/> (accessed 6 September 2013).
- 102** Canadian American Strategic Review, “Background — Close Combat Vehicle — GDLS-Canada Piranha 5 IFV,” available at <http://www.casr.ca/bg-army-ccv-piranha5.htm> (accessed 6 September 2013).
- 103** General Dynamics European Land Systems, “Wheeled Vehicles: Piranha,” September 2011, available at http://www.gdels.com/esp/brochures/wheeled_piranha.pdf (accessed 6 September 2013).
- 104** Canadian American Strategic Review, “Background — Close Combat Vehicle — GDLS-Canada Piranha 5 IFV.”
- 105** Canadian American Strategic Review, “Background — Close Combat Vehicle — BAE Hägglunds CV9035 MkIII,” available at <http://www.casr.ca/bg-army-ccv-CV9035.htm>
- 106** BAE Hägglunds, “CV9035 DK: Armoured Fighting Vehicle,” 2007, available at http://www.forsvaret.dk/fmt/documents/fmt/lokale%20resurser/projekter%20h%C3%A6r/infanterikampk%C3%B8ret%C3%B8jer/default/faktaikk_f9a343f5-6a7d-4abd-baze-182a7cc492b5.pdf
- 107** Singapore Ministry of Defence, “Swedish Versatility,” November 2007, available at http://www.mindef.gov.sg/imindef/publications/cyberpioneer/weapon/2007/nov07_weapon.html (accessed 6 September 2013).
- 108** Headquarters of the Department of the Army, “Counterinsurgency,” December 2006, available at <http://www.fas.org/irp/doddir/army/fm3-24.pdf> (accessed 6 September 2013).
- 109** Ibid., 5–1.
- 110** Lee Berthiaume, “Canadian military lost 34 vehicles in Afghanistan, 359 damaged” 19 July 2012 available at <http://o.canada.com/2012/07/19/78433/> (accessed 6 September 2013).
- 111** Canadian American Strategic Review, “Background — ‘LAV UP’ — the GDLS-CLAV III Upgrade Project,” 10 November 2012, available at <http://www.casr.ca/bg-army-armor-lav-upgrade.htm> (accessed 6 September 2013).
- 112** General Dynamics Land Systems, “LAV UP,” available at <http://www.gdlsCanada.com/index.php/products/light-armoured-vehicles-lav/lav-up> (accessed 6 September 2013).

113 Ibid.

114 Ibid.

115 IHS Janes, “LAV toughens up,” 14 June 2012, available at <http://www.ihs.com/events/exhibitions/eurosatory-2012/news/jun-14/english/LAV-toughens-up.aspx>

116 General Dynamics Land Systems, “LAV UP.”

117 David Rutkay, “DHV: Canadian Army next-generation armoured vehicles,” 31 May 2012, available at <http://www.army-technology.com/features/featuredssi-dvh-LAV-III-canadian-army>

118 Canadian American Strategic Review, “Background – Close Combat Vehicle – GDLS-Canada Piranha 5 IFV,” 28 September 2011, available at <http://www.casr.ca/bg-army-ccv-piranha5.htm>

119 Canadian American Strategic Review, “Background – Close Combat Vehicle – BAE Hägglunds CV9035 MkIII,” 26 September 2011, available at <http://www.casr.ca/bg-army-ccv-cv9035.htm>

120 General Dynamics Land Systems, “LAV UP.”

121 Ibid.

122 Peter Gizewski and Lieutenant-Colonel Mike Rostek, “Towards JIMP Capable Land Force,” in *Towards Land Operations 2021: Studies in Support of the Army of Tomorrow – Force Employment Concept*, Department of National Defence, edited by Major Andrew B. Godefroy and Mr. Peter Gizewski, 2009, p. 4–1, available at http://publications.gc.ca/collections/collection_2011/dn-nd/D2-188-1-2009-eng.pdf (accessed 6 September 2013).

123 Peter Gizewski, “The Future of Security Environment,” in *Towards Land Operations 2021: Studies in Support of the Army of Tomorrow – Force Employment Concept*, Department of National Defence, edited by Major Andrew B. Godefroy and Mr. Peter Gizewski, 2009, p. 1–23 available at http://publications.gc.ca/collections/collection_2011/dn-nd/D2-188-1-2009-eng.pdf (accessed 6 September 2013).

