

Rob Engen, University of Calgary

Military Operations in Urban Terrain – Ramifications for Canadian Defence Policy

Rob is a student at the University of Calgary, currently working toward a degree in Honours History. His academic concentration is in military affairs, and he acquired a distinct personal interest in urban operations when he worked security in downtown Calgary during the 2002 G8 Summit. Over this past summer he married a beautiful woman of enormous patience and wisdom, and owes much to his bride in the way of this symposium paper and his preparations to fly across the country to present it. He enjoys writing more than he has any right

to, and has, on occasion, been accused of analysis.

Abstract

Current trends in military affairs are indicating a shift in the post-Cold War world toward forms of asymmetrical warfare. The overwhelming concentration of conventional military power in the United States (and, to a lesser extent, its allies) consequently means that future adversaries will likely pursue non-traditional strategies when confronting Western armies in order to achieve an otherwise unattainable strategic parity. An acknowledged method of achieving this equalization is through conducting military operations in cities, towns, and other densely-populated urban environments. Urban terrain restricts the tactical flexibility

of armoured vehicles, hampers the exercise of air power, and forces belligerents into close-combat fighting, while generally serving as a force multiplier for defenders. Moreover, they present a confused and restrained operating environment due to heavily built-up areas and the presence of civilian non-combatants, both necessitating strict Rules of Engagement. As has been demonstrated twice by the Russian army in the streets of Grozny, conducting urban military operations with an inadequately-trained and prepared force is certain to result in disproportionately heavy casualties.

As Canada continues its participation in United Nations and other allied operations, it will be confronted with the realities of urban warfare as an asymmetrical strategy. This paper contends that in order for Canada to maintain the efficacy of its expeditionary forces abroad and its civil defence capabilities at home, strategic emphasis must be placed on the conduct of urban military operations. This necessity is underlined by Canada's continued participation in United Nations-sponsored peacekeeping and peace-enforcement operations, particularly in impoverished regions undergoing heavy urbanization – no matter where they are deployed and for what purpose the Canadian Forces can expect to conduct future operations in urban areas. In the wake of the disbanding of Canada's elite Airborne Regiment in 1995, which was tasked with special-purpose operations including urban warfare, Canada's current operational readiness for urban activities needs to be assessed. This paper suggests several avenues that the Canadian Forces could pursue toward creating an urban-operations-capable doctrine, including training in Canadian city centres, a new emphasis on technological implementation on the level of the individual soldier, and overseas interoperability with NATO and other allied forces.

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Rob Engen

Making war in an urban environment is not a new idea. The tendency toward vast destruction and mass casualties in built-up areas is enshrined in the mythology of the Second World War in battles such as Stalingrad, Ortona, and Berlin. The lesson drawn in the post-war period from these vicious battles has been to try and *avoid* conducting urban military operations altogether. But the nature of the world since even before the end of the Cold War ensures that there will be no avoiding such confrontations. There are two reasons for this. First, current trends in military affairs are strongly indicating a shift toward forms of asymmetric warfare: strategies undertaken to apply one's strength to an enemy's weakness, knowing that a traditional strength-on-strength approach would mean defeat.^[1] A projected trend is that urban warfare will be increasingly and deliberately employed as an asymmetrical strategy against Western nations such as Canada and its allies. Fighting in built-up areas inherently favours the defender and, moreover, can undermine or negate many of the strengths of Western armies. Second, the continuing process of mass global urbanisation – particularly visible in troubled Third World countries – means that, statistically, cities will increasingly become centres of gravity for conflicts of all varieties. But what makes urban warfare an integral part of the new threat environment is that it can no longer be approached in a straightforward tactical manner - there now exists a whole new dimension of political considerations that affect attitudes toward friendly casualties, civilian non-combatant casualties, and collateral damage. Even more importantly, many groups or nations will recognise this and seek to invite battle in their own urban environments in order to place intolerable political constraints on Western armed forces.

The Canadian Forces have a unique stake in these affairs, as many of the threats that they will be called upon to engage in the near future will inevitably be contained within the physical context of a built-up urban area. Peace support missions and more conventional Canadian military expeditions alike will increasingly be faced with this new threat environment, and in all likelihood the rules of engagement (ROE) for conducting operations on urbanised terrain will grow no less stringent in the future. For this reason, it is necessary to critically assess both the nature of urban warfare and the Canadian Forces' - especially the Land Forces' - operational readiness for properly approaching this dangerous asymmetric threat. As a result of this investigation, it is the position of this paper that with sufficient material and practical development, the Canadian Land Forces *could* represent the model of an efficient urban warfare-capable army in the modern world.

In order to ascertain some estimate of Canada's urban warfare capabilities, first the nature of modern urban operations must be addressed. The most expedient way to do this is through dividing discussing the tactical and political-strategic threats of urban warfare separately. This will be followed by a more thorough look at the Canadian Forces' capacity for conducting this type of war. As investigating the latter topic – the ramifications for Canada's defence – is the primary undertaking of this paper, only a cursory look will be given to the

nature of urban warfare. This will not be an in-depth analysis of military operations in urban terrain, for that is beyond the scope of this paper to fully and properly address. Nonetheless, if Canada's capabilities in this domain are to be properly assessed an understanding of the fundamental threats and problems surrounding the subject is an absolute necessity.

The Tactical Threat of Urban Warfare

The urban environment presents a unique operating environment for any military force, primarily due to *density*. The density of urban terrain is three-tiered: 1) density of physical construction; 2) density of surrounding infrastructure; 3) density of the local non-combatant population.^[2] These create a tactically and politically constricted operating environment; a harsh counterpoint to open-field manoeuvre warfare.

Tactically speaking, the urban threat environment is one of the most imposing in which soldiers can operate. The terrain is composed of densely packed structures divided and subdivided by road and infrastructure networks that may or may not be arranged in a logical, comprehensible manner. The best that can be hoped for in such an environment is the non-linear but straightforward planned urban layout found in (some) Western cities; given the proliferation of Third World shanty towns and general global urbanisation, however, a confused and labyrinthine urban operating environment is increasingly likely.^[3] Potential structural damage and resulting debris further serves to complicate the environment. There is also the three-dimensional nature of the terrain that bears serious consideration. Tall buildings present a serious tactical impediment to operations on several levels. They act as natural centres of resistance for defenders, and can make excellent positions for snipers. They are also less vulnerable to direct heavy weapons fire from the ground: the turret on a modern main battle tank rarely has an gun elevation of more than +20°, which is inadequate for reaching the upper stories of tall structures.^[4] Further, air-launched precision-guided munitions have not yet reached a level of technological excellence in which they can destroy a target in a high-rise building without causing prohibitive collateral damage.^[5] Buildings must, then, traditionally be both physically levelled and destroyed or stormed by dismounted infantry units, who can expect high casualties in room-to-room combat.

