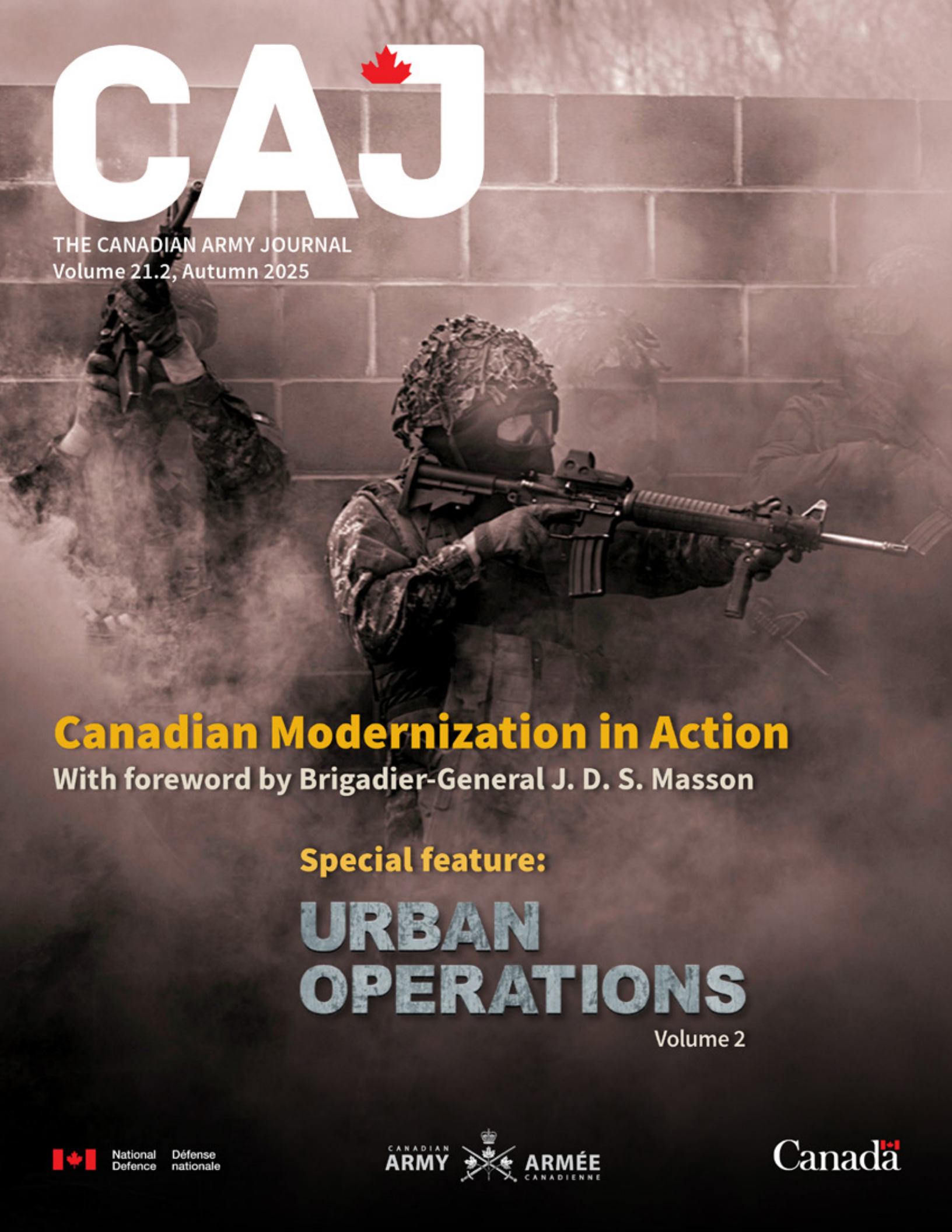


CAJ

THE CANADIAN ARMY JOURNAL
Volume 21.2, Autumn 2025

Canadian Modernization in Action

With foreword by Brigadier-General J. D. S. Masson

Special feature:

URBAN OPERATIONS

Volume 2

National Defence Défense nationale
CANADIAN ARMY ARMÉE CANADIENNE
Canada

CAJ

THE CANADIAN ARMY JOURNAL

CANADIAN ARMY ARMÉE CANADIENNE

CAJ

CANADA'S PROFESSIONAL JOURNAL ON ARMY ISSUES

The *Canadian Army Journal*, a refereed forum of ideas and issues, is the official publication of the Canadian Army. This periodical is dedicated to the expression of mature professional thought on the art and science of land warfare, the dissemination and discussion of doctrinal and training concepts, as well as ideas, concepts, and opinions by all army personnel and those civilians with an interest in such matters. Articles on related subjects such as leadership, ethics, technology, and military history are also invited and presented. The *Canadian Army Journal* is central to the intellectual health of the Canadian Army and the production of valid future concepts, doctrine, and training policies. It serves as a vehicle for the continuing education and professional development of all ranks and personnel in the Canadian Army, as well as members from other environments, government agencies, and academia concerned with the Canadian Army, defence, and security affairs.

DISTRIBUTION AND SUBSCRIPTION

The *Canadian Army Journal* (ISSN 1713-773X) is distributed throughout the Army and to select National Defence Headquarters, Royal Canadian Navy, Royal Canadian Air Force and Directorate of Information Systems Operations addresses.

Copies are also provided to defence-related organizations, allied armies, and members of the public and academia. Inquiries regarding distribution, subscription, and change of address are to be made to thearmyjournal@forces.gc.ca. On the Internet, visit The *Canadian Army Journal* at http://publications.gc.ca/site/eng/9.505131/publication.html.

SUBMISSION GUIDELINES

Unsolicited article manuscripts, research notes, book reviews, and points of interest are welcome. Articles should be 4000–6000 words inclusive of endnotes, research notes 1000–2500 words inclusive of endnotes, and book reviews 1000–1200 words. Articles may be submitted in either official language. Authors must include a brief biography. Authors must supply any supporting tables, charts, maps, and images, and these should not be embedded in the article text. Articles may be submitted via email or regular mail. All submissions are peer reviewed and the Editor-in-Chief will notify contributors on the status of their submission. Further details regarding author submission guidelines are available at https://www.canada.ca/en/army/services/canadian-army-journal.html

DISCLAIMER

Opinions expressed in the articles remain those of the author and do not represent Government of Canada, departmental or Canadian Armed Forces official policy. The doctrine, training, and other updates do not represent authority for action on that particular topic. All published material remains the copyright of The Department of National Defence.

PRODUCED FOR

Chief of the Army Staff detachment Kingston
(Canadian Army Land Warfare Centre)
PO Box 17000 Stn Forces, Kingston, Ontario,
K7K 7B4, Canada

DESIGN AND PRODUCTION

Army Publishing Office (APO), Kingston, Ontario,
K7K 7B4, Canada

WEBSITE

CADTC Webmaster

COVER PHOTO CREDIT

Canadian Armed Forces Combat Camera

CORRESPONDENCE

All correspondence, contributions, and submissions should be sent to

The Canadian Army Journal
c/o the Editor at Canadian Army Detachment Kingston
(Canadian Army Land Warfare Centre)
PO Box 17000 Stn Forces, Kingston, Ontario,
K7K 7B4, Canada

Telephone: 613-541-5010 ext. 2898
Fax: 613-540-8713
Email: thearmyjournal@forces.gc.ca

ISSN—1713-773X
NDID—R-GL-007-000/JD-021
Print—Bilingual Tumble

CONTENTS

CANADIAN MODERNIZATION IN ACTION

5 **FOREWORD**

Brigadier-General J. D. S. Masson

6 **OPERATIONAL READINESS THROUGH WARGAMING: SCALING THE CANADIAN ARMY FOR ITS IMMINENT CHALLENGES**

Major Mikalena Halos

SPECIAL FEATURE: URBAN OPERATIONS, VOLUME 2

14 **BACK TO THE FUTURE: REVISITING THE USE OF "NEUTRALIZING OVERMATCH" TO PREVAIL AND TO MITIGATE OVERALL DESTRUCTION IN URBAN WAR**

Dr. Charles Knight

26 **THE 2020 BATTLE OF SHUSHA: A UNIQUE URBAN BATTLE WITH MANY LESSONS FOR MODERN WARFARE**

John Spencer

38 **RUSSIAN URBAN OPERATIONS DOCTRINE AND THE ATTACKS ON KYIV AND KHARKIV**

Major Jayson Geroux, CD

50 **URBAN COMBAT AND SMALL UNIT URBAN TACTICS: RUSSIAN OBSERVATIONS OF UKRAINIAN TERRITORIAL FORCES**

Dr. Lester W. Grau and Dr. Charles K. Bartles

62 **FIGHTING IN CITIES: INSIGHTS FROM THE BATTLE OF MARAWI**

Ann Bajo

72 **URBAN WARFARE: EXPERIENCES AND LESSONS FROM BATTICALOA, EASTERN SRI LANKA**

Colonel (Retired) Rajesh Singh

80 **THE PEOPLE'S LIBERATION ARMY AND NEW TECHNOLOGIES IN URBAN WARFARE**

Jesús F. Román García

96 **BOOK REVIEWS**

FOREWORD

The Canadian Army is at a pivotal moment in its history. The world around us is changing at an accelerated pace. Canada has a more important role than ever to play in this new environment: supporting our allies abroad, promoting peace, defending free trade and the rule of law internationally, and ensuring security and stability domestically. We once assumed that these conditions were guaranteed. They are not. Foreign powers, of multiple natures and scopes, challenge the basis of our society with ever more sophisticated means. The proliferation of advanced technologies and the increasing complexity of pan-domain operations are reshaping the character of warfare.

Our adversaries are not waiting. They are adapting and preparing for conflict across all domains. Through non-conventional tactics, they have been actively shaping the battlespace. Frictions—if not skirmishes—are already contained daily in the informational and cyber spaces. The Canadian Army is therefore embarking on an urgent and comprehensive modernization effort not for tomorrow, but for today. Inflection Point 2025 (IP2025) is our roadmap to deliver scalable, agile combat power for today's fight and tomorrow's demands. IP2025 outlines how we will modernize our force structure, enhance readiness, and develop the capabilities necessary to operate effectively in a complex and dynamic battlespace. This modernization cannot be achieved in isolation; it requires a collaborative approach with the whole Department of National Defence, Canadian society and industry, where each partner contributes its unique expertise. Together, we will build the army Canada needs. It will be an army that is ready, resilient, relevant and lethal. The stakes are high. The Canadian Army must be ready because the enemy will not wait. Our modernization is not optional. It is essential. IP2025 is not merely a document. It is a call to action to think differently, act decisively and lead boldly.

This issue of the *Canadian Army Journal* is a powerful reminder of what it means to pursue excellence in the Canadian Army. It showcases the collaborative spirit of commissioned and non-commissioned members, both active and retired, working alongside public servants, defence scholars and international allies. Together, they bring diverse perspectives, challenge assumptions, draw on lessons learned, and contribute grounded, experience-based thinking to complex problems. The focus of this issue—urban operations—demonstrates just how much depth and rigour a single topic demands. Differentiating between decisive best practices and well-intentioned but naive or biased opinions requires serious intellectual effort. The level of inquiry presented here reflects the professionalism and critical thinking that must underpin our approach to modern warfare.

The future land operations environment is filled with similarly complex and consequential topics. This journal stands as a testament to the importance of thoughtful analysis, open dialogue and a commitment to doing things not just correctly, but exceptionally well. Its editorial team has been entrusted with carrying that mission forward in the years ahead. You can expect many more articles on modernization as we move forward.

As IP2025 is put in motion and new announcements are made this year and in the following years, as we scale to seize, hold and defend territory in support of Canadian sovereignty and allied defence, it will be important to foster a reflexive, analytical and intellectually rigorous culture throughout all levels of the Army: a culture of excellence. In today's environment, doing what must be done is no longer enough; we must be the best at doing it. The process of preparing, adapting and thinking ahead is what will give us that edge. I encourage all readers, including soldiers, scholars, allies and partners, to engage with these ideas, carry them in their specific units, discuss them with friends, put them in question and, through all of that, contribute to the transformation ahead.

Brigadier-General J. D. S. Masson OMM, MSM, CD
Chief of Staff Army Strategy

OPERATIONAL READINESS THROUGH WARGAMING:

Scaling the Canadian Army for its Imminent Challenges

Major Mikalena Halos

As the Canadian Army races toward a strong, modernized, efficient force, the value of strategic and creative thinking cannot be overstated. Modern and effective equipment is important. However, understanding the tactics involved around these new capabilities is arguably as important as the capabilities themselves. Canada, alongside our allied nations, has come full circle to reincorporate an age-old exercise, used through ancient and modern warfare, for informing tactics and strategy: wargaming.

By definition, a war game is a simulation or modelling opportunity that reflects a military conflict scenario. It can be purposed to study decision making, strategy, deception or logistics by creating or recreating a scenario in which each player is set against a cognizant, thinking enemy force in a controlled setting. While other training methods have their merits, none can replicate the complexity and comprehensiveness of conflict simulation achieved through wargaming. This is especially true when addressing higher-level formation training, up to the divisional level.[1]

There has been recorded evidence of wargaming throughout history: from the ancient Greek historians Thucydides and Polybius analyzing tactical decisions, indirectly contributing to the study and rehearsal of warfare, to the more recent and notable example of the "Kriegsspiel" (war game in German) developed in the 1820s by Georg Leopold von Reiswitz for use by the

Colonel David Brassard (Commander of the 5 Canadian Mechanized Brigade Group) during a Canadian Mechanized Brigade Group war game, April 2025.

Prussian Army.[2] World War II saw and expanded the use of wargaming for planning operations and informing commanders, which has since progressed with modern, computer-assisted war games (along with modern access to information) that enhance the ability to model complex weaponry operations and enabling technologies.[3]

The Canadian Army is in the process of modernizing our force through many avenues: capabilities, technology, tactics, training, and force organization and structure. To investigate how new capabilities may fare against modern opponents, wargaming provides an incredible opportunity to test these capabilities and how we employ them in a safe, flexible and cost-effective environment. Wargaming provides us insights into the strategic thinking of both friendly and adversarial entities, capability requirements, and the doctrinal/conceptual strengths and weaknesses of both forces.

The strength of modern wargaming has been recognized by many of our allied partners. We see its importance demonstrated by, for example, the U.S. Army's Future Study Program, a series of strategic-level war games to analyze future security challenges and inform defence planning; the Australian–US Exercise TALISMAN SABRE, a multinational war game focusing on crisis-action planning and contingency response, enhancing both nations' military capabilities; and the UK-led Exercise CERBERUS, which focused on demonstrating warfighting capabilities and enhancing interoperability between British and German forces.[4]

As we look toward our own forces and capabilities, the Canadian Army has put wargaming to use in supporting efforts toward modernization. Most recently, for two weeks in April 2025, the Canadian Army Land Warfare Centre (CALWC), supported by the Canadian Joint Warfare Centre (CJWC) and the Army Modernization Team (AMT), coordinated a war game that tested the structure, employment and capabilities

of a 2027 and 2033 Canadian Mechanized Brigade Group (CMBG) against a capable peer adversary. The game was held in Valcartier, Quebec, over the course of two weeks. Two teams, representing a CMBG and an adversarial brigade group, met in a Euro-Atlantic theatre of operations. The scenario saw a meeting engagement in major combat operations, where both teams attempted to seize key objectives. In total, four spirals were conducted that played out the same scenario but modelled the brigade structures on current and future capabilities that are expected to be delivered between 2027 and 2033. Brigade staff members, ten on each team, were employed in their respective roles to ensure that players had the necessary background and knowledge to play the part appropriately and to identify capability gaps and weaknesses in employment that surfaced throughout the event. In total, players and observers submitted a total of 131 observations on a variety of tactical and operational topics.

While addressing key weaknesses, vulnerabilities and gaps in the current and proposed CMBG structures, some insights included:

"The Sense-Act gap… was identified as a challenge, as there was insufficient situational awareness to fully utilize equipment at the front and maximize its advantage. There were difficulties in maneuvering, coupled with a lack of offensive capability. The available Sense assets were not properly grouped, and there was no penetration into depth."

"While the heavy cavalry regiment was effective in facing off against tank battalions, it led to large attrition rates. Speculative fire, including indirect fire (IDF) and scatterable minefields, were used, and the rules of engagement (ROE) may need to be reconsidered for a timelier response."

"Regardless of the turn or spiral, we were outgunned… a re-evaluation of the counterbattery fight is necessary. The extended range of [rocket artillery] is critical to neutralize supporting artillery, allowing for better concentration of fire and enhanced manoeuvrability in close combat, thereby improving overall effectiveness."

"Unmanned [and loitering munitions (LM)] systems require significantly less sustainment and offer a substantial impact that can be capitalized on... Using LMs as ISR (intelligence, surveillance and reconnaissance) platforms increases our identification capacity while also providing the ability to strike"

"HQs need smaller headquarters. The EW (electronic warfare) functions require the ability to provide decoy command posts (CP) and high-value targets (HVT)"

Upon completion of the war game, CJWC, CALWC, and the AMT compiled all the data, defined observable patterns and were able to make recommendations based on player contributions in conjunction with this data. A 42-page report detailed the war game structure, findings and recommendations and has already been used as a stepping stone toward changes in the Canadian Army's capability development plan moving forward.

After the successes of this event, and the incredible number of lessons learned from its execution, the Canadian Army looks toward our next bound in wargaming: warfighting at the division level. There were many aspects of warfighting that were not included in this past event, ranging from deep, shaping fire to the influence of space-based surveillance and interference of electronic warfare. Many of these aspects are becoming extremely influential in the current battlespace. As modernization continues to accelerate, new operational domains will need to be included in simulation exercises, continuing to prepare our staff for decision making in an increasingly complex, multi-faceted environment. To ensure that the Canadian Army looks to these areas for analysis, a war game campaign has been developed which will focus on shaping, enabling operations, as well as medical support, sustainment and logistics. It is time for the Canadian Army to play; to be an influential, involved participant in the evolution of modern warfare, and to make strides toward building a strong, technologically advanced, lethal force.

ABOUT THE AUTHOR

Major Halos, a Signals Officer by trade, is currently employed at the Canadian Army Land Warfare Centre (CALWC) in Kingston, Ontario. She joined the Canadian Armed Forces in 2016, and was posted to the Joint Signal Regiment in Kingston, Ontario, which included a deployment to Mali as part of Operation PRESENCE in 2019. She has had three children since joining the CAF and continues her employment at CALWC as a Wargaming Coordinator and Experimentation Team Lead.

ENDNOTES

1. Stuart Lyle, "The Role of Wargaming in Urban Operations Training," *Canadian Army Journal* 22.1 (2024): 36–45.

2. Philip Sabin, *Simulating war: Studying con lict through simulation games* (London: Bloomsbury Publishing, 2012); Jorit Wintjes, "'Not an Ordinary Game, But a School of War': Notes on the Early History of the Prusso-German Kriegsspiel," *Vulcan* 4, 1 (2016): 52–75. doi: https://doi.org/10.1163/22134603-00401003.

3. John Curry, "Professional wargaming: A flawed but useful tool," *Simulation & Gaming* 51, No. 5 (2020): 612–631.

4. Australian Army, "Exercise Talisman Sabre," accessed November 3, 2025, https://www.army.gov.au/our-work/exercises/exercise-talisman-sabre; British Army, "British Army demonstrates warfighting capability in Germany," October 23, 2024,https://www.army.mod. uk/news/british-army-demonstrates-warfighting-capability-in-germany/.

Special Feature:

URBAN OPERATIONS

Volume 2

Edited by Aditi Malhotra, Ph. D., Editor-in-Chief and Major Jayson Geroux, CD, Guest Editor.