124 Department of National Defence, “News Release - Minister Fantino highlights support for Canadian Army and Canadian Workers,” 8 June 2012, available at <http://www.forces.gc.ca/en/news/article.page?doc=minister-fantino-highlights-support-for-canadian-army-and-canadian-workers/hgq87xso> (accessed 6 September 2013).

125 Army-Guide.com, “LAV-25 Coyote,” available at <http://www.army-guide.com/eng/product933.html> (accessed 6 September 2013).

126 Office of the Auditor General, “Chapter 5: Acquiring Vehicles for Use in Afghanistan,” p. 19.

127 CBC News, “In depth: Afghanistan Canada’s equipment,” 18 September 2006, available at <http://www.cbc.ca/news/background/afghanistan/cdnequipment.html#gwagon> (accessed 6 September 2013).

128 Chief Review Services, “Internal Audit: Tactical Armoured Patrol Vehicle (TAPV),” November 2011, p. 3, available at <http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/2011/P0951-eng.pdf> (accessed 6 September 2013).

129 Canadian American Strategic Review, “TAPV: Contract Award for the Tactical Armoured Patrol Vehicle,” June 2012, available at <http://www.casr.ca/doc-dnd-tapv-award.htm> (accessed 6 September 2013).

130 Chief Review Services, “Internal Audit: Tactical Armoured Patrol Vehicle (TAPV),” p. 3.

131 Department of National Defence, “News Release – Minister Fantino highlights support for Canadian Army and Canadian Workers.”

- 132** CanadianSoldiers.com, “TOW Missile,” 25 August 2013, available at <http://www.canadiansoldiers.com/weapons/ordnance/tow.htm> (accessed 6 September 2013).
- 133** CanadianForcesMilitary.com, “TOW,” available at <http://canadianforcesmilitary.com/?s=tow> (accessed 6 September 2013).
- 134** Nathan Hodge, “General Dynamics Wins Upgraded LAV III Contract From Canada,” 24 August 2004, available at <http://www.defensedaily.com/articles/dt/2004/dt08240403.htm> (accessed 6 September 2013).
- 135** Ibid.
- 136** David Pugliese, “Canadian Army studies its direct fire capability as its gets ready to divest itself of some TOW systems,” *Ottawa Citizen*, 28 May 2012, available at <http://blogs.ottawacitizen.com/2012/05/28/canadian-army-studies-its-direct-fire-capability-as-it-gets-ready-to-divest-itself-of-some-tow-systems/> (accessed 6 September 2013).
- 137** Ibid.
- 138** Canadian American Strategic Review, “Background — CF Multi-Mission Effects Vehicle (MMEV) Project,” 10 September 2010, available at <http://www.casr.ca/bg-lav-mmev-project.htm> (accessed 6 September 2013).
- 139** Ottawa Citizen, “Army backtracks on plan to ditch armoured tanks,” 9 July 2006, available at <http://www.canada.com/ottawacitizen/news/story.html?id=f103c834-10c6-4e79-971b-1e6ab894ef34> (accessed 6 September 2013).
- 140** Deagel.com, “MMEV,” 18 August 2013, available at http://www.deagel.com/Air-Defense-Systems/MMEV_a000316002.aspx (accessed 6 September 2013).
- 141** David Pugliese, “Army tried to scuttle combat vehicle purchase amid deep cuts,” 21 May 2013, available at <http://www.ottawacitizen.com/business/Army+tried+scuttle+combat+vehicle+purchase+amid+deep+cuts/8416041/story.html> (accessed 6 September 2013).
- 142** Ibid.
- 143** Standing Senate Committee on National Security and Defence, “Proceedings of the Standing Senate Committee on National Security and Defence: Issue 11 — Evidence — Meeting of December 3, 2012,” available at <http://www.parl.gc.ca/content/sen/committee/411/SECD/11EV-49878-E.HTM> (accessed 6 September 2013).
- 144** Ibid.
- 145** David Pugliese, “Army tried to scuttle combat vehicle purchase amid deep cuts.”
- 146** Lee Berthiaume, “Harper government’s defence spending cuts raise spectre of another ‘decade of darkness,’” *National Post*, 20 March 2013, available at <http://news.nationalpost.com/2013/03/20/harper-governments-defence-spending-cuts-raise-spectre-of-another-decade-of-darkness> (accessed 6 September 2013).



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