There is also the civilian non-combatant population that needs to factor into every military assessment. In a best-case scenario civilians are friendly or indifferent to a Western force, but still hamper military operations by their very presence in the dense urban environment. In a worst-case scenario, they will actively support enemy troops, helping them blend into a crowd or sometimes even aiding them in battle as human shields or as spotters, as happened during the 1993 American mission in Mogadishu, Somalia.^[6] A dense civilian population can also make for mass civilian casualties, accidental or otherwise, the political ramifications of which are discussed later. Gaining the support of the general populace is crucial to successful urban operations, but circumstances dictate that is not always possible.

Therefore, this unstable factor must be approached with caution.

Other limiting aspects need to be considered, as this complex environment is not only more hazardous, but also tends to undermine traditional Western military technical strengths. Armoured vehicles have difficulty operating in urbanised terrain. Aside from the limited elevation of tank guns discussed earlier, dense urban construction places physical restrictions on manoeuvre, which limits armour's tactical flexibility and turret traverse. Roadblocks become an increasing danger, and the proliferation of shaped-charge rocket-propelled grenades (especially the Russian RPG-7) and other short-range anti-tank weapons make armoured vehicles – especially heavy main battle tanks – vulnerable to the close-quarters attacks of urban warfare.^[7] As an instructive example of the vulnerability of armour in an urban centre, during the December 31st, 1994 advance into Grozny, Chechnya, Russian armoured vehicles deployed into the Chechen capital without dismounted infantry screening them. The Chechens subsequently ambushed, cut off, and systematically destroyed the Russian armoured units in the spearhead; of the Russian 131st Motorized Brigade, only 18 out of 120 vehicles survived the initial advance into the city.^[8]

The urban environment also seriously undermines air power, another traditional Western strength, to an even greater extent. While fixed-wing aircraft can operate high above an urban centre, any supporting attacks they launch will invariably result in excessive collateral damage, and likely a higher rate of fratricide. Rotary aircraft such as helicopters have more utility but are tremendously vulnerable to many of the same weapons that armoured vehicles are, and have very real survivability issues since they typically fly low and fairly slowly.^[9] The downing of American Black Hawk helicopters in Somalia is indicative of what one can expect from employing these aircraft in a dense urban setting.^[10] While helicopters add flexibility to infantry operations and allow for effective top-down deployments in tall buildings, they simultaneously make inviting and vulnerable targets, and even relatively low-tech rocket-propelled grenades are capable of inflicting serious damage upon them. Taking this into consideration, air power is, on the whole, of limited utility in the tactical conduct of urban military operations – a fact that seriously undermines this traditional Western combat strength.

There are many other tactical considerations that make the urban operating environment unique. Communications problems in urban terrain are severe as a result of power constraints on man-portable radios, fading, and path loss, all of which are accentuated by built-up areas.^[11] The nature of street-to-street fighting necessitates a decentralised structure favouring smaller units, which can frustrate traditional command and control efforts. Large units cannot physically operate in formation on urbanised terrain without running the risk of enemy ambush and entrapment, as happened in Grozny.^[12] Closely-set buildings and underground sewers or transit systems can allow for movement that is entirely undetected by an opposing force even at close range. As a result, accurate intelligence is both critical and proportionately difficult to obtain. In sum, urban terrain, even under the best circumstances, is

a tactical nightmare for soldiers.

The Political-Strategic Threat of Urban Warfare

Even more critical in the modern day, however, are the political and strategic constraints of military operations in urban areas. The proliferation of mass media and the subsequent public consciousness of military activities has its greatest impact in the area of how armed forces conduct urban operations. In the Canadian political sphere there has been visibly emerging since the early 1990s a zero-tolerance policy for friendly or neutral casualties or collateral damage.^[13] Casualties among troops or casualties among non-combatants caught in the crossfire can quickly turn public opinion against a military expedition, and, at its worst, force a withdrawal from the theatre of operations. The American experience in Mogadishu, Somalia in 1993 is a case in point. An unfortunate task force including Army Rangers and the elite counter-terrorist Delta Force was trapped in the slum streets of Mogadishu, pinned down by enemy fire. The Americans suffered 18 dead and some 73 wounded over the course of the night. The fact that they inflicted over 1,000 enemy casualties was overlooked; Mogadishu was portrayed as a military disaster and the American presence in Somalia was rapidly phased out by the Clinton administration.^[14] While this experience is not representative of urban warfare in general, the delicate political strings attached are obvious. Images of dead friendly soldiers or children on CNN are unpopular and tend to have a profoundly negative impact on support for a military venture; live television coverage of wars since the Gulf War has made the public more sensitive to combat losses and peripheral civilian losses.^[15] As a result, Western nations are seeking ways to minimise collateral damage to the civilian population of any area in which they are conducting operations. In built-up areas, where the density of the non-combatant population is so much higher than anywhere else, these political imperatives and restraints are reflected in the veritable straitjacket of rules of engagement that are placed upon troops.

Indirect fire, for example, cannot be brought to bear on a city without considerable political backlash. While shelling Grozny under a creeping barrage of artillery fire worked for the Russians in Chechnya, Canada and its alignment partners are faced with a moral imperative that does not generally include systematically raining high explosive shells on a civilian population from over the horizon.^[16] This is also the fundamental problem with employing airpower in an urban setting. As mentioned earlier, studies have determined that even the best precision-guided munitions currently available cannot prevent collateral damage or civilian bystander deaths. Despite strict rules of engagement there were an estimated 30 instances in Operation Allied Force in 1999 wherein non-mission targets were inadvertently struck as a result of either, "errant NATO munitions or mistakes in targeting."^[17] The most consequential incident was the bombing of the Chinese embassy in Belgrade on May 7.^[18] Tactical errors of this nature can have profound strategic consequences in an urban environment. As a direct

result of incidents of this kind, ROE are (and will continue to be) stringent when operating in areas where the probability of civilian casualties, excessive collateral damage, or more likely both, are highly probable. There is always a temptation to relax rules of engagement as a result of increased friendly casualties, and an equally strong temptation to fortify them due to publicised civilian casualties.^[19] Either way, a significant danger to national morale is presented.