EDITORIAL

As we conclude this second volume on the theme of Urban Warfare, I find myself reflecting on the changing global landscape, the fragility of our security, and the ever-evolving trends in warfare. The topics we have covered here are not just theoretical, but they are a glimpse into what is coming for us as a global community. What we see now—global conflicts and power struggles in a shifting world order—is just the beginning. These tensions will escalate, testing military forces to their limits. The coming years are critical, and armies will have to confront their strengths and weaknesses in new ways. While it may feel too late to change course, it's more important than ever to start preparing—not only our military but our citizens—for a future with higher risks and more severe consequences.

It is in these transitional moments that I must share a personal note with all of you. After two and a half incredible years, I will be stepping down as the Editor-in-Chief of the Canadian Army Journal (CAJ). It has been a great honour and a profound responsibility to lead this journal through a time of meaningful change. But, as all things must evolve and progress, I am thrilled to announce that Mr. Frédéric Dion will be stepping into the role. With his expertise in academia and keen understanding of effective communication, I have no doubt that he will propel CAJ to even greater heights. I look forward to seeing how his leadership will shape the journal's future.

Reflecting on my tenure, I cannot help but feel an overwhelming sense of gratitude for the dedicated individuals who have made this journey possible. The CAJ Editorial Staff and the incredible team at the Army Publishing Office—small, but relentless in their commitment—formed the bedrock upon which we built this journal. Together, we embraced opportunities, overcame challenges, and brought our shared vision to fruition. To the CAJ Assistant Editors, Major (Maj) Bruce Rolston and Second Lieutenant Nicolas Brown, and the APO team—Ms. Susan Russell, Ms. Francine Lefebvre, Ms. Rebecca Abrams and Mr. Brandon Denard—thank you wholeheartedly for your unwavering support, hard work and dedication to CAJ's mission.

We were fortunate to gain the backing of the Canadian Defence Academy for social media outreach, and I must extend a special thank you to Ms. Cassandra de Bartok for her efforts in making this connection possible. This partnership, coupled with our social media engagement, has enabled us to connect with our readers in new and impactful ways. We launched a new website with an electronic subscription option, allowing us to stay connected with our readers and keep them updated on our latest publications. Many thanks to ADM(PA), DAPA, Mr. Douglas Sherman and once again, Maj Bruce Rolston, for their excellent work on our website's production, accessibility and outreach.

In the spirit of innovation we launched *Short Bursts*, a platform that has quickly become a cornerstone of our website, attracting many submissions. This initiative has allowed us to explore contemporary issues through short-form content, providing an alternative avenue for discussion and exchange of ideas. For *Short Bursts*, we were fortunate to receive outstanding support from the Army Translation Services and their exceptional team. Additionally, we are currently digitizing the older, pre-1998 editions of CAJ, which will be available on our website in the coming months. Maj Bruce Rolston's contributions to this monumental project are incredible and his dedication has been instrumental in making this ambitious effort a reality. A special mention must go to Lieutenant-Colonel (LCol) Matthew Rolls, whose efforts in revitalizing the *Tactical Decision Games* section of the CAJ website has been nothing short of transformative.

None of this would have been possible without the ongoing support of the enthusiastic team at the Canadian Army Land Warfare Centre, especially Colonel Christopher Sines, LCol Michael Morin, and one of the strongest supporters of CAJ and an outstanding mentor, LCol Alain Carrier. I am deeply grateful for all the wisdom and encouragement you have offered during my time as Editor-in-Chief. A heartfelt thank you to Brigadier-General Tod Strickland, LCol Pat Newman, Maj John Bosso, Dr. Nancy Teeple, LCol Mike Rostek, Dr. Peter Gizewski, Dr. Ali Dizboni for being my champions and offering unwavering support throughout my time with the journal. Your belief in me has meant the world. I would like to thank the members of the Canadian Army and academia for their tremendous support and the valuable interactions we shared throughout. While it is difficult to acknowledge everyone individually, please know that your trust and support in the journal made my job a breeze and inspired me every single day.

As we turn our focus to this special feature's theme of urban warfare, I must give special recognition to Maj Jayson Geroux for his unparalleled dedication and boundless passion. His contributions have been nothing short of extraordinary, and the heart and soul he has invested in the urban warfare issues are truly remarkable. I am truly grateful for the dedication, support, and hard work.

Finally, my sincere thanks to our readers. The best ideas, perspectives and content we created have been largely shaped by your input. Your engagement, feedback, and support have been the lifeblood of this journal. To our contributors, our peer reviewers—thank you for believing in the mission of the *CAJ* and for making this journal the success that it is.

I am filled with optimism for the future of the *CAJ* under new leadership. As we navigate an evolving global order, I hope you continue to trust your journal for its valuable insights, its role in fostering meaningful dialogue, and its contribution to the ongoing discussions on topics relevant to the Canadian Army.

Thank you, all, for your incredible support. In closing, I leave you with this thought: "In times of change, it is not the strongest who survive, but those most adaptable to the evolving landscape of conflict and warfare."

Aditi Malhotra, Ph. D.
Editor-in-Chief

EDITORIAL

In the fall of 2022, when I began working with Dr. Aditi Malhotra on an urban warfare-themed edition of the *Canadian Army Journal*, we reached out to fellow urban operations scholars and practitioners to contribute articles and book reviews. To our pleasant surprise, we ended up having "catastrophic success"—nearly all responded positively and were pleased to contribute. Given the overwhelming number of contributions, Aditi's editorial expertise enabled us to expand the urban warfare-themed issue by adding a second urban-warfare themed special feature to the following issue. When organizing the content, I proposed structuring articles around the operational process—the themed edition could focus on subjects that need to be analyzed and conducted during the crucial planning and preparation phase, while the subsequent special feature could shift the focus on the execution phase, addressing the kinds of activities carried out during that phase of an urban operation.

The themed edition was published in late 2024 and has received positive reviews. We are hoping to build on that successful foundation and are now proud to present this special feature that has a number of well-known urban operations experts contributing. We are fortunate to have urban warfare researcher and historian Dr. Charles Knight leading with his initial article on the need for friendly forces to neutralize overmatch in urban warfare by either using overwhelming firepower while still applying the principle of concentration of force, or all things about by using other tools to reduce the amount of collateral damage and casualties occurred, which most believe—perhaps erroneously, he argues—must continue due to it being the historical norm in urban warfare. Next, world-renowned urban warfare scholar John Spencer discusses his findings on the strategically critical battle of Shusha from the Nagarno-Karabakh War in 2020 after he visited that city, reconnoitered the geographic and urban terrain, and interviewed some of the battle's participants shortly after the conflict concluded.

Furthermore, in the opening days of the Russo-Ukrainian War (2022–present) the attacks on the cities of Kyiv and Kharkiv left many believing that the Russians were completely inept with regards to fighting in urban environments. However, before jumping to that conclusion, it is necessary to understand Russian urban operations doctrine and its positive and negative outcomes. I have attempted to explain these in my article. Following that, Lester Grau and Charles Bartles—internationally known as subject matter experts on all things about the Russian military—provide and analyze an open-source Russian article from its *Army Digest* periodical on lessons identified in urban operations and a detailed description of their adversarial Ukrainian forces and the urban warfare tactics the latter employed in the beginning months of the war.

It would be incorrect and smug to assume that Western nations are the only countries that have urban operations experience. To highlight the global nature of urban operations and learn from non-Western perspectives, we solicited contributions from experts and practitioners who focus on the Far East and South Asia. As China continues to conduct bold military exercises around Taiwan—an island wherein approximately 80% of the population lives in an urban environment–we have asked Jesús Román García, an accomplished military magazine editor from Spain, to discuss China's urban operations capabilities and equipment. The 2017 battle of Marawi remains a fascinating case study for urban warfare enthusiasts. To shed light on the case, Ann Bajo, who was a defence analyst with the Armed Forces of the Philippines at the time, offers her in-depth review and analysis of the battle. A rare opportunity to understand some of the urban operations experienced during the relatively less-documented counter-insurgency operations in Sri Lanka in the late 1980s is discussed by Colonel (Retired) Rajesh Singh, who was a company commander during that time. The issue concludes with three book reviews by Noorulain Naseem and Muneeba Nawaz Khan, Colonel (Retired) Steve Macbeth and myself.

Unfortunately for the Canadian Army generally and the *Canadian Army Journal* in particular, Dr. Malhotra is ending her tenure as the editor-in-chief with this particular edition being her last. During her brief time, she has brought a high standard of academic rigour to the editions of which she was responsible in producing, and I along with many other writers have become better scholars as a result. Her warmth and personable demeanour made her a strong partner while we collaborated together on these two issues of the CAJ in particular.

We sincerely hope that you enjoy reading this urban warfare-themed special feature. We also hope that both issues have engaged you intellectually and also motivated you to think about and perhaps integrate more urban operations thoughts and training into your work in order to better prepare our soldiers, sailors and aviators for the inevitable urban warfare battles in which we will be participating.

Major Jayson Geroux, CD
Guest Editor

BACK TO THE FUTURE:

Revisiting the Use of "Neutralizing Overmatch" to Prevail and to Mitigate Overall Destruction in Urban War[1]

Dr. Charles Knight

At Groningen, however, the 2nd Canadian Infantry Division would face significantly stiffer resistance. They would also face new restraint … [the Canadians] would not employ artillery and air support against the city, with the understanding that damage to the city was to be prevented whenever possible. This marked a departure from the bombardment tactics the Canadians had used in previous urban attacks such as Ortona and Caen, and would require the 2nd Division to not only adjust their tactics to account for the loss of firepower, but to also minimize civilian casualties and collateral damage.[2]

INTRODUCTION

The conflict in Ukraine has brought urban areas into focus, while in Gaza the fighting is intensely urban. In Ukraine, what started as an invasion and a confrontation between two conventional armies unprepared for urban combat has degenerated into tactics and expenses reminiscent of the Great War. Despite the Israeli army's advanced technology, its operations in Gaza have caused significant political and physical damage, highlighting the severe consequences of urban warfare.

When attackers are unable to manoeuvre, they often resort to firepower and incremental assault, leading to high civilian casualties and massive collateral damage. This pattern, seen in recent urban battles such as Mariupol and Bakhmut, mirrors conflicts in Fallujah, Raqqa and Mosul, where defenders prompted attackers to use bombardments. In Ukraine, with both sides employing artillery on an industrial scale and making use of armoured vehicles the attacking combatants have paid just as high a price.

The question arises: Can the Western forces avoid the kind of destructive conventional urban combat seen in Ukraine? Analysts suggest that urban warfare will persist, given the political and tactical incentives it offers.[3] Although British and US military leaders recognize the need to prepare to fight in cities,[4] Western armies, shaped by decades of counterinsurgency and preparation for manoeuvre warfare on the plains of Europe, show signs of erratic investment in capability for urban warfare. For instance, while the Germans, French and Singaporeans have each built excellent training "towns," that does not address their lack of appropriate munitions and platforms. Overall, this situation leaves Western armies potentially vulnerable, especially if Anthony King's assessment that our armies are too small to prevail in cities proves accurate.[5]

However, this problem is fixable. Historical success stories suggest that focused applications of greater firepower, even if used in limited numbers, may offset force size limitations. Paradoxically, such an approach can reduce total urban destruction and suffering. This article proposes that Western armies should look to past success in combined arms urban warfare and return to applying the war principle of concentration of force to achieve neutralizing overmatch. The focus should be on equipping leading elements with capabilities to immediately neutralize points of resistance. The key is availability. While the use of overwhelming firepower is standard in open terrain, it is not part of the current thinking for urban fighting. Decades of counterinsurgency have led to a cautious, infantry-focused mindset that is often unsustainable. Typically, when a constrained force suffers casualties, it reverts to less discriminate and more destructive indirect fire.

This article highlights that, historically in some cases, the use of overwhelming direct force locally reduced overall casualties and collateral damage. It suggests that restoring potent, assured capability to penetrate and neutralize threats behind structures is crucial. Additionally, there are other ways to neutralize (i.e. to render ineffective or unusable) an urban enemy, including engineering systems to reshape the battlefield and developing the capability to fight within obscuration.

The case for change is made by reviewing the likelihood, nature and challenges of urban operations, then examining a British Commonwealth example of neutralizing-overmatch capability, discussing its nature, looking at lessons from the historical use of uncrewed ground vehicles (UGV), explaining relevant obscuration technology, and concluding by describing the elements of needed urban capability. It is important to note that although uncrewed aircraft systems have recently been radically changing combat, including in urban centres, this article specifically draws insight from historical contexts in which UGVs were featured at scale.

URBAN WAR: LIKELIHOOD AND CHALLENGES

Urban warfare is both increasingly likely and challenging for Western armies. Analysts have long warned that "the future of war is in cities."[6] This follows logically from Kilcullen's four megatrends—population growth, urbanization, littoralization and connectedness—which together dictate an urban future for the planet.[7] The notion that armies can avoid engaging in a disadvantageous fight in cities is disproven by cases such as the initial, politically motivated, US attack on Fallujah in 2004.[8] The attack was largely an emotionally charged kneejerk response to pictures of the gruesome mutilation of the bodies of four American private military contractors. It was conducted despite forceful and prescient military advice against it, and it had disastrous strategic consequences for the broader conflict.[9]

The seemingly unavoidable violence in humanity's urban future can be understood by examining three key drivers: urban cover, community conflict and urbanization. However, these are not the sole factors. Cities will continue to be military objectives because they are centres of communication, resources and political power. With most of the global population living in rapidly growing, underserved urban areas, rural space is more limited now than it was in past conflicts. In addition, as communities are concentrated, friction between them and competition for scarce resources drive conflict. Overlaying this, adversaries avoiding the gaze of overhead sensors may seek out the physical cover of the urban fabric, while asymmetric enemies of the West may seek the proximity of civilians to inhibit the full power of modern weapons. Cities have become their preferred battlespaces.[10]

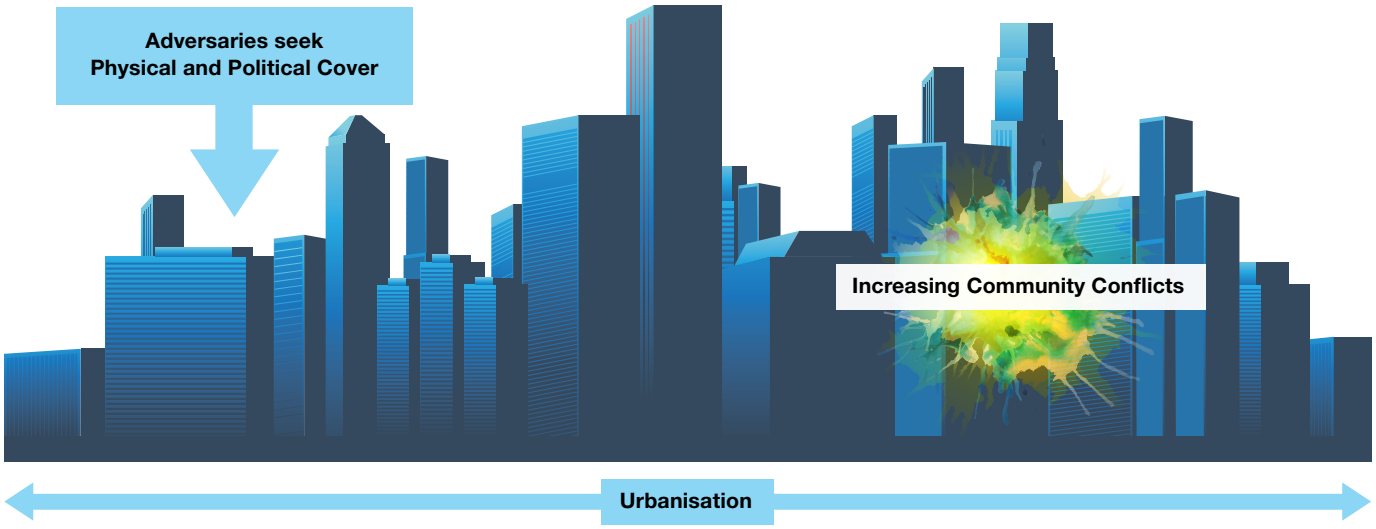


Figure 1: The Three Drivers of Urban Combat: Growing urbanization, increasing community conflicts and the adversaries' objective to seek physical and political cover during a conflict.

Contemporary combat in urban areas presents a range of military and political issues, including the question of non-preparation.[11] It might be useful to recognize that there are potential complications caused by the physical terrain and complexities stemming from the presence of populations.[12] Military operations lead populations to take on roles ranging from dependents to adversaries, influencing the narrative of informational warfare with unpredictable political consequences. Thus, while walls make urban war complicated, populations make it truly complex.[13]

THE CLOSE URBAN FIGHT: DEFAULT TO BOMBARDMENT

There is no doubt that buildings enable ambush. Historically, clearing determined defenders from buildings, be it in Jerusalem in AD 60 or Marawi in 2017, has imposed an attritional blood cost. Fighters must again and again enter enclosed spaces, often fighting at 1:1 ratio without support from comrades as they step inside. Once within, the fighters may be ambushed or encounter traps. To avoid this, a favoured response was to remove the threat by destroying the buildings with fire or projectile artillery. Since the late 19th century, there has been another method: high explosives (HE). With decreasing precision and user risk, HE can be placed, thrown, fired directly on a flat trajectory from cannons, fired indirectly at high elevation by mortars and howitzers, or dropped from aircraft.

HE freefall aircraft bombs and indirectly fired shells and mortar bombs disperse in flight, distributing lethal effects over an area and thus spreading urban destruction. While air supremacy in recent conflicts has allowed Western armies the greater discrimination of air-delivered precision guided munitions, devastation has not been prevented: Amos Fox has labelled this "precision paradox."[14]

In the past 60 years, there have been few cases of an army overcoming a determined and capable urban defence without extensive artillery and/or air bombardment.

Often indirect firepower has been the only way to strike enemy within urban terrain or support an isolated element. For example, in the 2017 attempted takeover of Marawi by ISIS–Maute, when soldiers of the Armed Forces of the Philippines responded, they were ambushed and their armoured vehicles were knocked out, leaving the survivors trapped. Only protective air and artillery fire over several days prevented the soldiers from being overrun.[15] Marawi is an unusual case where such firepower was used quickly and constraints came later. Typically, in populated areas there are initially tight restrictions on firepower that get relaxed as friendly casualties occur. In urban battles in Chechnya, Iraq and the Levant, there are examples where it appears that once attackers suffered a section to a platoon's worth of fatalities, there was an official or unofficial shift to more robust tactics.[16] In situations where attackers possessed overwhelming direct firepower and/or armoured bulldozers, they used them. Otherwise, they relied on indirect artillery and air power. The military, ethical and political challenges of such area bombardment remain acute.

Tactically, a city reduced to rubble becomes a continuous obstacle within which a defender can fight, move and hide. Operationally, and sometimes strategically, its facilities, routes and supplies are denied to the attacker. Infrastructure and resource destruction can generate both political issues, such as a shift in the war narrative against the attacker, and moral challenges with the potential for immediate casualties and reverberative civilian harm from disease, food shortages and refugee

flows.[17] Catastrophic levels of harm from urban war have been driving civil society and international humanitarian law (IHL) initiatives to restrict the use of "wide area effect explosive weapons" which, if adopted, are likely to impose additional tactical constraints.[18] In any event, while indirect bombardment degrades and temporarily suppresses defenders, it frequently fails to neutralize them.

As this article argues, there are better ways to conduct the urban fight, because our armies once used them. From the second half of 1944 onwards, the Western Allied armies eschewed urban area bombardment for political reasons yet overcame thoroughly prepared urban defences. Paradoxically, local concentration of firepower at neutralizing-overmatch levels, including flame warfare, proved to be ethically as well as tactically superior: civilian harm was drastically reduced.