This demonstrates why urban terrain qualifies as a *new* threat environment: soldiers are now placed in a high-risk operational situation and are either *not able* or *not authorised* to employ every expedient method to ensure their own safety and/or achieve their objectives. Consequently, urban operations conducted with the necessarily strict Rules of Engagement offer disproportionate risks to the soldiers involved - risks that, if pursued, could translate into unacceptably high casualty rates.

As mentioned before, it is as much the political expediency as it is the tactical advantage that may tempt future actors to pursue battle in urban centres as an asymmetric strategy. Highly-publicised peripheral events such as the NATO bombing of the Chinese Embassy can work toward defeating support for a war effort, while the tactical problems of fighting in built-up areas, accentuated by ROE *caveats*, confound operations themselves. But as military analyst James Dunnigan has put it: "Most of the likely battlefields for Americans are built-up areas...but since the Gulf War, American losses have become a no-no." As a result, "the word is out: take those cities without generating a lot of American body bags."^[20] Accomplishing this, however, will present a major obstacle for military planning.

How will this affect Canada?

The difficulties of urban warfare have direct ramifications on the deployment of the Canadian Forces abroad, as they will on all expeditionary nations in the Western world. Even if no hostile power ever attempts to knowingly capitalise on the asymmetric advantages of urban warfare, the rapid pace of global urbanisation makes it increasingly probable, statistically, that Canadian Forces operating overseas or domestically will have to conduct military operations in an urban threat environment. As cities are natural centres of gravity and tend to house the most important administrative, industrial, and military functions of a nation-state, as well as the majority of a population, they will be the focus of conflict of all kinds. As General Charles Krulak of the United States Marine Corps stated in defining the core ethos for urban operations:

"In one moment in time, our service members will be feeding and clothing displaced refugees – providing humanitarian assistance. In the next moment, they will be holding two warring tribes apart – conducting peacekeeping operations. Finally, they will be fighting a highly lethal mid-intensity battle.

All on the same day, all within three city blocks.”[\[21\]](#)

Such broad, complex, and sometimes contradictory mission parameters will not be the responsibility of the United States alone. Canada, with its extensive peace support commitments abroad, needs to be appreciative of and attentive to this trend.

It might be argued that peace support operations of the sort that the Forces have undertaken are somewhat detached from the concerns of conventional military matters, and that the new threat environment of urban warfare is not applicable to peacekeeping. This, however, is dangerous thinking. In conventional conflicts there may still be alternatives to becoming entangled in urban warfare; the options of avoiding, sealing-off, or simply bypassing urban centres may be available, depending on campaign objectives. Peace support operations, however, are not concerned with achieving goals synonymous to those of conventional military operations. They are fielded to restore peace, stability, and safety to a region, which necessitates a sustained, visible presence in a conflict area.[\[22\]](#) The conflict area can thus not be avoided as a strategic expedient, even if it is more convenient or safer to do so. A peacekeeping mission, particularly one fielded for dangerous-but-vital interposition duties, is necessarily going to have to place soldiers in conflict areas as a “buffer” force.[\[23\]](#) Independent British and Canadian studies have indicated that between 70-90% of peace support soldiers in certain Bosnian missions between 1992-95 sustained direct threats such as weapons fire, mortar shelling, or sniper activity.[\[24\]](#) Peacekeepers must be fully prepared to deal with conflict situations in which they find themselves involved. Given the rampant urbanisation of the Third World these conflicts will increasingly be located in urban centres; if Canadian peace support troops are not trained and adequately prepared for the contingency of combat in a built-up environment, then casualties will be disproportionately high. Urban warfare represents the worst kind of attrition for armies that are not prepared for it.

Consequently, it is becoming increasingly deceptive to view urban warfare as a *scenario*, another “special” environment needing to be addressed as a footnote to – or entirely separated from – broader military operations. As will be discussed, Canadian tactical doctrine currently approaches fighting in built-up areas in this inadequate manner. Given the proliferation of instances of urban warfare and the compounding value of urban population centres as strategic, economic, and political centres of gravity, one can expect that most (although by no means all) future conflicts will involve fighting in the streets as an important operational component. Assuming this trend will continue, it is not beyond reason to imagine that eventually *urban warfare* will become synonymous with *warfare*, a norm rather than an exception. In Grozny the Chechen rebels, aware of their inability to defeat the Russian Army in the field, adopted a strategy of battling for “successive cities,” moving the battle of urban attrition from one strongpoint to the next throughout the countryside.[\[25\]](#) It would not be exaggerating to assume that strategies such as this are what the Canadian military establishment can expect to confront in the near future. Of the last 250 U.S. Marine Corps overseas deployments, 237 have involved urban operations; warfare is already gravitating

toward cities, an urbanisation of the operational mandate for armed forces.[\[26\]](#) Current military practices, planning, procedures, and tactics need to begin to account for the fact that individual officers and soldiers will require a thorough understanding of the urban environment as a fundamental part of normal combat skills. While all-around training is generally applicable to most situations, conducting military operations in modern cityscapes is tremendously demanding and requires special training.

In Chechnya, the rebels were well prepared for the ensuing urban fighting, while the Russians had been allowing their urban operations capabilities to slip since the 1980s in favour of the open-field manoeuvre warfare they believed they would have to fight against NATO.[\[27\]](#) Relevant Russian training and procedures were utterly inadequate, as demonstrated by the first disastrous entry into Grozny on New Year's Eve 1994. If no other lesson should be taken from this context, it is that an ill-prepared force will be massacred in an urban environment. Canada, as an expeditionary power, needs to take careful note.

Assessment of Canada's Military Capabilities in Urban Terrain

The issue at hand is whether the Canadian Forces and Canada's defence policies are adequate in facing the challenges that are presented by conducting military operations in urban terrain. Such a discussion must cover several aspects of the Canadian military: (1) Doctrine; (2) Defence Policy Orientation; (3) Equipment; and (4) Training. Doctrine, as the Canadian Forces understand it, is defined in Canadian Forces Publication B-GL-300-001/FP-000 *The Conduct of Land Operations – Operational Level Doctrine for the Canadian Army*. It states:

Military doctrine is a formal expression of military knowledge and thought, that an army accepts as being relevant at a given time, which covers the nature of conflict, the preparation of the army for conflict, and the method of engaging in conflict to achieve success.[\[28\]](#)