COMBINED ARMS AND DIRECT NEUTRALIZATION

The Second World War taught that effective urban fighting demands focused firepower and combined arms: the low-level and synergistic integration of infantry, armour, engineers and other arms. Each 'arm' countered its companions' vulnerabilities and reinforced their strengths: infantry protected tanks from enemy infantry; tank firepower systematically destroyed infantry-located enemy positions; and engineers cut or blasted new routes for tanks and infantry through buildings and rubble, using large demolitions to destroy obstacles and strong points. Just as on open terrain, applying the principle of concentration of force produced mission success, speed, and reduced casualties. The main mechanism was enemy neutralization by

- destroying enemy positions in buildings, but also less obviously by
- opening new routes avoiding field of fire and mines, and
- creating physical or obscurant screens for manoeuvre.

Urban combined arms had to be learned. In the late 1930s (as perhaps now), most armies considered cities an infantry fight, having noted the loss of tanks to urban ambushes in Spain and China. They discovered that buildings limited the ability of a superior infantry force to concentrate on its small arms fire on overwhelming enemy positions. This heightened the significance of more powerful support weapons fire, particularly direct fire because it could be precise and immediately available.

The value of armoured-protected fire support became evident during the invasions of Poland, France and the USSR. German infantry made relatively rapid progress, aided by artillery *Begleitbatterien* equipped with 75 mm gun-armed self-propelled armoured vehicles known as *Sturmgeschuetz*. In response, the Soviets fielded the similarly armed SU-76. By the latter half of the battle of Stalingrad, both armies' doctrine emphasized intimate direct HE fire. The Western allies reached the same conclusion, exemplified by the Canadian use of tanks and antitank guns in the 1943 battle of Ortona, in which, whenever possible, infantry assaults on buildings were conducted into rooms shattered by HE shells or hand-placed explosives.

Infantry technique in the Second World War combined arms battle evolved to be the antithesis of contemporary dismounted "surgical" close quarter battle (CQB). Entry was preceded by the liberal prophylactic use of grenades and small arms fire through walls, floors and ceilings. Non-combatant casualties were not a key consideration. The Wehrmacht fired 30 mm *Schiessbecher* rifle grenades through windows and doors.[19] The US Army taught that it was "suicidal" to enter a room without first ensuring that all enemy within were dead or disabled. They emphasized techniques such as shooting holes in interior walls to "post" grenades, preferably M3 concussion grenades with four times the explosive fill of the fragmentation type.[20] Similarly, the British Commonwealth section-level clearing drill revolved around a section trailing and supporting the two bombers who systematically bombed all the rooms of a building. Their assaults conformed to not just machine gun but HE, 2-inch mortar, launcher, or tank fire from outside the building directed by the platoon commander. Tellingly, a British officer commanding troops during the 1945 Battle of Goch observed, "we hardly ever saw a live German," indicating that the defenders withdrew or were dead before clearing teams entered buildings or rooms.[21] Crucially, all armies learned to concentrate force and reduce the need for clearing by using HE munitions, preferably delivered from a survivable armoured platform and with the immediacy and relative precision of direct fire.

DECISIVE DIRECT FIRE

Urban combat on the Eastern front taught the opposing armies that although guns of about 75 mm calibre with a (typical) 500 g HE fill could neutralize defenders within lighter buildings, reducing and ending effective resistance in prepared strongpoints, stone and ferro-concrete structures demanded at least medium-calibre shells with about 5 kg of HE. Both sides developed heavily armoured self-propelled guns for street fighting. The German experience with the 150 mm gun–armed *Sturmpanzer* led to the *Sturmtiger*, which, as demonstrated in Warsaw in 1944, could destroy large building strongpoints by using a single 380 mm rocket mortar projectile with a 125 kg HE fill. The Soviet ISU-152, known for its heavy armour and reliability, could be considered one of the most effective urban fire support platforms ever fielded. Delayed fused concrete-penetrating rounds from its 152 mm high-velocity gun could punch through multiple walls and detonate deep inside defended buildings.

The decisive tactical effects of large HE warheads against defended buildings also inspired the Soviets to improvise means of firing individual M13/M30 Katyusha rockets from within buildings at adjacent objectives, at ranges down to 30 m. During the battle for Berlin, those rockets destroyed more than 120 buildings. One modification encased the original rocket with a further 50 kg of TNT to create a "land torpedo" able to "eliminate a building's garrison" with a single shot.[22]

In contrast, prior to the invasion of Europe, the Western allies did not anticipate needing more powerful armoured direct fire weapons other than for breaching Atlantic Wall concrete defences. Only when commanders ignored doctrine was those weapons' potency discovered. For example, during the 1944 battle of Aachen, a combined arms assault force based on two US infantry battalions struggled to advance against a resolute German defence. The employment of an unarmoured 155 mm self-propelled gun specifically brought forward for direct fire had immediate and significant effect. Defenders quickly withdrew from buildings struck by its delayed action shells; it created successive breaches in internal walls, allowing infantry concealed progress. Finally, it began to batter the concrete bunker command post. To quote the German commander, Colonel Wilck: "When the Americans start using 155 mm guns as sniper rifles it is time to give up."[23]

ALLIED CONSTRAINTS ON INDIRECT FIRE

As is the case for the Russian Army today, the Red Army during the Second World War regarded artillery as the "God of war" on all terrains, with massive area bombardments preceding urban attacks. In the wide roads and avenues of the industrial cities of the Western USSR, rubble obstruction was rarely prohibitive. In the denser old cities of Poland, timber-framed construction dominated and burned readily, forcing defenders to evacuate. In cases such as the assault on the medium-sized town of Insterburg (now Chernyakhovsk), resistance in the ruins lasted only a few hours. The Western allies, however, had to learn to fight without relying on such firepower. Attacks on urban areas following D-day, including those on Caen, Le Havre and Boulogne, were preceded by air bombardment, killing many French civilians and creating continuous obstacles. The political and tactical consequences obliged the Allies to change tactics, avoiding air bombardment and restricting heavier indirect artillery fire. Despite those restraints, by late 1944, British Commonwealth armies had mastered combined arms operations on urban terrain and were able to repeatedly and steadily clear well-defended towns, with modest casualty levels.[24]

NEUTRALIZING OVERMATCH WITH DIRECT FIRE: A CANADIAN EXAMPLE

In late 1944 and 1945, Canadian infantry formations advanced through the Netherlands into Germany. Manoeuvring through defensive fire and minefields in their turretless-tank Kangaroo armoured personnel carriers, they conducted successive successful urban assaults at modest cost by closely integrating the fight with British armoured assault engineer units from General Percy Hobart's 79th Armoured Division.[25]

While limits on air bombardment meant that streets were no longer blocked with rubble, the defender's positions and fields of fire remained intact. German skill at engaging from lateral defilade presented a particular challenge. Smoke obscuration supported the Canadians' advance. They employed white phosphorus (WP) hand grenades and 2-inch mortar bombs to enable tanks and infantry to bound unseen to new fire positions—a refinement of a technique learned at the Battle of Ortona. Nevertheless, as they advanced, the 75 mm gun-armed tanks were vulnerable to ambushing antitank guns, especially when exposed while firing multiple rounds to neutralize defended buildings. The lack of an armoured self-propelled gun was sorely felt, but another capability filled the gap. Tank-based engineer armoured fighting vehicles with dozer blades, flamethrowers, or demolition guns that had been designed to overcome obstacles on D-day proved key to systematically prevailing on urban terrain.[26]

The Churchill tank-based Crocodile flamethrower and Assault Vehicle Royal Engineers (AVRE) were heavily armoured and slow, yet they had exceptional ability to climb over urban obstacles and rubble, while Centaur armoured bulldozers could clear new paths to avoid enemy killing areas. The Canadians developed a potent assault technique. Whenever leading infantry encountered resistance, they would take cover and a Crocodile would fire a demonstration burst of flame down the street. The burning, smoking trail obscured the line of sight of enemy antitank guns, while radiant heat deterred infantry with handheld anti-armour weapons. An AVRE would then advance and fire a 12.7 kg demolition bomb. The munition, designed to breach heavy concrete emplacements, would collapse buildings and create clouds of smoke and dust that maintained obscuration. The following Crocodile would then flame the shattered target. The pattern became that normally resolute German defenders withdrew.[27]

FLAME AS NEUTRALIZING OVERMATCH

The neutralizing-overmatch nature of flame weapons is intuitive and was demonstrated in all theatres of the Second World War by the changes such weapons induced in the behaviour of attacked troops.[28] For example, the protracted pace of the 1944 US Army fight to capture

the fortified port of Brest accelerated when 15 British armoured flamethrowers arrived.[29] Similarly, later that year, when fighting to eliminate the encircled Allied paratroopers around Arnhem, the Germans initially suffered heavy casualties while clearing buildings. By employing self-propelled assault guns and flamethrowers, the Germans were able to drive the paratroopers from strong positions.[30]

There is a counterintuitive moral paradox. Flame is a horrific weapon and arguably causes excessive suffering. However, while its use in the 1945 Low Country battles burned target buildings and those adjacent to them, there was far less destruction and fewer casualties of all kinds compared to the 1944 urban artillery and air bombardment of Normandy. This article does not argue for the return of flame capability, despite its utility being underlined by current Chinese developments of flame weapons.[31] Rather, successful Commonwealth use of armoured flame demonstrates the tactical potency of combined arms that synergistically applies effects against which the enemy cannot protect themselves.

DELIVERING NEUTRALIZING OVERMATCH

The crux of neutralizing overmatch is psychological. All combined arms seek to overwhelm the enemy with concurrent effects and tactical dilemmas, but in the physically protective urban environment, the concept emphasizes generating "military impotence." The idea of inexorable effects is well illustrated by Israeli use of large, heavily armoured D30 "Doobi" bulldozers to collapse buildings rather than clear them during 2002 operations in Jenin. Islamist resistance fighters, apparently intent on martyrdom, surrendered unexpectedly. One explained that he did so because he could not achieve his ideological obligation to kill an enemy soldier.[32] Some Israelis drew a lesson from this: that in such close quarters urban fighting, the ratio of tanks to bulldozers should be 1:1. Mass may not be a prerequisite. At Aachen, "making resistance futile" was the decisive psychological contribution of a single 155 mm unarmoured self-propelled gun.

The vital idea is for leading elements to quickly render points of resistance ineffective or untenable. This requires destroying them outright, distributing rubble across their fields of fire and minefields, blinding their fields of fire, or creating routes to advance within cover. Such reshaping requires explosives and machines. This understanding is missing from the Western "counterinsurgency" understanding of urban war represented by uncritical adoption of special operations forces SOF CQB techniques.

Anthony King coined the term "Special Forcification" to describe misappropriation of methods developed for counter-terrorism (CT) recovery operations.[33] The swift crowded assaults developed by SOF for CT are vulnerable to explosive devices or counter-attacks and difficult to coordinate with intimate explosive firepower from outside the building: a decisive advantage forgone. Ironically, while conventional forces have enthusiastically adopted CQB methods, in urban battles such as in Mosul, SOF have shifted their tactics for the urban fight, specializing in the application of large, guided munitions. History offers few examples of infantry "overmatching" to rapidly clear determined defenders from buildings without supporting direct fires or heavy casualties, and those examples highlight the importance of explosive effects.

During the 1945 Battle of Berlin, the Soviets made local use of captured stocks of Panzerfaust to advance rapidly by successively breaching internal walls. Similarly, in the 1960s, successive detonations of bulk high explosives (often equivalent to several kilos of TNT) enabled Vietnamese sapper attacks using satchel charges, as well as Rhodesian assaults on insurgent headquarters using "hulk charges." Recognition of the utility of dismounted troops having a potent neutralizing tool led to the Soviet development of the RPO-A launcher, with a thermobaric warhead delivering the blast effect of a medium artillery round. In the later 1995 battles of Grozny, these weapons changed Russian urban tactics, techniques and procedures, with three-person fire support firing volleys that eliminated all resistance from buildings, obviating the need for combat clearance. The potential lesson is that infantry require stand-off weapons with warheads considerably more potent than the 40 mm, 66 mm or even 84 mm launchers that predominate in Western militaries. However, explosive effects alone, even when delivered by precision munitions, do not defeat an agile enemy like the Islamists in Mosul. That required armoured machines.

The great value of the now retired British Centurion AVRE and the American M60 Combat Engineering Vehicle (CEV) was that they reshaped the battlefield both explosively and mechanically. These dozer-fitted vehicles were armed with 165 mm guns firing a projectile with four times as much explosive as the largest tank round (18 kg versus the 4 kg of 120 mm HESH). Contemporary Western CEVs no longer have such capabilities, and contemporary reliance on main battle tanks (MBT) for urban fire support may represent risking a high-value platform to deliver smaller explosive effect than alternatives. The World War II Soviet employment of large-payload, short-range demolition rockets that could breach concrete walls, as described above, was not unique, and the Chinese have returned to the concept on their latest CEV. Most belligerents in the Second World War experimented with demolition rockets mounted on armoured vehicles, and the concept of a small platform with multiple weapon tubes able to "pop" and fire a volley was convincingly shown by the 6 × 106 mm Ontos that supported US Marines during the battle of Hue. Importantly, such capabilities no longer require crews: they can be UGVs.

ROBOTIC NEUTRALIZATION

UGVs have self-evident potential for transforming ground combat.[34] However, notwithstanding rapid US adoption of UGVs during the Iraq insurgency, subsequent massive research and development efforts and impressive remote weapon station (RWS) demonstrations, Western armies have been hesitant to adopt them. The reluctance can be attributed to a number of reasons including uncertainty regarding radio frequency control links, especially in the face of electronic countermeasures, and threat from enemy antiradiation munitions.

In Ukraine, the transformation of combat by drones in the air is being followed on the ground. Both sides have been observed to be successfully using UGVs for demolition and electronic warfare tasks, although the effectiveness of RWSs on UGVs deployed close to the frontline is less clear. In urban environments, however, factors including proximity of operators to UGVs and shorter engagement ranges mitigate technical challenges. We know that right now, basic UGVs can mitigate some of the acute risks of urban combat, as they did more than 70 years ago.

UGVs were first used operationally and for neutralizing defences during the Winter War of 1939. The Soviets deployed two battalions of Tele-tanks, optionally crewed radio-controlled T-26 tanks delivering smoke, flame or 500 kg demolition charges. Despite control problems, they played a role in the breakthrough of the Mannerheim defensive line. Stalin's purges of the Ostehburo development agency and execution of senior engineers saw the Tele-tank capability flounder. However, independently, a wire-guided demolition UGV designed by the military engineer, Alexander Petrovich Kazantsev, saw brief successful Soviet use on several fronts in 1941.[35]

During the Second World War, the Wehrmacht's fielding of 10,000 remote control assault engineering Funklenkpanzer UGV is better known, especially their Goliath.[36] This compact, rhomboid-shaped, tracked, wire-guided demolition vehicle delivered 60 or 100 kg of HE. The other main UGV was the Borgward B-IV, a car-sized, tracked armoured vehicle which was driven to the target area by a soldier and then controlled by radio from another AFV. Its function was to drop a 500 kg charge. While UGVs fell short of German hopes for minefield clearing, both types proved to be useful tools in urban settings for breaching and destroying strong points. In the 1942 assault on Sevastopol, they destroyed 36 bunkers and 12 gun positions, and during the 1944 Warsaw rising they played a key role in eliminating key Polish fortifications.[37] German and Soviet reporting on the use of UGVs in an urban context during the Second World War highlights that UGVs should be

a. large enough to have adequate hull clearance, step and gap crossing capability on rubble and urban obstacles,

b. armoured or resilient enough to survive engagement with ordinary small arms,

c. controlled by an operator able to directly overwatch its path,

d. provided with resilient means of control, and

e. employed in an all-arms context.

These insights not only influenced the development of the car-sized Springer demolition UGV towards the end of the Second World War, but also remain relevant even today.

Though disposable like the Goliath, the Springer was larger and relatively narrow with high sprocket wheels to cross urban obstructions. As a distillation of several thousand urban engagements, it represents a good guide for general-purpose urban UGV configuration enabled with the control systems developed over 50 years of robotic bomb disposal. An electric-powered contemporary version could be built for less than the price of a Javelin missile. It would have the interior volume for evacuating a casualty or moving stores, smoke generation equipment or ammunition for a weapon system. Like the Springer, it would be driven to the area of operations and, from there, operated by tether until broken and then by low-signature radio signal. It would be capable of direct mechanical and explosive-assist breaching and other engineering tasks. However, rather than carrying demolition charges it could mount short-range demolition rockets, providing the capability for "tank-like" neutralization overmatch even to air-portable forces.

UGV-delivered neutralization is not limited to explosive effects. It may also reshape the battlefield to render defenders irrelevant. Several countries have successfully converted obsolete MBT hulls to uncrewed CEV. By fitting new gearboxes, larger drive wheels and a dozer blade, they offer a bulldozer-like capability with many uses beyond the urban battlefield. Those "low silhouette" types without turrets or significant superstructure are particularly suitable for rapidly pushing manoeuvre pathways through buildings with minimal risk of dislodging horizontal support beams.

SMOKE NEUTRALIZATION

Smoke has been used for millennia to obscure in war, yet massive use during urban combat operations has escaped popular awareness, perhaps due to (necessarily) little imagery of it. In the battle of Cherbourg, one US mortar battalion fired 11,899 4.2-inch WP bombs. During the Second World War, all armies had dedicated chemical/smoke units, which were routinely employed to provide obscuration to cover the break into an urban area and subsequently to enable troops to cross open areas to assault strongpoints.[38] The Germans emphasized their Nebelwerfer smoke rockets for this while the Red Army teams used smoke pots and mortar bombs; both armies used pyrotechnic smoke grenades within buildings. The Western allies routinely used WP shells, mortar bombs and hand grenades—not only to screen movement in the open but also to strike and neutralize defended buildings by blocking their already restricted fields of view. The tactical use of smoke techniques has been neglected, despite viewing technologies that increase their utility.

For many years, the Western armies have had armoured capability to fight within thermal imagery (TI) translucent smoke and dust, as demonstrated convincingly during the 1991 Gulf War battle of the 73 Easting. This remarkable advantage has recently been given to infantry with TI systems that are head-mounted, or weapon-mounted with cable connections to head-mounted displays, allowing "shooting around corners." Yet, apparently, only the Israeli Defence Force has exploited fighting in smoke as a dismounted urban combat method.

In contrast, since the 1980s, Western armies have reduced stocks of and training with smoke munitions. Certainly, urban manoeuvre within effective smokescreens is almost never practised. This may variously reflect recognition of IHL concerns about WP use in urban areas, the lethal hazard to non-combatants from both base-ejection and base-emission smoke shells, or safety considerations around carcinogenic smoke inhalation and risk aversion flowing from unfamiliarity with WP grenades.

Technology offers a way forward. While conventional respirators do not offer protection, rebreather versions do—they filter exhaled breath to extract the carbon dioxide as small quantities of oxygen are supplied from a cylinder or chemical generator. Troops using rebreathers and TI systems can enter closed (and subterranean) spaces saturated with smoke to move and engage while the adversaries cannot see. Provided that the primary purpose of using the smoke is to obscure and that explicitly toxic compounds are avoided, this use should not breach the chemical weapons convention.

Further addressing humanitarian concerns, some obscurants present dramatically reduced hazard to non-combatants. These include vapour-based electro-mechanical smoke generators (as used in nightclubs), heat glycol, or oily mixtures to generate large volumes of innocuous condensing mist. Drogue obscurant delivery systems can use solid-fuel, lightweight-bodied, low-cost rockets to deliver payloads over many kilometres. A simple fuse deploys a drogue chute to slow the carrier to nonhazardous velocity, which scatters a payload of low-temperature burning smoke pellets. The combination of low-hazard smoke, rebreathing and TI equipment offers the unprecedented opportunity to fight "one-eyed in the kingdom of the blind."

THE WAY AHEAD

This article has discussed the nature of urban close combat using historical examples to highlight the value of neutralizing overmatch capability. Importantly, it identifies that without such capabilities, and given technological advances that favour defenders, an urban offensive fight is likely to become one of attrition that small Western armies cannot sustain. However, we can gain remarkable tactical advantage if we combine proven methods with contemporary technologies as follows:

1. **Obscuration** – The means to impose visual and thermal obscuration and fight within it should be an accelerated development priority. It can be expected to deliver great

psychological advantage, restore scope for urban manoeuvre, and enable interior and subterranean combat. Perhaps most significantly, it offers Western forces the political benefits of the means to fight effectively in urban areas with reduced collateral harm. There is potential to integrate TI opaque smoke munitions with translucent ones to blind enemy systems in a more sophisticated plan.

a. In the near term, there is an urgent need for instant obscuration means to replace the WP grenade at the lowest level. The 40 mm *handflammpatrone* (hand smoke launcher) is an exemplar.

b. Pyrotechnic smoke rockets offer a low-cost, proven, and low-hazard means of delivering obscurants. They may be launched from simple trailers or vehicle-mounted modules.

c. Thermal sighting and rebreather systems have been proven in service. Mastering their integrated use in an obscured environment is demanding but offers a niche that skilled Western soldiers will occupy more easily than challengers.

2. **UGVs** – Robotic systems offer huge future promise, but today many of the acute risks of urban warfare could be mitigated by swiftly fielding systems based on urban-proven, existing mechanical configurations, integrated with robust electronic systems.

a. Contemporary CEVs are sophisticated high-performance platforms that can be controlled remotely. Their value for urban operations is underappreciated. Arguably, an urban combined arm force should have as many CEVs as MBTs.

b. Medium, Springer-sized, basic armoured UGVs offer a tool to breach new manoeuvre pathways through buildings, move stores and casualties and mount weapons, especially short-range rockets capable of penetrating ferro-concrete walls with large explosive charges.

3. **Infantry explosive firepower** – Munition technology has created the opportunity to place very significant firepower in the hands of dismounted troops to attack or breach walls at a standoff. Neither these tools nor easy-to-use demolition charges are in widespread service. This should change, in order to allow enemy positions to be rapidly destroyed and a mobile defence defeated, and to limit the risks of and need for assault clearance. In addition, command detonation devices paired with cameras will improve discrimination when clearing among civilians and allow legitimate attack in blind spaces during the defence.

a. A shoulder-launched, confined-space weapon capable of delivering a warhead equivalent to several kilos of TNT into a building offers decisive urban combat capability.

b. A stand-off wall-breaching munition that can be fired remotely provides the opportunity to rapidly relay-breach a series of walls or barrier obstacles.

c. A modular demolition charge system with cameras and both radio and command wire initiation as well as “throwbot” camera-fitted devices that eject blast grenades offer improved tactical options and IHL compliance.

The adoption and integration of the above capabilities offers Western armies the opportunity to transform urban close combat to ethical and tactical advantage. It would not cease being gruelling, dangerous and psychologically exhausting, but pursuing neutralizing overmatch can be expected to deliver the same benefits it did in 1944/45: steady tactical success and fewer friendly, civilian and even enemy casualties.

ABOUT THE AUTHOR

Dr. Charles Knight has spent four decades studying urban combat methods, focusing on uncrewed systems and media portrayals of urban warfare. He teaches strategic security, unconventional warfare, and terrorism at Charles Sturt University, the University of New South Wales, and the

Theresian Military Academy in Austria. His Ph.D. researched coercion in counterinsurgency, and his master's thesis examined urban vulnerabilities, informed by fieldwork in the Lebanese civil war and Cambodia, as well as operational service with various militaries. In Australia, he commanded 2/17RNSWR and has over a decade of experience with special operations forces, currently serving as a reservist in the Australia Army Research Centre.

ENDNOTES

1. The lead image of this article was created by the author and is a modified version of an image originally published in a series of articles on The Wavell Room, https://wavellroom.com/category/concepts-and-doctrine/verlorne-haufen/, accessed on 21 August, 2024.

2. Jeffrey D. Noll, *Restraint in Urban Warfare: The Canadian Attack on Groningen, Netherlands, 13-16 April 1945*. DTIC Document, 2013, https://apps.dtic.mil/sti/pdfs/ADA590414.pdf.

3. Gian Gentile, David E. Johnson, Lisa Saum-Manning, Raphael S. Cohen, Shara Williams, Carrie Lee, Michael Shurkin, Brenna Allen, Sarah Lovell and James L. Doty III, *Reimagining the Character of Urban Operations for the US Army*, 13 March 2017, https://www.rand.org/pubs/research_reports/RR1602.html.

4. Michelle Tan, "Army Chief: Soldiers Must Be Ready to Fight in 'Megacities,'" *Army Times*, 5 October 2016, https://www.defensenews.com/digital-show-dailies/ausa/2016/10/05/army-chief-soldiers-must-be-ready-to-fight-in-megacities/; "Armies are re-learning how to fight in cities," *The Economist*, 2022, https://www.economist.com/international/2022/08/17/armies-are-re-learning-how-to-fight-in-cities.

5. Anthony King, *Urban warfare in the twenty-first century* (New York: John Wiley & Sons, 2021).

6. Michael Evans, *City Without Joy: Urban Military Operations into the 21st Century* (Canberra: Australian Defence College, 2007).

7. David Kilcullen, *Out of the mountains: The coming age of the urban guerrilla* (New York: Oxford University Press, 2015).

8. John Amble and John Spencer, "So You Think the Army Can Avoid Fighting in Megacities," Modern War Institute, 16 May 2017, https://mwi.westpoint.edu/think-army-can-avoid-fighting-megacities/.

9. Rajiv Chandrasekaran, "Key general criticizes April attack in Fallujah," *Washington Post*, 12 September 2004, https://www.washingtonpost.com/archive/politics/2004/09/13/key-general-criticizes-april-attack-in-fallujah/e73f1761-f744-4407-bbf5-8aa189c053cc/.

10. Stephen Graham, *Cities under siege: The new military urbanism* (London: Verso Books, 2011).

11. Mikael Weissmann, "Urban Warfare: Challenges of Military Operations on Tomorrow's Battlefield," in Mikael Weissmann and Niklas Nilsson (eds), *Advanced Land Warfare: Tactics and Operations* (Oxford Academic, 2023; online edition 13 April 2023), https://doi.org/10.1093/oso/9780192857422.003.0007.

12. For more, see Colin Papuschak, "Intelligence Preparation of the Urban Environment: Adopting a complex adaptive systems approach," *Canadian Army Journal* 21.1 (2024): 22–35; John Spencer, "The City Is Not Neutral: Why Urban Warfare Is So Hard," *Modern War Institute*, 03 April 2020, https://mwi.westpoint.edu/city-not-neutral-urban-warfare-hard/, accessed on 12 August 2024.

13. To explore this aspect in more detail, see Charles Knight, "The Twelve Challenges of Urban Warfare," *Grounded Curiosity*, https://groundedcuriosity.com/urban-warfare/, accessed on 12 June 2024; Colin Papuschak, "Intelligence Preparation of the Urban Environment: Adopting a complex adaptive systems approach," *Canadian Army Journal* 21.1 (2024): 22–35; Peter Dobias, "Navigating the Challenge of the Weaponization of Civilians: Leveraging Intermediate Force Capabilities," *Canadian Army Journal* 21.1 (2024): 64–73.

14. Amos C. Fox, "Precision Paradox and Myths of Precision Strike in Modern Armed Conflict," *The RUSI Journal* 169, no. 1/2 (May 2024): 1–13, doi:10.1080/03071847.2024.2343717.

15. Charles Knight and Katja Theodorakis, "The Marawi crisis—urban conflict and information operations," in Special Reports, *Australian Strategic Policy Institute*, 31 July 2019, p. 35, https://www.aspi.org.au/report/marawi-crisis-urban-conflict-and-information-operations.

16. Charles Knight and Li Ji, *The realities of war: recognising and planning for the decisive role of media on the urban battlefield* (The International Society for Military Ethics in Europe, 2021), https://www.euroisme.eu/images/Documents/OccasionalPapers/Knight-Ji_EuroISMEOccasionalPaper_3_2021.pdf.

17. Carter Malkasian, "Signaling resolve, democratization, and the first battle of Fallujah," *Journal of Strategic Studies* 29, no. 3 (2006): 423–452, https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=713f13e433d2df0ea06af5bf29570b97681395ca; Isabel Robinson and Ellen Nohle, "Proportionality and precautions in attack: The reverberating effects of using explosive weapons in populated areas," *International Review of the Red Cross* 98, no. 901 (2016): 107–145, doi: 10.1017/S1816383116000552.

18. John Bedard, "Explosive Weapons with Wide Area Effects: A Deadly Choice in Populated Areas," *Arms Control Today* 52, no. 2 (March 2022): 36, https://www.proquest.com/scholarly-journals/explosive-weapons-with-wide-area-effects-deadly/docview/2638775269/se-2.

19. "Gewehrgranatgerät," Lexikon der Wehrmacht, accessed 13 June 2024, https://www.lexikon-der-wehrmacht.de/Waffen/gewehrgranatgerat.htm.

20. US Army, FM Attack Fortified Position Combat in Towns FM 31-50(1), https://www.ibiblio.org/hyperwar/NHC/NewPDFs/USArmy/US%20Army%20Field%20Manuals/USArmy,%20FM%20Attack%20Fortified%20Position%20Combat%20in%20Towns%20FM%2031-50.pdf.

21. URBAN WARFARE WW2 – Fighting in Built Up Areas Documentary – Part 3 Goch, in British Army Documentaries (1979: UK).

22. M. Makarov, M.K., *Rocket artillery of the Red Army* 1941-1945. KM Strategy (Стратегия KM), 2005.

23. Robert W. Baumer, *Aachen: The US Army's Battle for Charlemagne's City in World War II* (Mechanicsburg, PA: Stackpole Books, 2015).

24. Jeffrey D. Noll, *Restraint in Urban Warfare: The Canadian Attack on Groningen*, Netherlands, 13-16 April 1945. DTIC Document, 2013, https://apps.dtic.mil/sti/pdfs/ADA590414.pdf.

25. Michael J. Daniels, *Innovation in the Face of Adversity: Major-General Sir Percy Hobart and the 79th Armoured Division (British*) [Potomac, MD: Pickle Partners Publishing, 2015].

26. Kenneth Macksey, *Armoured Crusader: The Biography of Major-General Sir Percy 'Hobo' Hobart* (London: Grub Street Publishing, 2004).

27. Andrew Wilson, *Flame Thrower: Memoir of a Crocodile Tank Commander, D-Day to the Rhine* (Bath, UK: Spitfire Publishers, 2022).

28. Leonard McKinney, *Portable Flame Thrower Operations in World War II* (Chemical Corps, Historical Office, 1949), https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/id/2796/.

29. Edward G. Lengel, "Forgotten Fights: Assault on Brest, August-September 1944," The National WWII Museum, 21 September 2020, https://www.nationalww2museum.org/war/articles/fortress-brest-assault-1944.

30. Antony Beevor, *The Battle of Arnhem: The Deadliest Airborne Operation of World War II* (London: Penguin Books, 2019). Flame throwers, a subclass of incendiary weapons, are not prohibited under IHL. They may be used under the usual provisions for "all feasible precautions" as well as requiring a clear separation between military objectives and any concentration of civilians. In contrast, air-delivered incendiary munitions may not be used within an area with a concentration of civilians. Munitions primarily designed to produce smoke, but with an incendiary effect, such as white phosphorus, are excluded from this prohibition. See UN Protocol III to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effect.

31. 吴昱 [Wu Yu] et al., 喷火器系统效能分析与评价 [*Analysis and Evaluation of Flame Thrower System Performance*]. 北京理工大学学报自然版 [Journal of Beijing Institute of Technology, Natural Science Edition] 39(8), 2019: 876–880.

32. Nathan L. Sayers, *Future Combat Vehicle Systems: Lessons from Operation Defensive Shield*, in DSTO-GD-0484 (Defence Science and Technology Organisation: Edinburgh, SA, Australia, 2006).

33. Anthony King, "Close Quarters Battle: Urban Combat and 'Special Forcification.'" *Armed Forces & Society* 42, no. 2 (2016): 276–300.

34. For more details on technically demonstrated technologies, see Charles Knight, "Der Verlorne Haufen," *Wavell Room*, https://wavellroom.com/2021/11/01/der-verlorne-haufen-chapter-1-autonomous-warfare/, accessed on 12 June 2024.

35. С.А. Смирнов, В.И. Зубков [S.A. Smirnov and V.I. Zubkov], *КРАТКИЕ ОЧЕРКИ ИСТОРИИ ВНИИРТ* [BRIEF STORIES OF VNIIRT'S HISTORY] (Москва [Moscow]: ВНИИРТ [VNIIRT], 1996), *http://pvo.guns.ru/book/vniirt/index.htm#_Toc122708803*.

36. Markus Jaugitz and David Johnston, *Funklenkpanzer, A History of German Army Remote- and Radio-Controlled Armor Units: The History of German Army Remote- and Radio-controlled Armor* (Winnipeg: J.J. Fedorowicz Publishing Inc, 2001).

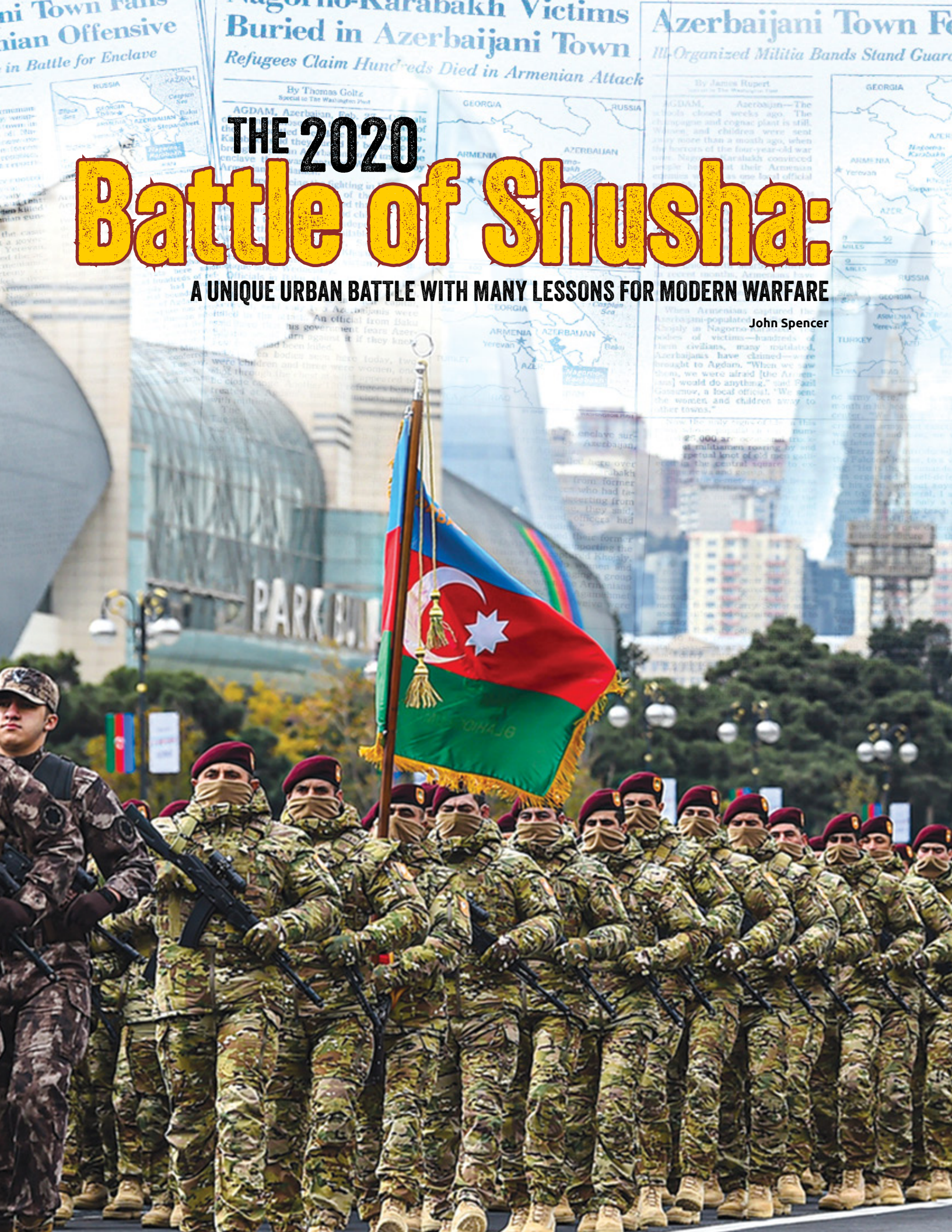
37. H.R. Everett, *Unmanned Systems of World Wars I and II* (Cambridge, MA: MIT Press, 2015), https://direct.mit.edu/books/monograph/4073/Unmanned-Systems-of-World-Wars-I-and-II.

38. Martin Poon, "The Role of White Phosphorus in Two World Wars," *Learn Chem E*, https://learncheme.com/wp-content/uploads/Prausnitz/OldandNewMaterials/RoleWhitePhosphorus.pdf, accessed on 12 August 2024.

THE 2020 Battle of Shusha:

A UNIQUE URBAN BATTLE WITH MANY LESSONS FOR MODERN WARFARE

John Spencer



INTRODUCTION: A CONFLICT OF SYMBOLISM AND STRATEGY

The Second Nagorno-Karabakh War (27 September–10 November 2020) was a surprise eruption of a long-standing conflict between Azerbaijan and Armenia over the disputed Nagorno-Karabakh region, a mountainous territory that had been a flashpoint for violence, political discord and deep-seated national grievances for decades. The contested land embodied the aspirations, fears, and historical narratives of both nations.[1]

The roots of the conflict date back to the early 20th century when territorial disputes and shifting borders under Soviet rule exacerbated divisions between Armenians and Azerbaijanis. Perched atop the Karabakh mountains was the city of Shusha that became a focal point of these tensions. It acted as a key stronghold in the region by virtue of its strategic location overlooking the Lachin corridor and the city of Stepanakert. That noted, Shusha's importance extended beyond its military utility. It stood as a cultural beacon, symbolizing the intertwined but often adversarial histories of the two peoples who claimed it as their own.[2]

For Azerbaijan, Shusha was a city of immense pride, and its architectural style of the Yukhari Govhar Agha Mosque and the vibrancy of Azerbaijani musical traditions often had the city described as the "cradle of Azeri culture." Its history as the capital of the Karabakh Khanate and its contributions to Azerbaijani literature and music have cemented its reputation as a cultural heartland.[3] For Azerbaijanis, Shusha became a cultural beacon, home to poets, musicians, and architects who shaped the nation's identity. It was home to important Azerbaijani figures such as Vagif, a poet who helped define Azerbaijani literary traditions, and Uzeyir Hajibeyov, the father of Azerbaijani classical music. Shusha's architecture reflects its Persian and Azerbaijani heritage. Its loss to Armenian forces in 1992 during the First Nagorno-Karabakh War (1988–1994) was a devastating blow to Azerbaijan and left a deep scar on the national psyche.[4] For decades, Shusha's recapture remained a national aspiration and a central symbol of the struggle to reclaim Nagorno-Karabakh.[5]

Source: Wikimedia Vugar Amrullayev

Source: Wikimedia

Panoramic view of Shusha, a city in the disputed region of Nagorno–Karabakh in the South Caucasus.

For Armenians, Shusha held an equally profound religious and cultural significance. The city is home to the Ghazanchetsots Cathedral, a symbolic Armenian religious architectural site.[6] Following its capture in 1992, Shusha became a cornerstone of Armenia's control over Nagorno-Karabakh, a victory celebrated by Armenians as proof of their historical and cultural ties to the land.[7] Its strategic position enabled Armenian forces to safeguard the Lachin corridor that connected Nagorno-Karabakh to Armenia. Over time, Shusha became a cultural and political anchor for Armenian presence in the region. Losing the city in the Second Nagorno-Karabakh War was not only a military setback but also a major blow to national pride and historical narratives of victory and resilience.[8]

The stakes of the 2020 conflict were thus existential for both sides. For Azerbaijan, retaking Shusha represented a reversal of past defeats and the restoration of national identity and sovereignty.[9] For Armenia, defending Shusha was essential to maintaining control over Nagorno-Karabakh and preserving its historical connection to the region. For both nations, Shusha is more than just a city—it is a repository of identity, memory, and resilience.[10] The battle for Shusha became the decisive battle of the war as it reshaped the geopolitical landscape of the Caucasus. It also provided a strong reminder of the centrality of urban warfare in modern wars.