Canadian doctrine is focused around the abstract idea of "manoeuvrist warfare," which, "strikes a balance between the use of physical destruction and moral coercion, emphasising the importance of the latter, to attack the enemy's will." This is accomplished through a succession of rapid, violent, and unexpected attacks that make for the quick and decisive defeat of an enemy by paralysing his command and control ability.[\[29\]](#) This is a highly abstract approach, and its applicability for the Canadian Forces has been hotly debated.[\[30\]](#) Unfortunately, it offers little in the way of conceptualising urban warfare as a new threat environment for Canadian troops or for offering practical methods for coping with it. Publication B-GL-300-001, which propounds operational and strategic doctrine, contains no real preparation for meeting

the unique challenges presented by urban terrain aside from “Use of Force Guidelines” that outline the basis for rules of engagement.^[31] Publication B-GL-300-002, *Land Force Tactical Doctrine*, contains a scant six pages on fighting in built-up areas as an operation in a specific environment.^[32] While this does contain valuable, researched information, it has a number of tactical shortcomings and oversights; it is also not comprehensive enough to act as a reasonable basis for conducting military operations in urban terrain. It promotes the extensive use of helicopters (a dangerous proposition for the Canadian military no matter which way you look at it) in the urban theatre without mention of their acknowledged vulnerabilities in such situations.^[33] There is waffling on the proper employment of armour in fighting in built-up areas, and contradictions in the text on whether or not tanks and armoured vehicles have a significant place in the urban fight. There is also a general failure to acknowledge the extreme difficulties in regulating communications during the urban fight, which is surprising considering the Canadian Army’s struggle with modern communications equipment in the past.^[34] While the *Land Force Tactical Doctrine* possesses useful qualities, its approach to urban warfare is more reminiscent of a summary review rather than a practical methodology meant to harmonise military thinking.

However, other documents do exist that supplement this. The Army Lessons Learned Centre has an excellent compilation of urban warfare knowledge in the form of its *Training for Urban Operations* publication.^[35] Although hardly exhaustive and hardly a tactical instruction manual, it contains numerous relevant case studies and astute observations on the nature of the urban fight. A draft apparently also exists of *A Soldier’s Guide to Fighting in Built-up Areas*,^[36] a more thorough tactical handbook for urban operations. Additionally, the Army Lessons Learned Centre identified another CTC interim doctrine publication, *FIBUA*; while this was a “useful document,” it was also a cut-and-paste of American urban operations manuals, and “has neither diagrams, nor lesson plans nor any real Canadian doctrine, and should be viewed as a work in progress.”^[37] Given the fairly comprehensive state of American military planning for operations in urban terrain, this would have been a practical interim measure for providing Canadian soldiers with effective doctrine. However, a home-grown “Canadian” approach to urban warfare is a necessity. As Lt.-Colonel Ian Hope of the Canadian Forces points out in an article on Canadian operational doctrine, “A new written doctrine for the Canadian Army must come from Canadian pens.”^[38]

So while Canadian doctrine on fighting in built-up areas does exist, it is in many ways inadequate for the task. Urban warfare is viewed as a scenario independent of others types of operations rather than as a greater reality on the modern battlefield. The Canadian Army has demonstrated a willingness to address the problem of fighting in urban centres, even if its most relevant documents are training dispatches, drafts, and cannibalised foreign doctrine. When constructing true Canadian doctrine on urban terrain, its reality not just as an operating environment but as *the* likely operating environment for all Canadian deployments abroad needs proper attention.

Canadian defence policy orientation, on the other hand, shows promise for building an urban warfare-capable army. As dismounted infantry is going to be performing the brunt of any fighting, an army's success in urban warfare will be measured by the priority and fighting edge given to their infantrymen. Canada is ahead of this trend: in May of 2002 the Canadian Army entered into a 10-year restructuring plan, reducing the readiness of armour and artillery regiments while increasing the capabilities of Canada's Light Infantry Battalions (LIBs). The major changes include developing the LIBs to achieve a potential special-operations capability similar to that found in the U.S. Army's 75th Ranger Regiment.^[39] These capabilities will include a focus on countering asymmetric threats such as urban warfare. The current Army Strategy calls for a, "medium-weight, information-age army," by 2012; medium-weight force in this context means exploiting technology, strategic responsiveness, and tactical and operational agility to replace the mass of heavy-weight forces.^[40] In regards to operations in urban terrain, this is close to ideal; heavy forces tend to do poorly in cities when harnessed with strict rules of engagement, as any Canadian force can expect to be. Medium-weight forces can expect to effect more controlled firepower^[41] while enjoying greater speed and flexibility. While these changes will take time to implement, the Army Strategy as stated is a sound one for evolving the Canadian Forces toward heightened capabilities while conducting warfare in the urban threat environment.

The infantry equipment fielded by the Canadian Forces also demands assessment in its applicability to urban warfare. While the urban warfare technologies employed in the 1990s did not differ significantly from those employed in 1982,^[42] there is growing evidence that technology and superior equipment will play an increasingly central role in combat in built-up areas.^[43] On the whole, the equipment and vehicles currently employed by the Canadian Forces meets many of the demands for urban warfare, though there remains much room for improvement. For the infantry, the Canadian C7 build of the M-16 assault rifle is a superior weapon to its parent, possessing a longer barrel life and reportedly performing better in mud and the poor operating conditions typically found in urban environments.^[44] The C7's manufacturer, Diemaco Ltd., offers numerous variants on the base weapon platform, including a shorter C8 carbine rifle and an impressive Special-Forces Weapon (SFW) rebuild, and the 40mm M-203A1 Grenade Launcher attachment any weapon of the C7 'family'.^[45] The M-203A1 removable attachment is particularly well suited for use in the dangerous environment of a built-up area. Night-vision equipment is essential: in Grozny, Chechen "ghost" snipers harried Russian troops by night, making it impossible for the Russians to retaliate and thereby greatly affecting morale.^[46] While the Canadian Army's night-vision equipment is ageing (the AN/PVS-504 goggles were brought into service in 1987) they are still standard-issue, in small quantities, to troops.^[47] Canada also has access to impressive infantry weapon sighting systems such as the SureFire Weapon Mounted Light and the CLAM, as well as laser range-finders, even if this equipment has not been made standard-issue for the Army.^[48] These systems would be an asset in the close-quarters fighting necessitated by urban operations; if higher levels of equipment funding can be attained, investing in making these sighting systems

standard-issue would be expedient.

In terms of vehicles and armoured support, the Canadian Forces are well equipped for overcoming the difficulties presented by modern urban warfare. Constrained by moral and political factors from making use of indirect artillery fire, and warned in its own *Land Force Tactical Doctrine* against using tanks as fire support,^[49] the Canadian Army needs flexible, armoured fire-support vehicles that will provide less, but more precise, firepower. As it stands, the Canadian Army maintains an adequate fleet of such vehicles, particularly its LAV-25 III Light Armoured Vehicle and the variants thereof, such as the Coyote reconnaissance vehicle. These vehicles are much better-suited for low- and mid-intensity operations in urban areas than tanks. Their turrets are smaller and better able to traverse in enclosed city streets, while the main gun (a 25mm chain gun on a Coyote) has an elevation range of -10° to +60°.^[50] They can therefore target the upper floors of tall buildings with greater ease and greater precision than main battle tanks, and are less likely to cause excessive collateral damage in the process. The Coyote, as a light armoured reconnaissance vehicle, is a particularly valuable asset and, as Canadian Major R.T. Steward said, “The Coyote...places Canada in the unfamiliar position of having other armies admire us for our equipment.”^[51] Its speed, firepower and advanced sensor suite will be of great use while operating in a city. Furthermore, the LAV design, produced in Canada, is also highly modifiable and can be re-engineered to fit specific mission parameters; Saudi Arabia fields a variant that mounts a 90mm assault gun, while the U.S. Marine Corps has an air defence version that includes Stinger SAMs.^[52] This can allow individual vehicles to be modified to provide heavier firepower on an as-needed basis. While re-engineering existing vehicles can be expensive, Canada has been known to do so, as it still remains less costly than purchasing new equipment. Given that almost all built-up areas have paved (or at least solid) road networks running through them, wheeled armoured vehicles such as the LAV will be able to operate faster and with less wear than tracked vehicles. Although the *caveat* remains that vehicles must be protected at all times by dismounted infantry, the Canadian Army’s current selection of support vehicles would appear to be an effective nucleus around which to build a successful urban warfare operation.

Training, perhaps more than any other relevant factor, is the true key to winning in built-up areas. As popular military novelist Tom Clancy noted in his examination of the U.S. Marine Corps, military operations in urban terrain, “can tear the guts out of an infantry force if it is not extremely well trained and very methodical.”^[53] As it currently stands, the Canadian Army is not fully or properly trained for such operations. In an article in *The Army Doctrine and Training Bulletin* Brigadier-General Glenn Nordick commented on how his areas of operational experience, such as Cyprus and Croatia, bore little resemblance to the training areas at Gagetown, Wainwright, or Suffield. Instead, “the terrain has almost inevitably been complex, consisting of large cities, or smaller, almost mutually supporting towns and villages.”^[54] The Canadian Army doctrine provides little assistance, offering non-specific advice on theatre and mission-specific training (TMST) and deference to commanders to mete out proper rules of engagement.^[55] However, this must be tempered by the knowledge that progress is being

made, especially in practical training exercises. In the spring of 2001 a massive training exercise called URBAN RAM took place at the old Griesbach Barracks in Edmonton. The exercise was an admission that, "The Army has a vital requirement to be trained in urban warfare, as Canadian Forces deployments must often take place in urban settings. Routine activities in Peace Support Operations...can escalate into situations similar to those practiced during Exercise URBAN RAM." [56] The entire 1 Canadian Mechanised Brigade Group was rotated one unit at a time through the empty barracks, which had been transformed into an urban warfare simulation course. This was a good training concept. While the Canadian Army has been broadly attacked for a failure to implement training exercises on the brigade-level, [57] something they have been attempting to atone for in recent years, urban warfare is *not* something that needs to be simulated on the brigade level to be most effective. The physical barriers inherent to urban warfare force a decentralisation of command; while a brigade-level force may be deployed to an urban area, the most meaningful co-ordination is going to come at the company (sub-unit) level. General Nordick, in commenting extensively on URBAN RAM, agrees with this assessment: "As a result of the (URBAN RAM) experience...we need to recognise that FIBUA (Fighting-In-Built-Up-Areas) training is best delivered at the company level." [58] The state of training at the individual and sub-unit levels in the Canadian Army is reasonably good, and these organisational levels have the most pressing need exists in relation to urban warfare. [59]

What Canada *lacks* is an effective urban warfare training centre such as those which exist in the United States. URBAN RAM fortuitously coincided with the physical close of the Griesbach Barracks in Edmonton, allowing for an opportune – but temporary – experience. But Canada's traditional approach to urban operations training has been the establishment of a couple of concrete buildings in an isolated area of the base. [60] This has not allowed for training beyond the section level, and has not allowed for the development of anything but the most rudimentary tactics. Furthermore, while there exists an "imperative requirement" for force-on-force training to simulate the close-combat environment of built-up areas, as of 2001 Canadian regulations did not permit force-on-force exercises to routinely take place in an urban setting. [61] This is a problem that needs to be resolved, as training for combat in an urban environment requires going beyond the theoretical trappings of combat.

Conclusion and Recommendations – The Future Shows Promise

There have been excellent discussions on the overall operational readiness of the Canadian Forces that it is beyond the scope of this paper to address. What is relevant is, on the balance, whether or not the Forces are capable of conducting and sustaining meaningful urban operations domestically and abroad. It is the conclusion of this paper that, despite cobbled doctrinal publications and a limited capacity for urban operations training at existing facilities, the Canadian Land Forces will be effectively prepared to undertake high- or mid-intensity

military operations in urban terrain, provided that these issues can be addressed.

That said, the future shows promise. Canadian defence planners, in policies such as *The Army Strategy* and *Defence Strategy 2020*, have demonstrated a strategic vision for the Canadian Army that is highly compatible with a capability for mounting effective urban operations.^[62] Defence policy, if followed and implemented in coming years, will create a mobile, information-age combat force that will be operationally and tactically effective in urban areas. The decision to retain the Light Infantry Battalions was a wise one, as these units will, with proper training and doctrine, become the mainstay of the Canadian Forces' capacity for fighting in built-up areas.^[63] The equipment currently fielded by the army, from the C7 family of assault rifles to the LAV-III light armoured vehicle, are acceptable (and perhaps even ideal) for modern urban operations where political realities place restraints on the maximum use of available firepower. The Defence Staff's decision to focus on light infantry at the expense of heavier armour and artillery for the time being underscores this. While it is unlikely that the Defence Staff has been consciously honing the Canadian Forces for an expanded urban operations role given their failure to even mention such operations in *Defence Strategy 2020*, the coincidence of interests is a fortunate one.^[64] If current DND policy is fully realised, Canada can expect to have a premier FIBUA-capable Army in the near future.