HISTORICAL CONTEXT: SHUSHA'S LEGACY AND THE ROAD TO BATTLE

Shusha is perched at an elevation of 1,400–1,800 metres in the Karabakh Mountains. Its history reflects the broader patterns of conflict, empire, and shifting borders that have defined the Caucasus region for centuries. Founded in 1752 by Panah Ali Khan,[11] it became the capital of the Karabakh Khanate and emerged as a centre of political power and cultural development. By the late 19th century, Shusha was a cosmopolitan city, home to both Armenian and Azerbaijani communities who contributed to its artistic and intellectual flourishing. This shared heritage also sowed the seeds of division, as competing narratives about the city's identity and ownership began to harden.[12]

The city's strategic importance first came to the fore during the 19th-century Russo-Persian Wars, when Shusha's location made it a key defensive outpost for the expanding Russian empire.[13] The collapse of the Russian Empire in 1917 and the chaotic aftermath turned Shusha into a focal point of interethnic violence. As Armenians and Azerbaijanis vied for control of the South Caucasus region, Shusha became a key battleground.[14]

By the early 20th century, the establishment of Soviet rule in the region temporarily froze those disputes. In 1923, the Soviet Union created the Nagorno-Karabakh Autonomous Oblast (NKAO) within the Azerbaijan Soviet Socialist Republic (SSR), granting limited autonomy to the region's Armenian majority while keeping it under Azerbaijani jurisdiction.[15] This arrangement sowed resentment on both sides. While Armenians viewed it as a denial of their aspirations for self-determination, Azerbaijanis saw it as a concession that undermined their territorial integrity.[16]

The Soviet Union's dissolution in 1991 reignited the frozen conflict over Nagorno-Karabakh. As the newly independent states of Armenia and Azerbaijan sought to assert control over the region, Shusha once again became a focal point of the struggle. Capturing Shusha was critical for Armenians to consolidate their hold over Nagorno-Karabakh and for neutralizing Azerbaijani artillery positions that threatened Stepanakert, the region's administrative centre.[17]

On 8 May 1992, Armenian forces launched a surprise attack on Shusha, exploiting gaps in Azerbaijani defences and scaling steep terrain to penetrate the city.[18] The Azerbaijani forces were caught off guard and lacked coordinated leadership. Resultantly, they were overwhelmed and Shusha fell within hours. This victory allowed Armenian forces to dominate the Lachin corridor, which connected Nagorno-Karabakh to Armenia, and marked a turning point in the First Nagorno-Karabakh War.[19]

For Azerbaijan, the loss of Shusha was a national trauma.[20] The city's Azerbaijani population, which had been the majority before the conflict, was soon displaced and the city became a heavily militarized Armenian stronghold.[21] The symbolic weight of this loss left an indelible mark on Azerbaijani national consciousness, turning Shusha into a rallying cry for the country's future military and political efforts.

Between 1992 and 2020, Shusha became an integral part of Armenian-controlled Nagorno-Karabakh. Its favourable location overlooking Stepanakert and the Lachin corridor made it a linchpin of Armenian defences. Over the decades, Armenian leaders sought to reinforce Shusha's identity as an Armenian city, restoring cultural landmarks like the Ghazanchetsots Cathedral while maintaining military fortifications.[22]

However, this period also exposed vulnerabilities. Armenian forces overestimated the natural defences provided by Shusha's cliffs and steep access routes, assuming that they were impassable to attackers.[23] This reliance on static defences, combined with limited resources and international isolation, created conditions that would later be exploited by Azerbaijani forces during the Second Nagorno-Karabakh War.

By 2020, Azerbaijan had transformed its military capabilities. It invested heavily in advanced technology, modernized its forces, and forged strategic alliances with Turkey and Israel.[24] Shusha's recapture became a central objective in Azerbaijan's campaign by virtue of its strategic value and its symbolic importance. Azerbaijani President Ilham Aliyev repeatedly emphasized Shusha's role in Azerbaijani history and identity to galvanize public and military support for a future operation.

For Armenians, Shusha remained essential to their control of Nagorno-Karabakh. Losing the city would sever their access to the Lachin corridor, compromising their ability to sustain defences across the region. However, Armenian leaders failed to adapt their strategies to account for Azerbaijan's growing technological and tactical advantages.[25] The 2020 battle for Shusha would ultimately expose these weaknesses and reshape the region's geopolitical landscape.

THE MILITARY FORCES: A CLASH OF MODERNIZATION AND ENTRENCHMENT

The Battle of Shusha was not only a contest for control of a strategically significant city but also a stark contrast between two divergent military approaches. Azerbaijan, for its part, invested heavily in modernization and technology and brought a 21st-century approach to warfare by combining advanced systems with adaptive tactics. By contrast, Armenia relied on entrenched defences, traditional strategies, and the assumption that Shusha's natural geography would provide sufficient protection. The battle highlighted how differences in training, equipment, and leadership shaped the dynamics of urban warfare.[26]

Azerbaijan entered the 2020 war after years of deliberate investment in military capability, supported by oil and gas revenues and its strategic partnerships.[27] This transformation was evident in the battle of Shusha, where Azerbaijan's emphasis on manoeuvre warfare and the integration of technology proved decisive. Azerbaijan's armed forces consisted of approximately 126,000 active-duty personnel supported by an additional 300,000 reservists.[28] Their special operations forces (SOF) were highly trained units specializing in mountain warfare and proved to be central to the Shusha operation. Numbering several thousand, Azerbaijan's SOFs spearheaded the daring cliffside infiltration that bypassed Armenian defensive positions and disrupted their strategy.[29]

Azerbaijan deployed a diverse and modern arsenal during the campaign. Key elements included the following:

- Uncrewed air vehicles (UAV): The Turkish Bayraktar TB2 and loitering munitions like the Israeli Harop UAVs were instrumental in neutralizing Armenian artillery, supply lines, and fortified positions.[30]

- Armour and artillery: Azerbaijani forces utilized T-90 and T-72 tanks alongside BMP-2 infantry fighting vehicles, supported by advanced multiple launch rocket systems like the BM-30 Smerch.[31]

- Infantry equipment: Azerbaijani troops were equipped with modern rifles, night vision devices, and antitank guided missiles like the Kornet-E, enabling precision targeting of Armenian vehicles and fortifications.

Azerbaijan's military had undergone extensive training in combined arms operations, interoperability, and advanced technology integration. This included joint exercises with Turkish forces that provided Azerbaijani troops with experience in modern manoeuvre warfare.[32] These capabilities were evident in the battle for Shusha, where Azerbaijani forces adapted swiftly to the challenges of mountain warfare and urban combat, leveraging UAVs for reconnaissance and targeting while executing close quarters engagements with precision.

Azerbaijan's leadership played a critical role in the campaign. President Ilham Aliyev framed the war as a patriotic mission, galvanizing national support for military operations.[33] In the execution of the war, commanders like Lieutenant-General Karam Mustafayev and Major-General Hikmat Hasanov were recognized for demonstrating operational flexibility, coordinating the integration of UAVs, artillery and infantry in a cohesive strategy that were fundamental to the success of the battle of Shusha and in the war.[34]

In contrast to Azerbaijan's modernized approach, Armenia relied on traditional defensive strategies and static fortifications. While these methods had proven effective in the First Nagorno-Karabakh War, they were less suited to counter Azerbaijan's technological and tactical advancements in 2020. Armenia's armed forces consisted of approximately 45,000 active-duty personnel, supported by 200,000 reservists.[35] However, logistical constraints and the speed of Azerbaijan's advances limited Armenia's ability to mobilize its full force. In Shusha, an estimated 2,000–4,000 Armenian defenders comprising regular army units, local militias and volunteer fighters were present.[36] Despite their familiarity with the terrain, these forces lacked the training and equipment to sustain prolonged urban defensive operations.

A Bayraktar TB2 attack uncrewed air vehicle at the Victory Parade in Baku, December 10, 2020.

Source: Wikimedia E.Mirze

Armenia's arsenal was heavily reliant on Soviet-era systems, which faced significant limitations against Azerbaijan's advanced weaponry. Key assets included the following:

- Armour and artillery: Armenian forces deployed T-72 tanks and BMP-1/2 infantry fighting vehicles, along with D-30 howitzers and BM-21 Grad rocket launchers. While effective in static defence, these systems were highly vulnerable to Azerbaijan's UAVs and precision-guided munitions.[37]

- Air defence: Armenian systems like the 9K33 Osa and S-300 struggled to counter Azerbaijan's UAVs, leaving critical positions exposed.[38]

- Infantry equipment: Armenian infantry relied on AK-74 rifles, RPG-7 antitank weapons and limited night vision equipment, further constraining their effectiveness in urban combat.

Armenian forces depended heavily on Shusha's natural defences—its steep cliffs and narrow access routes. The city was fortified with entrenched positions, choke points and sniper nests designed to delay Azerbaijani advances. However, this static approach failed to account for Azerbaijan's ability to bypass traditional defences using unconventional routes and advanced technologies.

Armenian leadership faced significant challenges during the battle for Shusha. For instance, key commanders were absent or withdrew during critical phases of the fight and some troops reportedly refused to fight or deploy, thus undermining morale and cohesion.[39] Communication breakdowns and logistical issues further weakened Armenian defences and left many units isolated. Not disregarding the determination of local commanders and militias, the lack of centralized leadership proved costly.[40]

The opposing forces in Shusha displayed a sharp contrast in terms of military philosophy and capability. Azerbaijan's emphasis on modernization, technology, and leadership cohesion enabled it to execute a sophisticated campaign that overcame Shusha's formidable defences. Armenia, while fighting valiantly, was hindered by outdated strategies, logistical constraints and leadership failures.

BATTLE PROGRESSION: THE PATH TO SHUSHA

The campaign to capture Shusha was a detailed, planned and executed operation that combined technological superiority and tactical innovation of Azerbaijani forces. The journey from Hadrut to Shusha, approximately 30 kilometres of rugged terrain and fortified Armenian defences, presented initial and immense challenges. At the start of the war, the city's population was reported to be approximately 5,000 people, almost all ethnic Armenians.[41] The majority of civilian residents evacuated the city in order to avoid the impending battle, leaving only the military defenders.[42]

Shusha's natural geography has long made it a formidable defensive position. Situated atop steep cliffs and accessible only by narrow, winding roads, the city offers unparalleled defensive advantages to its occupants. The surrounding Karabakh mountains are densely forested, with treacherous ravines and rocky outcrops that complicate the movement of both infantry and armoured units. For Armenian forces, these features reinforced their confidence in Shusha's impregnability. However, they also created blind spots that Azerbaijani forces exploited.

Phase One: Securing the Southern Flank

The Azerbaijani campaign began with the capture of Hadrut in mid-October 2020, a pivotal moment in the broader war. Hadrut served as a staging ground for subsequent operations into the heart of Nagorno-Karabakh. Azerbaijani forces employed UAVs two devastating effect during this phase, using the Bayraktar TB2 and Harop UAVs to destroy Armenian artillery, disrupt supply lines and neutralize defensive positions.[43]

Following the capture of Hadrut, Azerbaijani troops advanced through the dense forests and narrow mountain passes, avoiding the heavily fortified highways that connected Armenian positions.[44] This approach minimized exposure to Armenian artillery but came at the cost of grueling marches through challenging terrain. Special operations forces spearheaded the advance, conducting reconnaissance and clearing obstacles ahead of the main force.[45]

The journey from Hadrut to Shusha was not without cost. Though outmatched technologically, Armenian forces still inflicted significant casualties through ambushes and defensive actions. Narrow mountain passes became killing zones where Armenian defenders targeted advancing Azerbaijani columns with small arms fire and rocket-propelled grenades.[46] Azerbaijani commanders responded by deploying UAVs for overhead surveillance, mitigating some of the risks posed by Armenian ambushes.[47]

Phase Two: Dashalti and the Approaches to Shusha

One of the most critical engagements in the campaign occurred in Dashalti, a village located just south of Shusha at the base of its cliffs. Dashalti was a defensive outpost for Armenian forces that was designed to block Azerbaijani advances into the city. With its narrow streets and elevated position, the village's terrain provided Armenian defenders with a strong tactical advantage.[48]

Azerbaijani forces launched a coordinated assault on Dashalti, combining UAV strikes with infantry attacks. The UAVs targeted Armenian reinforcements attempting to reach the village while Azerbaijani troops engaged in house-to-house combat to dislodge entrenched defenders. Despite fierce resistance, Dashalti fell after days of intense fighting and cleared the way for Azerbaijani forces to focus on Shusha itself.[49]

The battle for Dashalti was among the costliest engagements leading up to Shusha, with heavy losses on both sides. Armenian forces suffered from devastating UAV strikes, while Azerbaijani troops encountered stiff resistance during close quarters combat.[50] Notably, Dashalti's fall was a turning point, as it severed Armenian access to key supply routes and isolated Shusha's defenders.

Phase Three: The Cliffside Infiltration

The defining moment of the campaign was the infiltration of Azerbaijani special forces into the city by scaling Shusha's southeastern cliffs. Rising over 300 metres, these cliffs were considered impassable by Armenian defenders, who instead concentrated their fortifications along the main road. Azerbaijani commanders recognized this oversight and devised a bold plan to scale the cliffs under the cover of darkness.[51]

The operation to scale the cliffs was an extraordinary feat of physical endurance and tactical risk. According to Azerbaijan reports, approximately 400 Azerbaijani special forces soldiers, divided into four groups of 100, undertook this daring ascent under the cover of darkness.[52] Carrying minimal equipment to maintain speed and stealth while still having enough ammunition and anti-armour weapons to sustain themselves for the initial break-in, the teams used ropes and climbing gear to navigate the sheer cliffs surrounding the city.[53] Upon reaching the plateau, the special forces surprised and then defeated Armenian defensive positions, disrupting entrenched defensive lines and creating critical breaches.

Phase Four: The Urban Battle for Shusha

Fought from 6–9 November 2020, the urban battle for Shusha represented the climax of the Azerbaijani campaign to retake the city. It was a dramatic shift from manoeuvre warfare in rugged terrain to grueling close quarters combat within a densely fortified urban

environment. Shusha's narrow streets, fortified structures and natural defenses provided Armenian forces with significant tactical advantages, but Azerbaijani forces overcame these challenges through adaptability, tactical ingenuity and the use of advanced technology.

Following their daring cliffside infiltration, Azerbaijani SOFs established positions on Shusha's southeastern outskirts. This manoeuvre caught Armenian defenders off guard as their fortifications and troops were concentrated along the main southern approach to the city.

The first hours of the battle were marked by intense skirmishes as Azerbaijani troops engaged Armenian outposts and sniper positions. The rugged terrain and limited visibility provided cover for Azerbaijani forces but also slowed their progress. Armenian defenders used small arms, machine guns, and mortars in an attempt to soften the Azerbaijani lodgment, and then they launched counterattacks to dislodge the infiltrators. Azerbaijani units responded by using UAVs for real-time reconnaissance and deployed precision-guided munitions to neutralize fortified positions.[54]

Azerbaijani forces then pushed deeper into Shusha and targeted key defensive positions that anchored Armenian resistance. One of the most fiercely contested sites was the Shusha prison complex, located near the southeastern cliffs. Armenian forces had fortified the prison, using its thick walls and elevated vantage points to create a stronghold.[55] The assault on the prison was another defining moment of the urban battle. Azerbaijani special forces launched a coordinated attack, employing grenades, mortars and antitank guided missiles to breach the structure's defences.[56] Close quarter combat then ensued as Azerbaijani troops cleared the prison room by room, encountering stiff resistance from Armenian defenders. The capture of the prison enabled Azerbaijani forces to secure the southeastern sector of the city and establish a staging ground for logistical resupply and further advances into the urban core. This success disrupted Armenian command and control within Shusha, further demoralizing their forces.

As Azerbaijani troops moved beyond the prison, the battle devolved into house-to-house combat. The narrow streets and densely packed buildings forced both sides to rely on infantry tactics and portable weaponry. Azerbaijani forces employed "hugging the enemy" techniques, engaging at close range to minimize the effectiveness of Armenian artillery and mortar fire.

Armenian defenders attempted to delay the Azerbaijani advance by relying on sniper nests and barricades. Improvised explosive devices and booby traps added to the challenges faced by Azerbaijani troops, who countered these threats with methodical clearing operations.[57] Portable antitank weapons such as RPG-7s proved critical in neutralizing Armenian vehicles and fortified positions.

On 7 November, dense fog blanketed Shusha, temporarily grounding Azerbaijani UAVs and reducing visibility for both sides. This pause in aerial operations provided Armenian forces with a brief opportunity to regroup and launch counterattacks.[58] The Armenian reinforcements included T-72 tanks and BMP-2 infantry fighting vehicles, and these counterattacks were aimed at retaking key positions in the city's southeastern quadrant.[59] The confined urban environment amplified the effectiveness of these armoured assaults and forced Azerbaijani troops to rely on portable antitank weapons and ambush tactics. Despite consolidated effort and favourable weather, the counterattacks faltered because of poor coordination and sustained Azerbaijani resistance.

By 8 November, Azerbaijani forces had gained control of key infrastructure, including the Shusha Executive Power building.[60] This marked the beginning of the final phase of the battle, as Armenian defences began to collapse under sustained pressure. The fight for the city centre involved intense clearing operations, with Azerbaijani troops systematically neutralizing remaining Armenian strongholds. They employed grenades, breaching charges and close quarter weapons to dislodge defenders from fortified positions. Armenian resistance was determined but became increasingly fragmented and many units retreated or surrendered. As Azerbaijani forces consolidated their control over Shusha and continued resupply efforts, remaining Armenian defenders began a disorganized withdrawal toward the Lachin corridor. However, Azerbaijani advances along the surrounding routes made escape increasingly difficult, resulting in significant Armenian casualties and prisoner captures.[61]

On 9 November, Azerbaijani President Ilham Aliyev announced the complete liberation of Shusha, asserting total victory in the city.[62] While Armenian officials initially denied this claim, the following day Armenian Prime Minister Nikol Pashinyan signed a peace agreement under unfavourable terms.[63] The deal included the surrender of all territories in Nagorno-Karabakh captured by Azerbaijani forces during the conflict, including Shusha.[64]

The urban battle for Shusha was a small part of the broader dynamics of the 2020 Nagorno-Karabakh War, but it was decisive. It showcased the importance of urban terrain, the challenges of urban warfare, the importance of adaptability and the decisive role of technology in modern conflicts. Azerbaijani forces demonstrated a combination of technological innovation, tactical creativity and leadership to overcome Shusha's formidable defenses. For Armenia, the loss of Shusha was a devastating blow, symbolizing the

collapse of their campaign and the vulnerabilities of their static defensive strategies. The fall of Shusha compelled Armenia to agree to a ceasefire, which effectively ended the war. For Azerbaijan, it was not only a military victory but also a symbolic restoration of national pride, reshaping the geopolitical landscape of the South Caucasus.[65]

LESSONS IDENTIFIED FROM THE BATTLE OF SHUSHA

The battle of Shusha offers profound insights for military planners, strategists and leaders grappling with the complexities of urban warfare in the 21st century. The confluence of advanced technology, challenging terrain and intense urban combat during the battle underscored the need for adaptability, innovation and a deep understanding of the operational environment. The lessons that can be extracted from the Battle of Shusha are not confined to the South Caucasus and have broader implications for urban warfare worldwide.

1. Urban Centres as Strategic Objectives

Urban centres such as Shusha are not merely tactical objectives but hold immense strategic, cultural and symbolic value. For Azerbaijan, Shusha represented the reclamation of lost sovereignty and a cultural renaissance. Its strategic location, which overlooked Stepanakert and the Lachin corridor, made it vital for controlling Nagorno-Karabakh. For Armenia, defending Shusha was existential, given its role as a cornerstone of their presence in the region. This dynamic reinforces the importance of prioritizing urban centres in military planning. Simply put, controlling such cities can decisively shift the balance of a conflict.

2. Leveraging Technological Superiority

The extensive use of UAVs by Azerbaijani forces during the campaign proved to be transformative. UAVs such as the Bayraktar TB2 provided real-time intelligence, targeted precision strikes, and disrupted Armenian logistics. The Harop loitering munitions neutralized entrenched positions with efficiency and rendered traditional air defences less effective. This technological edge allowed Azerbaijan to systematically degrade Armenian defences before engaging in ground combat.

However, the battle also exposed the limitations of technology. The dense fog on 7 November grounded Azerbaijan's UAVs, forcing troops to adapt without aerial support. This underscores the need for forces to balance reliance on technology with proficiency in conventional tactics. Militaries must invest in UAVs as well as counter-UAV capabilities while ensuring redundancy in operations to mitigate technological vulnerabilities.

3. Terrain Exploitation and Tactical Innovation

The Azerbaijani cliffside infiltration exemplifies the power of innovative thinking in overcoming seemingly insurmountable obstacles. Shusha's natural defences, including its 300-metre-high cliffs, were regarded as impregnable, which led the Armenian defenders to focus on the southern approaches to the city instead. Exploiting this oversight, Azerbaijani special forces scaled the cliffs under cover of darkness to launch surprise attacks on Armenian positions.

This manoeuvre demonstrates the importance of thorough terrain analysis and creative problem-solving in military operations. It also highlights the vulnerabilities of static defenses even in urban areas. Relying solely on natural or constructed barriers without accounting for adversarial adaptability can lead to catastrophic outcomes. Commanders must constantly reassess assumptions about terrain and identify opportunities for surprise.

4. The Challenges of Urban Combat

Urban warfare remains one of the most complex and resource-intensive forms of conflict. The battle for Shusha underscored these challenges, with its house-to-house fighting, use of improvised explosive devices and dense infrastructure, which considerably limited mobility. Azerbaijan's forces had to adapt quickly, which required employing small-unit tactics and leveraging close-range engagements to neutralize Armenian defenders.

For Armenian forces, urban combat posed a different set of challenges. Their reliance on static defences, lack of contingency planning and limited mobility made it difficult to respond to Azerbaijani advances. As seen in Shusha, defending forces in urban areas must balance fortifications with the ability to manoeuvre and adapt to evolving threats.

Urban combat also places immense psychological strain on soldiers. The claustrophobic environment, the constant threat of ambush, the exhaustion emanating from close combat fights, and the proximity to civilian structures demand extraordinary discipline and resilience. These factors must be integrated into training and operational planning.

5. Leadership as a Force Multiplier

Effective leadership was a decisive factor in the battle of Shusha. Azerbaijani commanders demonstrated operational flexibility, integrating UAVs with ground operations and adjusting tactics as the battle evolved. The ability of commanders, staff and the forces to constantly adapt was critical in maintaining momentum during the urban phase of the campaign.

In contrast, Armenian leadership faced significant challenges. Reports of absent commanders, communication breakdowns and logistical failures undermined Armenian defenses.[66] The demoralized troops and the lack of unified decision-making accelerated the collapse of resistance in Shusha.

Leadership remains one of the most critical determinants of success in urban warfare. Commanders must foster adaptability, maintain morale and ensure effective communication under the most challenging conditions.

6. The Role of Logistics in Urban Operations
The ability to sustain operations in urban environments depends heavily on robust logistical support. Despite the challenges of mountainous terrain and contested supply lines, Azerbaijani forces effectively delivered reinforcements, ammunition and medical care to frontline units.[67] This logistical resilience was instrumental in maintaining operational tempo and overcoming Armenian defences.

Conversely, Armenian forces in Shusha faced severe logistical constraints. Azerbaijani advances disrupted supply lines, leaving defenders isolated and under-equipped. This lack of logistical support contributed to the collapse of Armenian resistance.

The lessons of Shusha align with those of historical battles like Stalingrad (1942–1943) and Mosul (2016–2017), where logistics played a pivotal role in sustaining combat operations. Militaries must prioritize logistical planning and redundancy to ensure resilience in prolonged urban engagements.

7. Symbolism and the Psychological Dimension
The symbolic and psychological aspects of Shusha were as important strategically as the tactical and operational dimensions. For Azerbaijan, retaking Shusha was framed as a national redemption, restoring sovereignty over a cultural heartland. This narrative galvanized Azerbaijani troops and sustained public support for the campaign.[68] For Armenia, the loss of Shusha was devastating both militarily and emotionally. It shattered the perception of Nagorno-Karabakh as an impregnable stronghold and undermined morale among Armenian forces and civilians.

The psychological dimension of urban warfare cannot be overstated. Maintaining morale, managing expectations and shaping narratives are critical components of success. Commanders must account for these factors when planning and executing operations.

CONCLUSION: INSIGHTS FOR FUTURE CONFLICTS

The battle of Shusha offers a compelling case study to extract lessons that resonate far beyond the South Caucasus. It underscores the evolving nature of urban warfare and the increasing demand it places on the forces. The complex and multifaceted nature of urban warfare is heavily shaped by the confluence of technology, terrain, training, leadership and adaptability. Urban centres like Shusha, with their strategic, cultural, and symbolic significance, are no longer just tactical objectives but critical centres that can determine the trajectory and outcome of conflicts. As noted in the article, the innovative use of UAVs and creative exploitation of terrain by Azerbaijani forces, combined with effective leadership and logistical resilience, were crucial in overcoming formidable obstacles. At the same time, the battle revealed the drawbacks of depending too heavily on technology and the challenges of static defences. Furthermore, the collapse of Armenian resistance was not only a result of subpar military tactics and an inability to modernize or adapt, but also the erosion of morale and leadership.

As urban warfare continues to shape future conflicts, understanding and integrating these lessons will be crucial for success in the future land operating environment. For military planners and strategists worldwide, Shusha stands as a testament to the complexity of modern warfare and the critical need for forces to be flexible, resilient, and capable of navigating the complex dimensions of urban combat.

ABOUT THE AUTHOR

John Spencer is chair of urban warfare studies at the Modern War Institute and codirector of its Urban Warfare Project, and he is the host of the Urban Warfare Project Podcast. He served twenty-five years as an infantry soldier, which included two combat tours in Iraq. He is the author of the books *Connected Soldiers: Life, Leadership, and Social Connections in Modern War*, *∑The Mini-Manual for the Urban Defender*, and he is coauthor of *Understanding Urban Warfare*.

ENDNOTES

1. S. E. Cornell, *Small Nations and Great Powers: A Study of Ethnopolitical Conflict in the Caucasus* (London: Routledge Publishing, 2001), 76–82.

2. C. J. Walker, *Armenia: The Survival of a Nation* (London: Routledge Publishing, 1991), 185–190.

3. Aida Huseynova, *Music of Azerbaijan: From Mugham to Opera* (Bloomington: Indiana University Press, 2016), 34–29.

4. T. De Waal, *Black Garden: Armenia and Azerbaijan Through Peace and War*, 2nd ed. (New York: New York University Press, 2013), 65–70.

5. John Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War," *Modern War Institute*, 14 July 2021, https://mwi.westpoint.edu/the-battle-of-shusha-city-and-the-missed-lessons-of-the-2020-nagorno-karabakh-war.

6. "Holy All Savior Ghazanchetsots Church in Shushi," *Monument Watch,* accessed 9 December 2024, https://monumentwatch.org/en/monument/holy-all-savior-ghazanchetsots-church-in-shushi/.

7. C. Zurcher, *The Post-Soviet Wars: Rebellion, Ethnic Conflict, and Nationhood in the Caucasus* (New York: New York University Press, 2007), 112–118.

8. S. T. Hunter, *The Transcaucasus in Transition: Nation-Building and Conflict* (Washington, D.C.: CSIS Press, 2017), 123–130.

9. De Waal, *Black Garden*, 245–250.

10. "History of Shusha," *Shusha City official website*, accessed 9 December 2024, https://shusha.gov.az/en/susa-trxi.

11. Ibid.

12. Walker, *Armenia*, 185–190.

13. A. L. Altstadt, *The Azerbaijani Turks: Power and Identity Under Russian Rule* (Stanford: Hoover Institution Press, 2016), 210–215.

14. Zurcher, *The Post-Soviet Wars*, 112–118.

15. Cornell, *Small Nations and Great Powers*, 128–132.

16. Ibid., 145–150.

17. De Waal, *Black Garden*, 245–250.

18. Ibid., 185–190.

19. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

20. Cornell, *Small Nations and Great Powers*, 198–202.

21. "Karabakh's Latest Cycle of Displacement," *Eurasianet*, accessed 9 December 2024, https://eurasianet.org/karabakhs-latest-cycle-of-displacement.

22. "Shusha: Azerbaijan's Cultural Capital and the Heart of the Nagorno-Karabakh Conflict," *Time*, accessed 9 December 2024, https://time.com/6208925/shusha-nagorno-karabakh-azerbaijan-capital/.

23. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

24. "Israeli Weapons Quietly Helped Azerbaijan Retake Nagorno-Karabakh: Sources, Data," *Times of Israel*, 8 November 2020, https://www.timesofisrael.com/israeli-weapons-quietly-helped-azerbaijan-retake-nagorno-karabakh-sources-data/.

25. Ryan Brennan, "A Failure to Innovate: The Second Nagorno-Karabakh War," *Parameters* 52, No. 1 (2022): 67–80, https://press.armywarcollege.edu/parameters/vol52/iss1/10/.

26. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

27. "Azerbaijan's Unifying Role in Turkish-Israeli Relations," *Endowment for Middle East Truth (EMET)*, 12 October 2020, https://emetonline.org/azerbaijans-unifying-role-in-turkish-israeli-relations/.

28. Cornell, *Small Nations and Great Powers*, 145–150.

29. Altstadt, *The Azerbaijani Turks*, 210–215.

30. Royal Air Force, "The Role of Airpower in Contemporary Conflict," *Centre for Air and Space Power Studies* 25, No. 2/3 (2023), https://www.raf.mod.uk/what-we-do/centre-for-air-and-space-power-studies/aspr/aspr-vol25-iss2-3-pdf/.

31. Edward J. Erickson, "The 44-Day War: Observations and Lessons from the Azerbaijani Victory over Armenia in the Second Nagorno-Karabakh War," *Military Review Online Exclusive*, U.S. Army, 2021, https://www.armyupress.army.mil/Portals/7/military-review/img/Online-Exclusive/2021/erickson/Erickson-the-44-day-war.pdf.

32. Jamestown Foundation, "Azerbaijan, Turkey Hold Large-Scale Military Drills Amidst Escalation of Tensions with Armenia," *Eurasia Daily Monitor*, 29 July 2020, https://jamestown.org/program/azerbaijan-turkey-hold-large-scale-military-drills-amidst-escalation-of-tensions-with-armenia/.

33. Office of the President of Azerbaijan, "President Ilham Aliyev: The Patriotic War for the Liberation of Azerbaijani Lands," *official website of the President of Azerbaijan*, 8 November 2020, https://president.az/en/articles/view/44435.

34. "President Ilham Aliyev Congratulates 1st Army Corps Commander Hikmet Hasanov on Liberation of Madagiz from Occupation," *APA News*, 3 October 2020, https://apa.az/en/domestic-news/President-Ilham-Aliyev-congratulates-1st-Army-Corps-Commander-Hikmet-Hasanov-on-liberation-of-Madagiz-from-occupation-331987; "Azerbaijani President Awards Defence Minister, Two More Senior Military Officers," *Defence.az*, 25 June 2018, https://archive.ph/20210104143151/http://defence.az/en/news/128326/azerbaijani-president-awards-defence-minister,-two-more-senior-military-officers.

35. U.S. Army, *Nagorno-Karabakh 2020 Conflict Catalog*, Army Futures Command, August 2021, https://api.army.mil/e2/c/downloads/2023/01/31/693ac148/21-655-nagorno-karabakh-2020-conflict-catalog-aug-21-public.pdf.

36. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

37. Missile Defense Project (website), "The Air and Missile War in Nagorno-Karabakh: Lessons for the Future of Strike and

Defense," *Center for Strategic and International Studies (CSIS)*, 9 December 2020, https://www.csis.org/analysis/air-and-missile-war-nagorno-karabakh-lessons-future-strike-and-defense.

38. "Israeli-Made 'Suicide Drones' Help Azerbaijan Destroy Armenian Targets in Karabakh," *Middle East Eye*, 29 October 2020, https://www.middleeasteye.net/news/azerbaijan-armenia-russia-israel-suicide-drones-destroy.

39. "Why Was the War Lost in Karabakh? Samvel Babayan's Revelations from the 44-Day War," *Hyetert*, 14 December 2020, https://hyetert.org/2020/12/14/why-was-the-war-lost-in-karabakh-samvel-babayans-revelations-from-the-44-day-war/; Cornell, *Small Nations and Great Powers*, 76–82.

40. De Waal, *Black Garden*, 65–70.

41. Timothy Lister, "War Tips in Favour of Azerbaijan as Army Captures Key Town in Nagorno-Karabakh," *The Telegraph* 8 November 2020, https://www.telegraph.co.uk/news/2020/11/08/war-tips-favour-azerbaijan-army-captures-key-town-nagorno-karabakh/.

42. "The Battle for Shusha," *Meduza*, 7 November 2020, https://meduza.io/en/feature/2020/11/07/the-battle-for-shusha.

43. "Four Years Pass Since Liberation of Hadrut Town," *Report.az*, 9 October 2024, https://report.az/en/karabakh/four-years-pass-since-liberation-of-hadrut-town/.

44. "A Unique Military Operation to Liberate Dashalti and Shusha in November 2020," *Azerbaijan Today*, 20 November 2021, https://azerbaijantoday.az/2021/11/20/a-unique-military-operation-to-liberate-dashalti-shusha-in-november-2020/.

45. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

46. U.S. Army, *Nagorno-Karabakh 2020 Conflict Catalog*.

47. Missile Defense Project, "The Air and Missile War in Nagorno-Karabakh."

48. "31 Years Pass Since Operation in Dashalti Village," *Report.az*, 26 January 2023, https://report.az/en/karabakh/31-years-pass-since-operation-in-dashalti-village/.

49. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

50. Meduza, "The Battle for Shusha."

51. De Waal, *Black Garden*, 245–250.

52. "A Unique Military Operation to Liberate Dashalti and Shusha in November 2020," *Azerbaijan Today*, 20 November 2021, https://azerbaijantoday.az/2021/11/20/a-unique-military-operation-to-liberate-dashalti-shusha-in-november-2020/.

53. "Victory in the Patriotic War: The Liberation of Shusha," *Azerbaijan.az*, November 2020, https://azerbaijan.az/en/related-information/304.

54. "Why Drones Turned the Tide for Azerbaijan: An Analysis," *Vivekananda International Foundation*, 4 December 2020, https://www.vifindia.org/article/2020/december/04/why-drones-turned-the-tide-for-azerbaijan-an-analysis.

55. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

56. Ibid.

57. "Booby Traps Are Being Neutralized in the Karabakh Region of Azerbaijan," *Ministry of Defense of Azerbaijan*, accessed 9 December 2024, https://mod.gov.az/en/news/booby-traps-are-being-neutralized-in-the-karabakh-region-of-azerbaijan-video-49587.html.

58. Jeffrey Borsuk, "The Role of UAVs in the Battle for Shusha," *Military Strategy and Tactics Journal* 35, No. 4 (2021): 12–28, https://www.jstor.org/stable/48638213?seq=2.

59. Spencer, "The Battle of Shusha City and the Missed Lessons of the 2020 Nagorno-Karabakh War."

60. Ibid.

61. Azerbaijan Today, "A Unique Military Operation to Liberate Dashalti and Shusha in November 2020."

62. Ibid.

63. Meduza, "The Battle for Shusha."

64. "Azerbaijan Leads the Turkic World Into a New Era of Synergy and Development – Analysis," *Eurasia Review*, 11 July 2024, https://www.eurasiareview.com/11072024-azerbaijan-leads-the-turkic-world-into-a-new-era-of-synergy-and-development-analysis/.

65. Ibid.

66. Hyetert, "Why Was the War Lost in Karabakh?"

67. Brennan, "A Failure to Innovate."

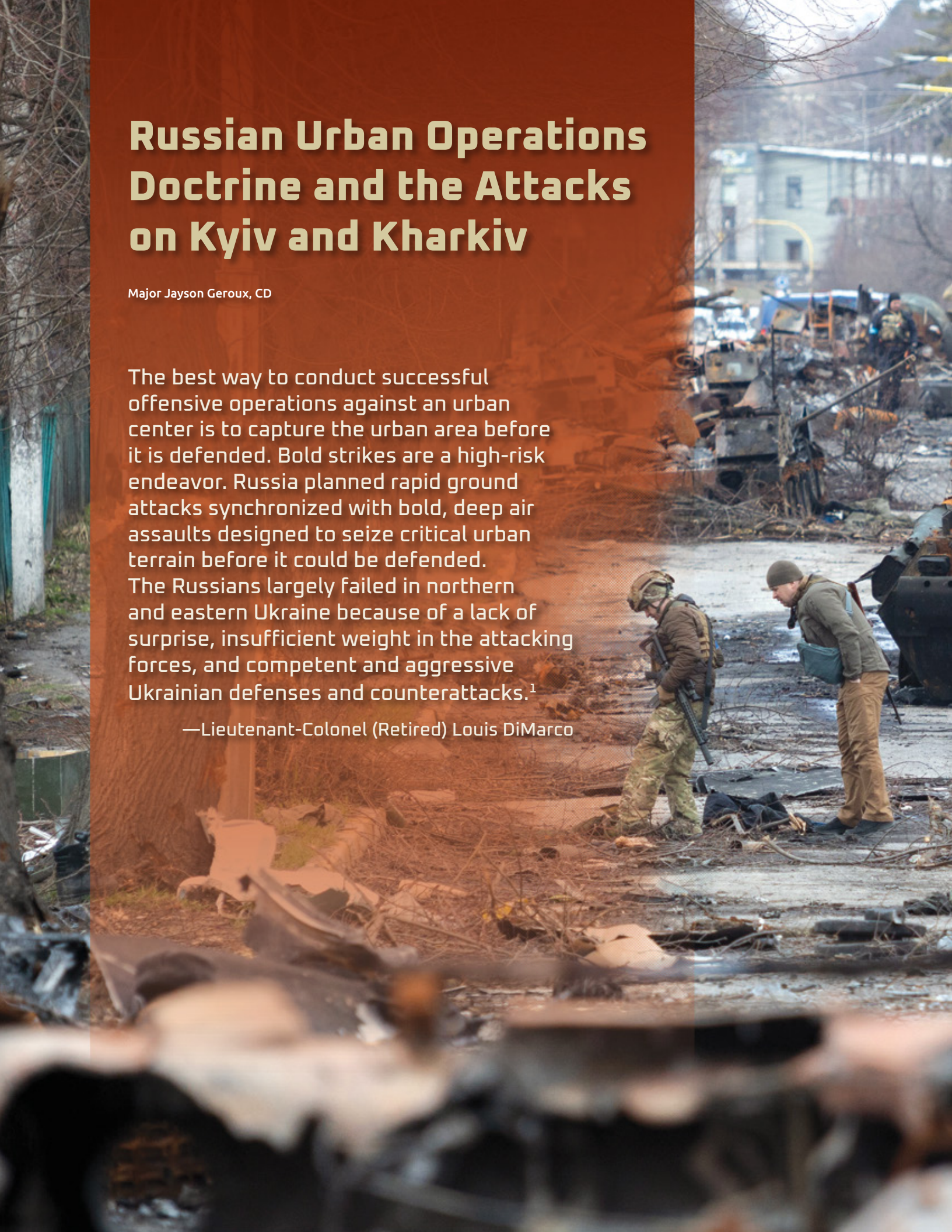
68. "Shusha's Significance for Azerbaijan: President Aliyev's Call for Regional Stability," *Caliber.az*, 8 November 2022, https://caliber.az/en/post/shusha-s-significance-for-azerbaijan-president-aliyev-s-call-for-regional-stability/.