The effectiveness of such a force, though, is contingent upon a number of changes and advances being made in the Canadian Army. The conclusion that Canada will be prepared for urban combat needs to be approached with this in mind. In order to meet this objective, this paper recommends that the following strategic and tactical measures be implemented for the Canadian Forces:

- Greater investment in systems and technology on the level of the individual Canadian soldier. Canada currently has no programs to match the American Future Warrior 2025, Objective Warrior, or Land Warrior, technological projects focusing on integrating small arms and high-tech equipment that make the individual soldier a complete weapon system. The U.S. Land Warrior project gives priority to increasing the lethality, survivability, and command and control capabilities of the soldier, and will cost some US \$2 billion when 45,000 sets of the equipment are fielded between 2001 and 2014.^[65] There is, theoretically, a great deal of merit in implementing technology at this level, especially in relation to urban warfare where the infantry does the most important fighting. Given the Defence budget, development of an independent system of this kind may be prohibitively expensive. However, it may be possible to "buy into" U.S. or other foreign development. In February of 2002 Canada became the second nation to join the U.S.-led Joint Strike Fighter project, committing Canada to US \$150 million over 10 years as a Level 3 partner in the project.^[66] It may be possible to enter into a similar agreement for the procurement of advanced soldier systems. The possibility definitely merits further exploration.
- Enhanced inter-operability with U.S. and other allied military establishments. This is an

important aspect of Canadian defence policy as outlined by both the *Army Strategy* and *Defence Strategy 2020*, but it has special ramifications for Canadian urban operations. The chances of the Canadian Forces deploying independently and alone outside of Canada are negligible; in any expeditionary situation the Canadian Army will be required to work with allied forces to achieve the objective. As a result, co-ordination among trans-national military forces will be a requirement for urban operations overseas. In the dense urban threat environment, this co-ordination will place allied soldiers literally shoulder-to-shoulder, and they must therefore be able to prosecute the conflict in a compatible fashion. An effective way to address this issue would be to arrange for more joint urban operations training with the United States; their programs and FIBUA-simulation facilities are some of the best in the world. Arranging for battalion-level co-operative exercises in U.S. facilities might be difficult, but sending individual sub-units on rotation to train for urban warfare with equivalent American formations might be possible. In order to maintain peak effectiveness in all levels of operations in urban terrain, Canadian Forces must be prepared to undertake co-ordinated efforts, collaborative operations, and total force integration.^[67] Presently, it would not be possible to field a combat-capable Canadian brigade for combined operations in the field with U.S. forces without extended periods of joint training.^[68] This is an issue that needs to be addressed if Canada wishes to continue its participation in multi-national efforts.

- Doctrine needs to be updated and expanded to address urban warfare not as a unique, peripheral scenario, but as an underlying assumption of all future Canadian deployments. This is statistically sound given the regions that Canadian soldiers are being sent. To this end, publication B-GL-300-002, *Land Force Tactical Doctrine*, needs serious revision and expansion of its core assumptions and tactical advice. Publication B-GL-300-001, *Operation Doctrine for Canada's Army*, needs to be updated accordingly to heed these realities. A made-in-Canada tactical doctrine for fighting in built-up areas is a requirement for the future.
- Existing training facilities for military operations in urban terrain need expansion, possibly using the Exercise URBAN RAM set-up at Griesbach as an example. Ideally, every major Canadian Forces Base housing an infantry battalion should have a unique FIBUA training facility. Sub-unit rotations could also be made to the existing Dwyer Hill facilities used by Joint Task Force Two (JTF2), which feature close-quarters combat areas normally used for hostage rescue training scenarios.^[69] Efforts should also be made to co-ordinate with the Canada Lands Corporation and the new Office of Critical Infrastructure Protection and Emergency Preparedness for opportunities to train inside Canadian cities with minimal disruption.

^[1] Scott Gerwehr and Russell W. Glenn, *The Art of Darkness: Deception and Urban*

Operations, (Santa Monica: RAND Arroyo Center, 2000), MR-1132-A, 2.

[2] U.S. Joint Doctrine Publication 3-06, *Doctrine for Joint Urban Operations*, (September 2001), I-2. See also: Scott Gerwehr and Russell W. Glenn, *The Art of Darkness: Deception and Urban Operations*, (Washington: RAND Arroyo Center, 2000), MR-1132-A, 7-10.

[3] The site of the highly-publicised 1993 U.S. operational disaster in Somalia, Mogadishu, is perhaps atypical of what one can expect from operational environments in the near future. “It was as if the city had been ravaged by some fatal urban disease. The few paved avenues were crumbling and littered with mountains of trash, debris, and the rusted hulks of burned-out vehicles...Every open space was clotted with the dense makeshift villages of the disinherited, round stick huts covered with layers of rags and shacks made of scavenged scraps of wood and patches of rusted tin.” Mark Bowden, *Black Hawk Down: A Story of Modern War*, (New York: Signet, 2000), 7-8.

[4] Christopher F. Foss, *Jane’s Tanks and Combat Vehicles Recognition Guide*, 2nd Ed., (New York: HarperCollins Publishers, 2000). Of the tank types reviewed, +20° elevation seems to be the maximum on orthodox-chassis main battle tank (MBT) guns, and most are below that. The German Leopard 1 MBT, a modified version of which Canada fields, power-elevates its 105mm gun from -9° to +20° (p. 36).

[5] Alan Vick, et al., *Aerospace Operations in Urban Environments: Exploring New Concepts*, (Washington: RAND Project Air Force, 2000), MR-1187-AF, 113.

[6] Bowden, *Black Hawk Down*, 52.

[7] For an adequate summary of the main points of armour limitations in urban environments, see: Canadian Forces Publication (CFP) B-GL-300-002/FP-000, *Land Force Volume 2 – Land Force Tactical Doctrine*, (Ottawa: Canadian Forces Publication, 1997), IIX 11. A brief but accurate look at the increasing role of rocket-propelled grenades and other anti-tank weapons in urban warfare can be found in: The Army Lessons Learned Centre, Dispatches, *Training for Urban Operations*, (May 2002, Vol. 9 No. 2), 15.

[8] Sean J.A. Edwards, *Mars Unmasked: The Changing Face of Urban Operations*, (Washington: RAND Arroyo Center, 2000), MR-1173-A, 24-27. Many factors contributed to the Russian disaster in Grozny, including a failure to encircle the city at the onset, poor reconnaissance, and an underestimate of Chechen strength and resolve in their capital city. However, given that 90% of Russian casualties in the campaign occurred during the initial advance into the city between Dec. 31st 1994 and Jan. 2nd 1995, massive failure on the tactical level in the urban environment of Grozny can be identified as the primary factor in the spearhead’s defeat. Also see, Olga Oliker, *Russia’s Chechen Wars: 1994-2000*, (Washington: RAND Arroyo Center, 2001), MR-1289.

[9] Vick, et al., *Aerospace Operations in Urban Environments*, 114-115.

[10] Bowden, *Black Hawk Down*, 93.

[11] Sean J.A. Edwards, *Freeing Mercury's Wings: Improving Tactical Communications in Cities*, (Santa Monica, Arlington, Pittsburgh: RAND Arroyo Center, 2001), MR-1316-A, 5.

[12] An effective Chechen tactic was to immobilise the first and the last vehicles of a large formation along a city street, thereby trapping the entire column and destroying it systematically. See: Olga Olikier, *Russia's Chechen Wars, 1994-2000: Lessons from Urban Combat*, (Santa Monica, Arlington, Pittsburgh: RAND Arroyo Center, 2001), MR-1289-A, 21.

[13] Canada's poor experience in Somalia in the early 1990s is an especially instructive case study in the new moral operating environment. For more information see: Report of the Commission of Inquiry into the Deployment of Canadian Forces to Somalia, *Dishonoured Legacy: The Lessons of the Somalia Affair*, (Ottawa: Public Works and Government Service Canada – Publishing, 1997); Donna Winslow, "Rites of Passage and Group Bonding in the Canadian Airborne," *Armed Forces & Society*, Vol. 25, No. 3, (Spring 1999), 429-257; Lt.-Col. Bernd Horn, *Bastard Sons: An Examination of Canada's Airborne Experience 1942-1995*, (St. Catharines: Vanwell Publishing Ltd., 2001), 185-201.

[14] Bowden, *Black Hawk Down*; Edwards, *Mars Unmasked*, 16-17.

[15] James Dunnigan, *How to Make War: A Comprehensive Guide to Modern Warfare in the 21st Century*, 4th Ed., (New York: HarperCollins, 2003), 26.

[16] Olikier, *Russia's Chechen Wars 1994-2000*, 57-58. In the 1999-2000 conflict, each Russian ground force company had an artillery or mortar battery attached for direct support, and the soldiers were comfortable with calling down indirect fire to hold the enemy at arm's length or "prepare" an area for an advance. Artillery as a whole was the basis for the '99-00 Russian campaign in Chechnya, and inflicted incredible damage.

[17] Benjamin S. Lambeth, *NATO's Air War for Kosovo: Strategic and Operational Assessment*, (Santa Monica, Arlington, Pittsburgh: RAND Project Air Force, 2001), 136-143.

[18] *Ibid.*, 144.

[19] Dispatches, Lessons Learned for Soldiers, *Training for Urban Operations*, 7.

[20] Dunnigan, *How to Make War*, 26.

[21] Quote by General Charles Krulak in "The Urban Operations Journal,"

<<http://www.urbanoperations.com>> (18 October 2003). This was General Krulak's indoctrination of what he called the 'Three Block War,' an interesting all-encompassing approach to the conduct of urban operations by the marines.

[22] International Peace Academy, *Peacekeeper's Handbook*, (New York: Pergamon Press, 1984), 106. While dated, this handbook gives standard operating procedures for peacekeepers that are still highly useful and relevant.

[23] *Ibid.*, 102.

[24] Yael Danieli (ed.), *Sharing the Front Line and the Back Hills: Peacekeepers, Humanitarian Aid Workers and the Media in the Midst of Crisis*, (Amityville: Baywood Publishing Company, for the United Nations, 2002), 37. This figure does *not* include threats from landmines, hostage taking, environmental hazards, and armed stand-offs.

[25] Edwards, *Mars Unmasked*, 28.

[26] Russell W. Glenn, *Marching Under Darkening Skies: The American Military and the Impending Urban Operations Threat*, (Washington: RAND Arroyo Center, 1998), MR-1007-A, 3.

[27] Oliker, *Russia's Chechen Wars 1994-2000*, 7-9.

[28] Canadian Forces Publication (CFP) B-GL-300-001/FP-000, *The Conduct of Land Operations – Operational Level Doctrine for the Canadian Army*, (Ottawa: Canadian Forces Publication, 1998), iv.

[29] *Ibid.*, 15.

[30] For a scathing critique of Canadian operational doctrine (or lack thereof) see: Lt.-Col. Ian Hope, "Misunderstanding Mars and Minerva: The Canadian Army's Failure to Define an Operational Doctrine," *The Army Doctrine and Training Bulletin*, Vol. 4, No. 4, Winter 2001-02, 16-29.

[31] CFP B-GL-300-001/FP-000, *The Conduct of Land Operations*, 71-72.

[32] CFP B-GL-300-002/FP-000, *Land Force Tactical Doctrine*, IIX 7-13.

[33] *Ibid.*, IXX 11-12. "Helicopters may be used for the following tasks [in an urban environment]: (a) visual and photographic reconnaissance to perform; (b) to provide fire support; (c) to control indirect fire or close air support; (d) to deliver troops to the tops of high buildings; (e) to move cut-off parties and reposition forces; (f) to provide radio relay and the positioning of communications facilities; (g) to evacuate casualties, particularly from areas inaccessible to wheeled or tracked vehicles; and (h) to deliver supplies." The emphasis is mine, and is placed on tasks that would require a great deal of aviation finesse and/or dangerous exposure to enemy anti-air fire in an urban

environment. For more information see: Vick, et al., *Aerospace Operations in Urban Environments*, 115.

[34] Reportedly even Joint Task Force Two, Canada's elite counter-terrorist unit, has had its share of difficulties with radio communications. Communications were found to be inadequate in at least two JTF2 training exercises, "Poseidon's Eye 3" and "Exercise Quadrant Brief." David Pugliese, *Canada's Secret Commandos: The Unauthorized Story of Joint Task Force Two*, (Ottawa: Esprit de Corps Books, 2002), 146-148.

[35] The Army Lessons Learned Centre, Dispatches, *Training for Urban Operations*.

[36] Canadian Forces Publication (CFP) B-GL-302-006/FP-001 Draft 1, *Soldier's Guide to Fighting in Built-up Areas*. Disappointingly, this document could not be located for use in this paper, and its existence is based on hearsay.

[37] Canadian Forces Publication (CFP) B-GL-309-006/FP-001 (CTC Interim 1), *FIBUA*. This document could not be located either. Comments are from: The Army Lessons Learned Centre, Dispatches, *Training for Urban Operations*, 37.

[38] Hope, "Misunderstanding Mars and Minerva," 29.

[39] Sharon Hobson, "Canadian Infantry comes out on top in restructure," *Jane's Defence Weekly*, Vol. 37 No. 21 (22 May 2002), 8.