Russian Urban Operations Doctrine and the Attacks on Kyiv and Kharkiv

Major Jayson Geroux, CD

The best way to conduct successful offensive operations against an urban center is to capture the urban area before it is defended. Bold strikes are a high-risk endeavor. Russia planned rapid ground attacks synchronized with bold, deep air assaults designed to seize critical urban terrain before it could be defended. The Russians largely failed in northern and eastern Ukraine because of a lack of surprise, insufficient weight in the attacking forces, and competent and aggressive Ukrainian defenses and counterattacks.[1]

—Lieutenant-Colonel (Retired) Louis DiMarco



In the early years of the 21st century, Russia claimed that a majority of Ukrainians wanted to be brought into the Russian fold due to Ukraine's purportedly weak government and its alleged cultural acceptance of right-wing extremism. Those alleged reasons were sufficient for the Kremlin to justify the use of force against Ukraine, although it was clear that Russia's intent was to destroy Ukraine's national sovereignty and its military to reap the benefits of Ukraine's defence and nuclear industries.[2] The process of subsuming Ukraine began in 2014 with Russia's illegal annexation of the Crimea and Donbas regions, which was followed in the next few years by occasional but intensely violent clashes. For several weeks in 2021–2022, Russia amassed its military forces on both its and Belarus's borders with Ukraine, demonstrating that Russian President Vladimir Putin wanted to finish what he had started and that an attack on Ukraine was imminent.

This article will discuss Soviet/Russian urban operations doctrine at the operational and tactical levels to provide the background, then briefly identify some of the many reasons why the initial Kyiv and Kharkiv attacks were unsuccessful and explore how Russian urban operations doctrine was misapplied when the Russians attempted to take the two cities in the opening days of the war. This case study will also serve as the basis for a discussion of the lessons learned from urban warfare history in general and how choosing to selectively ignore one's own military history in particular and/or not adjusting urban operations doctrine overall to the situation on the ground can be fatal to an operational plan and to the soldiers executing that plan at the tactical level.[3]

BACKGROUND

Before the Russian re-invasion of Ukraine in February 2022, there was intense speculation and debate among scholars and military specialists the world over about Russia's possible intent and most likely scheme of manoeuvre. Opinions varied on the size and scope of the possible future operation, with some experts warning that the buildup of forces on Ukraine's north, east and southeast borders was a precursor to a full-scale invasion. One analysis predicted that Russian forces would advance all the way to Ukraine's western borders with Poland, Slovenia, Hungary and Romania.[4] Alternative perspectives suggested that perhaps the units in Belarus were only a demonstration intended to compel the Ukrainians to place more of their military forces close to and within their capital city. That, in turn, would allow the Russians to face fewer Ukrainian units in the Donbas. As Kyiv would be too challenging an objective to capture, the demonstration in the north would enable Russia to conduct a larger incursion to finally secure the east and allow it to finish what it had begun in 2014.[5] A myriad of other courses of action between these two were also discussed. However, all predictions about Russia's invasion stated that Ukraine's

cities would be strategic objectives. To reinforce that point, media articles were accompanied by maps with huge, sweeping red arrows, most of which pointed to Ukraine's principal urban areas, including Kyiv, Kharkiv, Kherson, Odesa, Mariupol, Donetsk and/or Luhansk.

The Russian intent was made clear when the world awoke on 24 February 2022 to the news that Russia had crossed Ukraine's borders in an all-out invasion. The large red arrows on the maps were replaced with red stains that indicated how far Russian combined air and ground forces had penetrated into the country. Prominent among them—and quite worrisome to most Ukrainians and the West—was the airmobile operation by the *Vozdushno-desantnye voyska Rossii* (VDV), the Russian airborne forces, to secure critical airports located close to Kyiv, in particular the Antonov International Airport in Hostomel, northwest of the city.[6] Also worrisome were the ground columns that appeared to be moving quickly towards Kyiv and Kharkiv, which were only 150 kilometres and 42 kilometres from the Russian border respectively and thus within relatively easy striking distance. If the airport could be secured and if Kyiv, Ukraine's capital city, fell, the war could be over within days of its start. Kyiv also presented a set of valuable logistics hubs, including ports on the Dnipro River, several airports and a complex network of railroads and highways which linked Ukraine with Russia and Belarus.[7] Its capture would allow Russia to build up the supplies needed to run rampant throughout the country. If Kharkiv was also taken quickly, Ukraine's two largest cities would have fallen.

The Russians seemed to be following an urban operations pre-emption doctrine that had often proven successful throughout their military history. Based on Soviet/Russian doctrine, at the beginning of an invasion a well-armed force would be dispatched to an unprepared and poorly defended enemy capital city, gain lodgement in the suburbs, then immediately and quickly advance into the centre of the city to arrest or destroy the seats of power. That forces an early capitulation of the country as a whole and swiftly ends the conventional portion of the conflict.[8] Afterwards, a proxy government would be established to take control of the country. For the first few days of the war, the Russian seizure of Ukraine's airport and the columns bearing down on the capital city and also Kharkiv suggested that this doctrine was being followed—and that it was going to be successful.

We now know that the Ukrainians were able to stymie the VDV's Antonov Airport attacks.[9] The ground columns that had penetrated into Kyiv and Kharkiv were stopped, and those penetrations were destroyed almost as quickly as the Russians entered the two cities.[10] Instead of making a doctrinal, rapid advance to the cities' centres to decapitate various levels of the Ukrainian government, the Russian columns moved sluggishly, with dismounted soldiers beside or following slow-moving armoured vehicles as they crawled in single file through the suburb of Bucha, just northwest of Kyiv. Other videos showed the same lethargic method in Kharkiv. In both cities, the Ukrainians were able to respond, overwhelming and destroying the columns.[11] They then conducted shaping operations externally and northwest of Kyiv in particular, destroyed a number of bridges and opened a series of dams to flood the land. This forced the Russians to advance into narrow choke points where their columns were ambushed by the Ukrainians.[12] Thus, the Russians were forced to try to envelop Ukraine's urban areas, especially Kyiv, with greater forces. Massed fires from two artillery brigades blunted the advance towards Ukraine's capital and saved the city—and the country—from an early capitulation.[13] Similar Russian manoeuvres in the eastern, southern and southeastern portions of the country were met with more success: the Russians occupied cities such as Kherson and Melitopol, where there was little to no defensive action.[14]

Scholars and military analysts were soon noting the many faults of the Russian operational-level plan in general. Those knowledgeable about urban warfare in particular echoed DiMarco's comments above and commented caustically on the initial Russian actions at the operational and tactical levels—specifically, sending lone columns into Kyiv and Kharkiv with what appeared to be only lightly armoured vehicles and dismounted infantry employing improper tactics, techniques and procedures (TTP). The analysts were correct in noting those failings. The Russians appeared to have ignored key precepts in their own and other armies' doctrine, ones whose relevance has been demonstrated repeatedly in urban warfare history. At the operational level, doctrinal publications have frequently stated that failure to isolate an urban area before entering it will only prolong a battle and cause more casualties for the attacker. At the tactical level, the attack must be conducted by a combined arms force made up of armour, infantry, artillery and engineers who form a symbiotic relationship of mutual support and protection as they advance through and attack to methodically clear a city's streets.

Why, then, did the Russians apply such risky operational schemes of manoeuvre and tactics in Kyiv and Kharkiv? They did so largely because their established urban operations doctrine that discusses these particular methods had previously resulted in operational successes, and the doctrine itself worked more often than not. However, the key to doctrine is knowing when it will or will not be successful: militaries must be nested in doctrine, not wedded to it, and they must know when to divorce from it. However, I am not suggesting that Russian urban operations doctrine is flawed and that it was the only reason for the failure of the Kyiv and Kharkiv attacks, as it is well known that when military operations fail, it is usually for multiple reasons.

SOVIET/RUSSIAN URBAN OPERATIONS DOCTRINE

In general, the West's military doctrine still follows the practices that evolved and were established during the Second World War (1939–1945), given that it remains the largest modern military peer-on-peer conflict in human history. Similarly, Russian military doctrine, including that of urban operations, is founded on Soviet doctrine that was developed during and after the same conflict. If one considers the Russians to be the inheritors of Soviet experience, it can be argued that the number and scale of their urban operations during and since the Second World War has provided them with a great deal of involvement in contested urban operations in the 20th and 21st centuries. In particular, the former Soviet Union and present-day Russia have had a history of offensive urban warfare experience, which leading Russian military scholar Dr. Lester Grau has—in a nod to the title of Sergio Leone's 1966 film—broken into three categories:

1. **The good:** Stalingrad (1942–1943), Minsk (1944), Vienna (1945), Prague (1968), Kabul (1979), Herat (1984), Baku (1988–1989), Grozny (1999–2000), Simferopol (2014);

2. **The bad:** Kiev (1943), Warsaw (1944), Budapest (1944–1945), Berlin (1945), East Berlin (1953), Aleppo (2017); and

3. **The ugly:** Budapest (1956), Grozny (1994–1995), and twice in Grozny (1996).

As Grau points out, in all these cases but the two 1996 battles in Grozny, the Russians won.[15] However, as his categorization implies, despite having an abundance of urban warfare experience, the Russians paid a high price for those victories.

This vast urban operations history—which involved fighting a conventional peer-on-peer adversary during the Second World War (1939–1945) and less-powerful countries and/or smaller grouped asymmetric enemies during the Cold War—has been combined with the standard Russian emphasis on artillery, rockets and missiles, which have traditionally remained the central focus of their doctrine.[16] This, in turn, has developed an offensive urban operations doctrinal mindset that had and continues to have some similarities but also some stark differences that Western urban operations doctrinal practitioners will readily identify.

In the doctrinal planning stage of Soviet offensive urban operations, regiments coordinated the attacks while battalions executed them. Battalion commanders and their staffs conducted their own battle procedure that focused on central planning but decentralized execution, ensuring a combined arms scheme of manoeuvre with indirect fires such as artillery and mortars, with close air support that was also held at their level. Battalions were named "assault detachments" and companies "assault groups." An assault group was a motorized rifle company with one or two tank platoons, anti-tank guns, an artillery battery in the direct fire role, a combat engineer platoon, a "flamethrower" (the Russian term for a thermobaric weapon) and/or chemical, biological, radioactive and nuclear specialists, all in support. An intelligence preparation of the urban environment was supported by an intelligence, surveillance and reconnaissance soak of the urban area. Enemy positions external and internal to the city—in particular, strongpoints; command, control and communications centres; reserve unit locations; enemy withdrawal units; and successive defensive positions in the latter—were to be identified.[17]

In the execution stage, Soviet doctrinal practice was to employ a particular scheme of manoeuvre called "from the march" to take the city.[18] A first echelon main force would bypass a city altogether and continue advancing, leaving a second echelon to surround the urban area. The second echelon would then effectively isolate the city physically and/or with firepower. With that isolation achieved, the second echelon would execute frontal and rear attacks against the outskirts/suburbs of the city to hold opposing forces in place. One or more combined arms, forward detachment assault groups would then conduct the "from the march" method—and it is here that Soviet and Western doctrine differed—by pushing one or more columns, each on its own axis of advance, without pause into the city centre, swiftly bypassing enemy positions to seize critical bridges, junctions and installations en route and eventually the government buildings in the downtown core.[19] If the column or columns could move quickly enough before the enemy had a chance to establish a coordinated defence, the seizure of critical points allowed for freedom of manoeuvre for follow-on forces and could possibly enable the Soviet forces to topple the local government, establish order and move on.[20] While the column or columns were conducting their "from the march" manoeuvre and moving into the city centre, other assault groups in the urban area's outskirts or suburbs would conduct reconnaissance by battle, probing the city to determine further enemy positions. Withdrawal routes out of the city were to be blocked by armour and/or airborne elements. Engineer detachments were to build obstacles to further block withdrawal routes and protect the assault groups' flanks.[21]

However, what if the defenders were to conduct a spirited defence that did not allow the columns to achieve success when attempting their swift "from the march" movement into the downtown core? If that was the case, then at least the Soviet forces would already hold critical manoeuvre points within the city that would allow follow-on assault detachments to conduct an easier, methodical, block-by-block clearing of the urban area with their assault groups to eventually gain victory. If this latter scheme of

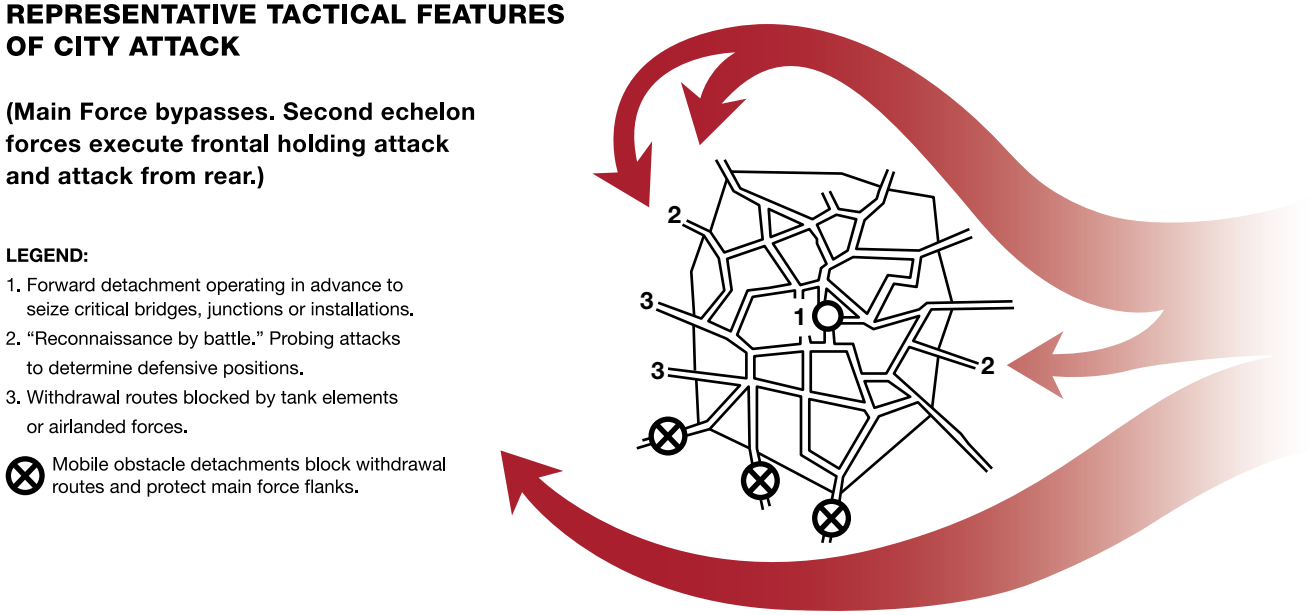


Figure 1: The Soviet scheme of manoeuvre for attacking a city "from the march."[22]

manoeuvre of clearing the city in its entirety had to be carried out, then the Soviet offensive doctrine looked similar to Western doctrine, with the initial use of the Soviet mainstay—indirect artillery fire, rockets, bombs and missiles—against urban targets both on the outskirts and in depth. Combined arms assault groups would then move forward in a symbiotic relationship of protection using close air support, indirect wand direct fire artillery, mortars, infantry, tanks and engineers to clear rooms, buildings, blocks, suburbs and eventually the entire city.[23]

Russian urban operations practitioners later adjusted the sequence of the "from the march" method to exploit increasing artillery capabilities. Again, the Russian doctrinal focus on artillery and other fires is intended to suppress and then destroy both the city's outskirts and in-depth positions first:

> Artillery plays the most important role in capturing a city on the march. It participates in fire escort of first-echelon units, suppresses and destroys the enemy in strong points on the outskirts of the city. The tactical maneuver of combat artillery crews with the attacking subunits approaching the city is the successive transfer of fire on buildings and structures in the depths of the defense and the prohibition of the approach of enemy reserves to the attacked objects.[24]

As the artillery was completing its task, forces were to seize just a suburb to affect the breaking-in and gain lodgement in the city, but without initially isolating the entire urban area. This is different from the Soviet doctrine discussed above, in which the isolation was completed before this step. Then, the "from the march" penetration into the downtown core is executed. If that penetration does not succeed, it is only then that the complete isolation is conducted and a deliberate, block-by-block takedown of the city occurs:

> According to the canons of tactics, the capture of the city and other settlements is carried out, as a rule, on the march. In this case, the first is the destruction of the enemy on the outskirts of the city. Then the motorized rifle battalion breaks into it and unceasingly develops its actions in depth. If the capture of the settlement on the march fails, by decision of the senior commander, its encirclement (blocking) is organized, and after comprehensive preparation, the assault and mastery of it by the troops begins.[25]

It is apparent that the "from the march" method, regardless of where it falls in the Soviet or Russian sequences, entails a great deal of risk and that most Western military commanders would be loath to execute. There would be a justifiable fear that bypassing enemy positions and advancing into the heart of the city would result in friendly forces eventually being surrounded by a quick-reacting adversary, entailing considerable friendly casualties and losses in combat power. However, if the column(s) can quickly move into the city's centre and subdue the government, that ends the conventional conflict immediately or perhaps initiates only a small insurgency afterwards. Unlike most Western military commanders, Soviet commanders were, and Russian commanders are,

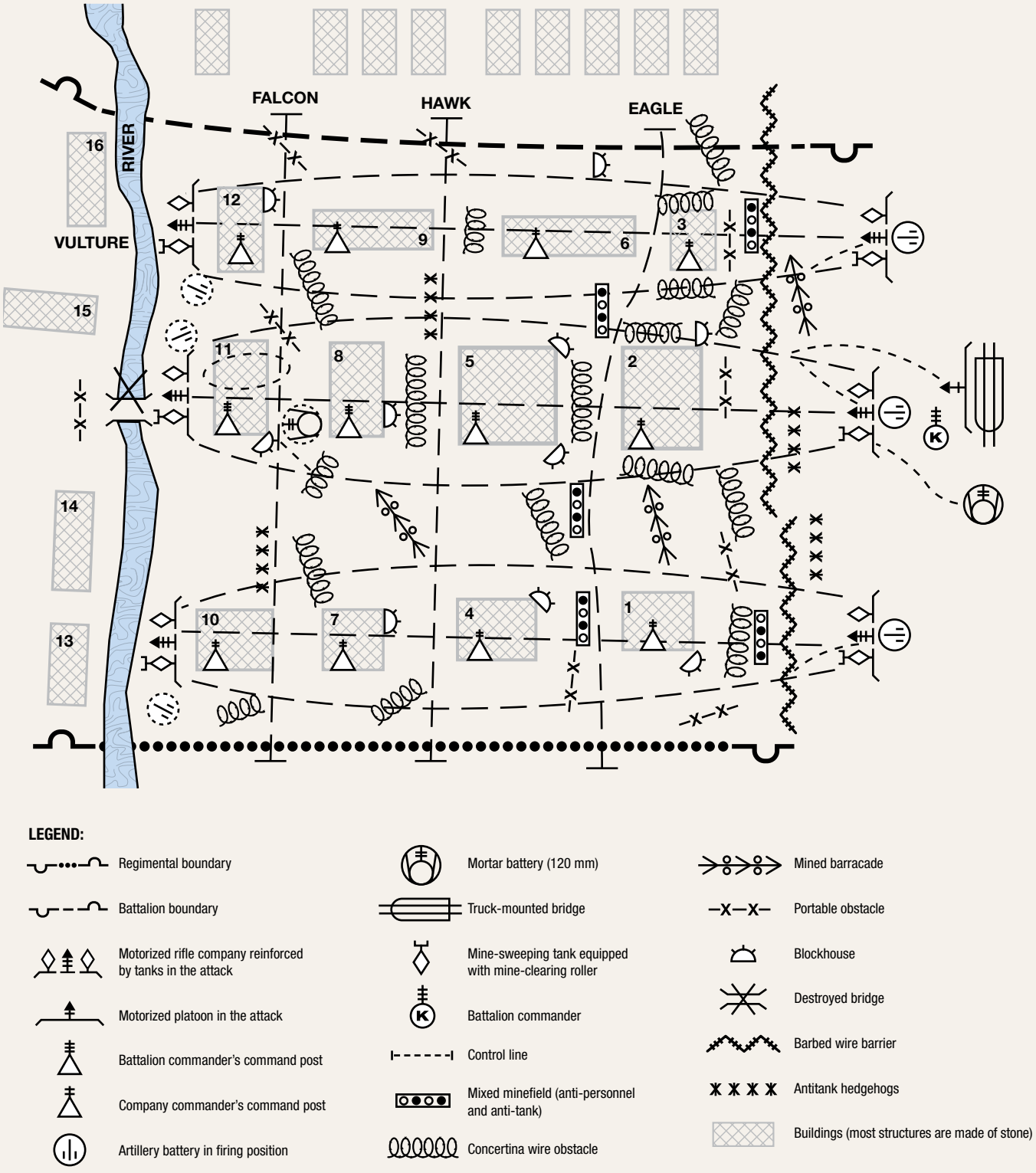


Figure 2: The Soviet combined arms, deliberate block-by-block clearance of the city using an assault detachment with three assault groups.[26]

The remains of the VDV armoured column that was destroyed on Vokzalnaya Street, Bucha.