[40] Department of National Defence, *Advancing with Purpose: The Army Strategy*, (2002), 20, 31.

[41] Canadian Forces Publication (CFP) B-GL-300-007/FP-001, *Firepower*, (Ottawa: Canadian Forces Publication, 1999), 52. "If an attack is expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects or a combination thereof which would be excessive in relation to the concrete and direct military advantage anticipated, then the attack must be cancelled or suspended."

[42] Edwards, *Mars Unmasked*, xvii. "Weapons remained essentially the same, especially where ROE prohibited the stronger side from fielding advanced tanks and artillery. Commercial off-the-shelf (COTS) equipment, nonlethal weapons, and precision-guided munitions (PGMs) were either not used, not considered, or were not decisive."

[43] Dunnigan, *How to Make War*, 25-26.

[44] Pugliese, *Canada's Secret Commandos*, 127. The British Special Air Service (SAS) has ordered a number of C7s for its inventory after tests showed that it was more reliable than the British SA80 and the U.S. version of the M-16. For more information on the C7 rifle and the C8 carbine, see: Canadian Forces Publication (CFP) B-GL-317-018/PT-001, *Weapons Volume 18 – The Rifle 5.56mm C7 and the Carbine 5.56mm C8*, (Ottawa:

Canadian Forces Publication, 1987.

[45] “Diemaco: Canada’s Centre of Excellence for Small Arms.”
<<http://www.diemaco.com> > (20 October 2003).

[46] Oliker, *Russia’s Chechen Wars 1994-2000*, 21.

[47] Canadian Army Web Page, “C2 AN/PVS-504 Night Vision Goggles (NVGs),” 6 August 2003,
<http://www.army.forces.gc.ca/lf/English/2_0_82_1.asp?uSubSection=82&uSection=3>
(20 October 2003).

[48] Joint Task Force Two evidently has ready access to all of this special equipment. Whether or not it will make its way into the inventories of regular Army forces remains to be seen. Pugliese, *Canada’s Secret Commandos*, 131-132. The SureFire Weapon Mounted Light attaches to the end of a firearm and, “is considered an excellent tool for counter-terrorism and fighting in built-up areas.” It works as a hands-free flashlight and has applications in temporarily blinding an enemy when shined in the face. The CLAM is similarly mounted on the end of a C7 or C8, and projects a powerful infrared laser dot that is invisible to the eye, but can be seen with specialised goggles worn by the soldier.

[49] CFP B-GL-300-002/FP-000, *Land Force Tactical Doctrine*, IIX 8. “(5) Weapon Employment. Short range weapons and grenades will be used extensively. Mutually supporting fire will be difficult to achieve. Indirect fire weapons and tanks may be of limited use.”

[50] Foss, *Jane’s Tanks and Combat Vehicles Recognition Guide*, 398-399.

[51] Major R.T. Steward, “Coyotes Stalk Multi-National Division (Southwest): Maximizing the Potential of the Coyote Reconnaissance Squadron in Bosnia,” *The Army Doctrine and Training Bulletin*, Vol. 4 No. 2, (Summer 2001), 49.

[52] For Saudi Arabia: *Ibid.*, 399. For U.S.M.C.: Tom Clancy, *Marine: A Guided Tour of a Marine Expeditionary Unit*, (New York: Berkley Books, 1996), 116. Many other variants exist, including a prototype Assault Gun model that features a tank-size 105mm gun.

[53] Clancy, *Marine*, 244.

[54] Brig.-General Glenn Nordick, “Fighting in Built-up Areas: We Can Do This, so Let’s Get on With it,” *The Army Doctrine and Training Bulletin*, Vol. 4 No. 3, (Fall 2001), 28.

[55] Canadian Forces Publication (CFP) B-GL-300-008/FP-001, *Training Canada’s Army*, (Ottawa: Canadian Forces Publication, 2001), 40-41.

[56] Land Force Western Area, "Fact Sheet: Facts on Exercise Urban Ram," 20 March 2001, <http://www.army.dnd.ca/lfwa_hq/Documents/Facts/FS-Urban-Ram.pdf> (10 October 2003).

[57] Conference of Defence Associations, *Caught in the Middle: An Assessment of the Operational Readiness of the Canadian Forces*, (Ottawa: Conference of Defence Associations Institute, 2001), 28, 37.

[58] Nodrick, "Fighting in Built-up Areas," 30.

[59] Conference of Defence Associations, *Caught in the Middle*, 27.

[60] The Army Lessons Learned Centre, Dispatches, *Training for Urban Operations*, 29.

[61] Nodick, "Fighting in Built-up Areas," 31.

[62] Chief of the Defence Staff, "Strategy 2020," June 1999, <http://www.cds.forces.gc.ca/pubs/strategy2k/intro_e.asp> (18 October 2003).

[63] Sharon Hobson, "Canada retains light infantry," *Jane's Defense Weekly*, Vol. 37 No. 16, (17 April 2002), 30.

[64] It seems more likely that the Defence Staff is planning its increased expeditionary abilities on the basis of expanding participation in U.N. peace support operations. However, given the overlap between urban operations and peacekeeping discussed earlier, these tasks are far from mutually exclusive. Increasing operational and tactical capabilities for urban warfare should be an integral part of mounting peace support (and, as this paper argues, most other) operations in the future.

[65] F.A.S. Military Analysis Network, "Land Warrior," August 1999, <<http://www.fas.org/man/dod-101/sys/land/land-warrior.htm>> (21 October 2003). With these estimates, then for under US \$2 billion the Canadian Land Forces could equip every soldier in the Regular Force and the Reserves with the Land Warrior system.

[66] Sharon Hobson, "Canada joins JSF programme," *Jane's Defense Weekly*, Vol. 37 No. 7, (13 February 2002), 8. A Level 3 partnership means that if Canada buys the JSF, research and development costs, valued at \$5 to \$7 million per aircraft, will be waived, and Canada will not have to use U.S. Foreign Military Sales purchasing, which would result in significant savings.

[67] David C. Gompert and Uwe Nerlich, *Shoulder to Shoulder: The Road to U.S.-European Military Cooperability – A German-American Analysis*, (Santa Monica: RAND Center for Euro-Atlantic Military Analysis, 2002), MR-1575-NSRD/RE, 32.

[68] Conference of Defence Associations, *Caught in the Middle*, 37-38. In order to avoid "subject creep" this paper is not going to address the severe restrictions currently facing

Canadian abilities to deploy forces abroad, although such considerations should temper the argument.

[69] Pugliese, *Canada's Secret Commandos*, 23.