The first phase of any urban offensive operation is the isolation of the city or parts of it physically and/or with firepower and/or on the electromagnetic spectrum, in order to prevent the defenders from receiving reinforcements and resupply and to interfere with their ability to communicate.

more than willing to take this risk. Also, given that the Soviet and then Russian military often fought less-powerful countries and/or smaller grouped asymmetric enemies during the Cold War, such a risky method could be, and was, employed successfully multiple times, although, as rightly noted by Grau, it always ended up being good, bad or ugly. Other countries have also tried this method. For instance, North Vietnam's Spring Offensive throughout South Vietnam in 1975 colourfully named their "from the march" method the "Blooming Lotus," whereby multiple cities' perimeter defences were bypassed and fast-moving units drove into city centres, where they attacked and destroyed critical command and control nodes. With that task completed, forces then turned around and began attacking outward.[27] The American penchant for more aggressive colloquial names had them conducting a similar "from the march" scheme of manoeuvre with their "thunder runs" into downtown Baghdad, Iraq, in March 2003.[28]

THE ATTACKS ON KYIV/KHARKIV

In urban operations, airports and seaports are critical logistics hubs and are always high on a priority list for capture. Thus, it was hardly a surprise when on the morning of 24 February 2022, the Russians attacked Antonov International Airport in Hostomel, approximately 20 kilometres northwest of Kyiv. They carried out four missile strikes in and around the airport, then the VDV's 31st Guards Air Assault Brigade and the 45th Separate Guards Spetsnaz Brigade were airlifted in two waves of approximately 34 Mi-8 "Hip" transport helicopters carrying 200–300 soldiers, with Kamov Ka-52 "Alligator" and Mi-24 "Hind" gunship helicopters in support.

Two of the helicopters were downed en route, and the Ukrainian soldiers of the 4th Rapid Reaction Brigade—only 200 of them, as the rest of the unit had been deployed to the east in expectation of attacks there—were on the alert due to the earlier missile strikes. The Russian helicopters were met with ZU-23 anti-aircraft gunfire and an SA-24 surface-to-air missile system, which downed one of the Ka-52s. The Russians were still able to land the Mi-8 "Hip" transport helicopters to allow airborne soldiers to dismount and, after an hour-long fight, the Ukrainian defenders withdrew when they began to run low on ammunition. In order to prevent the use of the runway, two of the Ukrainian brigade's D30 artillery guns fired on it in an attempt to crater it. Allegedly, there were dozens of Ilyushin Il-76 transport aircraft en route to the airport to discharge anywhere from 1,000 to 5,000 additional soldiers and their equipment. However, those aircraft aborted their mission, more than likely because of the ongoing fighting and artillery striking the runway. A larger Ukrainian counterattack force was cobbled together from the 80th Air Assault Brigade, the 95th Air Assault Brigade, the 72nd Mechanized Brigade and the 3rd Special Purpose Regiment of the Special Operations Forces. With air support from Ukrainian SU-24 fighter-bombers and artillery, the Ukrainians attacked the airport at 1730 hours.[29] The VDV's Chief of Staff, Major-General Andrei Sukhovetsky, was killed during the fighting, and the Russian paratroopers were pushed off the airport's property by 2100 hours. The Chief of Staff's presence at Antonov airport demonstrates how important it was to the Russians that the opening portion of the operation succeed.[30] Due to the large ground force that was approaching, Ukrainian forces withdrew again after further attempts to damage the runway to prevent aircraft from landing on it. That withdrawal enabled the VDV, together with mechanized units that had arrived as a result of the advance from Belarus, to retake the airport on the morning of 25 February. On 28 February, the Ukrainians—more than likely understanding the danger of allowing the Russians to retain the airport—once again counterattacked and temporarily recaptured it.[31] Fighting in and around the airport continued for several days, until 3 March 2022.[32] As long as the Ukrainians contested or held the airport, they were denying the Russians the ability to airlift more forces into it and impeded the Russian intent to allow those airlifted forces to attack Kyiv in greater numbers.

As the fighting wavered at Antonov Airport in the initial days of the invasion, the Russian columns that had arrived at the airport bore down on Kyiv and Kharkiv as those cities were battered. It is worth reiterating that this is a standard practice in Soviet/Russian doctrine, with heavy use of artillery, rockets, missiles and air strikes.[33] At the operational level, the Russians were employing their "from the march" method—which had been successfully conducted several times throughout Soviet/Russian history—in an attempt to enable their forces to swiftly bypass Ukrainian

Source: Twitter

Screenshot of a video taken by a Ukrainian resident showing Russian advances into Kharkiv.[34]

defences, reach Kyiv's downtown core and capture the government buildings and the senior political leaders in order to force the country to capitulate.[35] However, on the evening of 25–26 February 2022, as the VDV column with its small armoured personnel carriers made its way south on Vokzalnaya Street's narrow two-lane road through the Kyiv suburb of Bucha, it was intercepted and ambushed by a Ukrainian force equipped with Next-generation Light Antitank Weapons and possible support from Bayraktar uncrewed aircraft.[36] The classic ambush tactic was employed: strike the lead and rear vehicles and destroy them in order to trap all of the vehicles and personnel in between, which were then easy pickings as they had no way to escape.[37] On 27 February 2022, Bucha's mayor, Anatoli Fedoruk, posted a video on social media of dozens of burned-out and smoking Russian military vehicles on that stretch of road.[38]

In Kharkiv, a number of columns attempted to enter the city "from the march" on 27 February 2022: one from the southeast along Heroiv Kharkova Avenue, one from the northeast along Shevchenka Street and one from the northwest along Akhsarova Street.[39] In a video taken by a local Ukrainian resident and posted on social media, one Russian column consisting of GAZ Tigr 4×4 multipurpose all-terrain infantry mobility vehicles with dismounted soldiers following on either side or behind the vehicles crept its way through Kharkiv's streets in an almost breathtaking demonstration of failed urban warfare tactics. Instead of the dismounted soldiers walking well ahead of the vehicles, to ensure that the vehicles could not be destroyed and could provide fire support to the dismounted soldiers, symbiotically providing protection for both, the Russians instead just walked slowly behind and on either side of the vehicles, allowing both to be susceptible to enemy fire.

Given these tactics, there was little surprise when news stories with photos and videos from Kharkiv were similar to the ones from Bucha, showing bodies and destroyed Russian vehicles in the streets. Evidently, the "from the march" method had not worked in either city. The reasons for that involve both the psychological and physical planes of war. In retrospect, it is clear that the Russian intelligence preparation of the overall environment in general and the urban context in particular was not carried out as thoroughly as it should have been. That was likely due to the assumption that Ukraine would be easy to take, as some other countries had been in the Soviet Union's/Russia's past.

That failure of intelligence preparation had a number of cascading negative effects. One was not detecting the Ukrainian reaction to the invasion itself. As DiMarco states, the months-long buildup of Russian forces outside of the country ensured that Russia lost the element of surprise while Ukraine and its people—senior political leaders, regular force military, territorial defence units and civilians—gained it. They had the time not only to prepare to face the invaders but also to mount a spirited defence, shocking not only the Russians but the entire world.

Also, a good intelligence preparation of the urban environment and a review of urban warfare history would have deduced a number of necessities, but that information was lacking due to Russia's erroneous belief that Ukraine's capitulation was going to be a mere matter of marching. In the urban operations context, the attacker-to-defender force ratio was clearly too low, for a number of reasons. The first was the size of the cities themselves, in terms of both population and physical footprint. Kyiv's 3.5 million people and 839 square kilometres and Kharkiv's 1.2 million people and 350 square kilometres rival other cities such as Berlin, Manila, Seoul, Baghdad and Mosul that have suffered from past urban operations. The battles in those cities are considered to be the most significant in urban warfare history due to the scale of the forces committed to their attack or defence.[40]

The first phase of any urban offensive operation is the isolation of the city or parts of it physically and/or with firepower and/or on the electromagnetic spectrum, in order to prevent the defenders from receiving reinforcements and resupply and to interfere with their ability to communicate.[41] The physical size of Kyiv and Kharkiv—and/or even their extensive suburbs—would have arguably meant that a majority of the dozens of battalion tactical groups involved in the entire invasion would have been needed just to isolate the two cities, with more needed to accomplish the breaking-in, gaining lodgement and eventual clearance. A 3:1 ratio is the standard for offensive operations in non-urban environments, but Canadian, British and American urban operations doctrine publications categorically state that due to the multiplicity of factors to be considered in urban operations, force ratios ranging from 6:1 to 15:1 are needed, although that must be considered as a start state because the ratios could be higher or lower.[42] All of this meant that the Russians needed to commit considerably larger forces than they had originally tasked if Kyiv and Kharkiv were to be taken. On top of that, a good intelligence preparation of the urban environment in particular would have deduced that Russian forces across the board had very little in the way of urban operations training.[43] Given that urban environments are the most complex, the Russians could have conducted that type of training as a concurrent activity before the buildup or while it was occurring.

However, very little of the above was considered, reviewed, deduced and/or done. Instead, the Russians fell back onto their doctrine, which became an additional reason why their attacks on Kyiv and Kharkiv failed. Had all of the above-mentioned factors been taken into consideration—and it is fair to be critical "after the fact" here because Soviet/Russian urban warfare history had already demonstrated those factors a number of times—then Russian doctrine could have been reviewed and deductions made to adjust it to fit the situation. The Russians had only to return to those "bad" or "ugly" examples of Berlin 1945 and Grozny 1994–1995, given how well known those urban battles have become and because the Russians had employed the "from the march" method on multiple axes into those cities. As in Kyiv and Kharkiv, the Russian columns in Berlin and Grozny were ambushed and destroyed by small groups of aggressive German and Chechen defenders respectively. The Russians could have deduced that the Ukrainians were going to mount a spirited defence in their cities and that it would be too strong for the Russians to handle.[44] Better preparation would also have determined that the "from the march" method would not work and that other courses of action such as the use of their mainstay, fires; the isolation of the cities' suburbs to conduct a "bite and hold" method; and/or a block-by-block clearance would have to be pursued.[45] That would have also revealed the need for resources that they did not have. Although they would have realized that they needed considerably more time to take Kyiv and Kharkiv, they could have recognized those factors *before* they launched the invasion and created mitigations to meet their higher commander's intent. However, in the leadup to the invasion of Ukraine, that thinking did not occur: the Russians merely fell back on the "from the march" doctrinal method of sending columns into Kyiv and Kharkiv to try to force an early capitulation of Ukraine's government.

Given the above-mentioned intelligence that was not conducted and the factors that were not considered, the "from the march" doctrinal method was doomed to failure in both cities even before it was initiated. To compound the situation, the Russians realized only after the failure of

the "from the march" method that a slow, time-consuming, resource-intensive method of taking the cities was required for success. However, by then they had already begun the invasion, and forces would need to be pushed towards Kyiv and Kharkiv for that success to occur. Given that they were spread so thin in the northern, eastern and southern parts of Ukraine—together with the Ukrainian plan of flooding the land and creating choke points to channel the additional columns into ambush areas—that was impossible to achieve.

CONCLUSION

Did the Russians learn from their many operational failures in general and the misapplication of their urban operations doctrine, in particular their "from the march" attacks on Kyiv and Kharkiv? It appears that they did not do so immediately. In Grau and Bartles' article in this edition of CAJ, they review a translated article originally written by Colonel A. Kondrashov and LCol D. Tanenya and featured in the Russian Ministry of Defence's premier journal *Armeiskii sbornik* (Army Digest). In the article, "Combat in a City," the two Russian senior officers discuss urban operations lessons learned, but the focus is on Ukrainian TTP. There is no discussion at all of Russian TTP. Although "Combat in a City" was not meant as a Russian doctrinal review, it is nevertheless curious that an article focused on urban warfare lessons learned soon after the invasion began did not discuss the initial Russian failures in Kyiv and Kharkiv.[46]

Many factors contributed to Russia's initial failures in the early days of the invasion of Ukraine, both at the operational level overall and in urban operations in particular.[47] To name a few: the lack of surprise due to a buildup of forces over several months; the insufficient weight in the attacking forces due to the three large northern, eastern and southern front lines that stretched over 2,500 kilometres; the failure of Russian logistics to support it all; a lack of urban operations training; poor application of urban TTP; and the lack of an appropriate intelligence preparation of the battlefield that would have revealed that the Ukrainians were planning a vigorous defence. We must also add to this list the failure at the operational level due to the misapplication of the "from the march" doctrinal method.

This is not to suggest that if the Russians had reviewed trends in urban warfare history, had been rigorous in reviewing their own urban operations lessons learned from past conflicts, and had amended their urban operations doctrine, they would have been successful in Kyiv and Kharkiv. Regardless of whether they had done those things or not, all of the above operational-level faults would have still made it incredibly challenging for the Russians to take the two cities, especially given the Ukrainians' swift and strong response and their ability to defend their homeland. The Russians needed to conduct a more thorough intelligence preparation of the battlefield to understand the enemy they were about to face. They also needed to review trends in urban warfare history and their own urban operations history. If they had done so, they could have adjusted their urban operations doctrine and created a more viable operational plan that attempted to affect the isolation of those cities. They would have also understood that they needed considerably more time and resources to achieve their strategic objectives in capturing Kyiv and Kharkiv and could have done so with considerably fewer casualties.

ACKNOWLEDGEMENTS

The author is indebted to Dr. Aditi Malhotra, LCol (Ret'd) Les Grau, LCol Chuck Bartles, John Spencer, LCol (Ret'd) Charles Knight and Mr. Stuart Lyle for their review of this article and their suggestions.

ABOUT THE AUTHOR

Major Jayson Geroux is an infantry officer with The Royal Canadian Regiment and at the time of writing was with the Canadian Army Doctrine and Training Centre. He is an urban operations instructor who has participated in, planned, executed and taught the subject internationally. Major Geroux is also a passionate military historian who has researched, written and published several urban warfare case studies and has been the keynote speaker at several international urban operations–related conferences. He received his M.A. from the Brigadier Milton Gregg VC Centre for the Study of War and Society at the University of New Brunswick, where his thesis focused on the urban battle of Ortona, Italy (20–27 December 1943) during the Second World War (1939–1945).

ENDNOTES

1. LCol (Ret'd) Louis DiMarco, "Urban Operations in Ukraine: Size, Ratios, and the Principles of War," *Modern War Institute at West Point, Urban Warfare Project*, 20 June 2022, https://mwi.usma.edu/urban-operations-in-ukraine-size-ratios-and-the-principles-of-war/.

2. Mykhaylo Zabrodskyi, Jack Watling, Oleksandr V. Danylyuk and Nick Reynolds, *Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February-July 2022* (London: Royal United Services Institute for Defence and Security Studies, 2022), 11.

3. Due to space constraints, this article focuses on Russia's offensive urban operations doctrines during the early weeks of the Russo–Ukrainian War, comparing them to the events of February-March 2022.

4. Seth G. Jones, "Russia's Possible Invasion of Ukraine," *Centre for Strategic and International Studies*, 13 January 2022, https://www.csis.org/analysis/russias-possible-invasion-ukraine.

5. Luke Harding and Dan Sabbagh, "Focused Russian Attack on Ukraine Seen as More Likely Than Full-Scale Invasion," *The Guardian*, 26 January 2022, https://www.theguardian.com/world/2022/jan/26/focused-russian-attack-on-ukraine-seen-as-more-likely-than-full-scale-invasion.

6. Mason Clark, George Barros and Kateryna Stepanenko, "Russia Ukraine Warning Update: Initial Russian Campaign Assessment" (Institute for the Study of War, 24 February 2022), https://www.understandingwar.org/backgrounder/russia-ukraine-warning-update-initial-russian-offensive-campaign-assessment. Early reporting during the war identified airports near Kyiv which had allegedly been attacked: the Boryspil International Airport southeast of Kyiv and Vasylkiv Airport to the city's southwest. Some of these early reports were erroneous: Boryspil Airport was not attacked at all. https://www.dailysabah.com/world/europe/ukraine-recaptures-key-kyiv-suburb-amid-massive-destruction-by-russia and https://www.theguardian.com/world/2022/feb/28/vasylkiv-why-this-small-ukrainian-town-is-now-a-big-russian-target.

7. Amos Fox, "The Russo-Ukrainian War and the Principles of Urban Operations," *Small Wars Journal*, 10 November 2022, https://smallwarsjournal.com/jrnl/art/russo-ukrainian-war-and-principles-urban-operations.

8. LCol (Ret'd) Lester W. Grau, "Attacking in a City: The Russian Motorized Rifle Battalion Approach," *Infantry* 107, no. 1 (January–March 2018) [Fort Benning: U.S. Army Infantry School, 2018], 15, https://www.benning.army.mil/infantry/magazine/issues/2018/Jan-Mar/PDF/Jan-Mar18_InfMag.pdf.

9. Andrew McGregor, "Russian Airborne Disaster at Hostomel Airport," *Aberfoyle International Security*, 08 March 2022, https://www.aberfoylesecurity.com/?p=4812.

10. Amos Fox, "Reflections on Russia's 2022 Invasion of Ukraine: Combined Arms Warfare, the Battalion Tactical Group and Wars in a Fishbowl" (Association of the United States Army, 29 September 2022), https://www.ausa.org/publications/reflections-russias-2022-invasion-ukraine-combined-arms-warfare-battalion-tactical.

11. Dimarco, "Urban Operations in Ukraine"; Asher McShane, "Russian Convoy Blitzed Near Kyiv by Ukrainian Troops Armed with Brit Anti-Tank Weapons," *Leading Britain's Conversation*, 02 March 2022, https://www.lbc.co.uk/news/russian-convoy-blitzed-by-ukrainian-troops-armed-with-brit-anti-tank-weapons/.

12. John Spencer and Liam Collins, "Waterworld: How Ukraine Flooded Three Rivers to Help Save Kyiv," *Modern War Institute of West Point*, *Urban Warfare Project*, 01 July 2022, https://mwi.usma.edu/waterworld-how-ukraine-flooded-three-rivers-to-help-save-kyiv/.

13. Zabrodskyi, Watling, Danylyuk and Reynolds, *Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine*, February-July 2022, 2.

14. Fox, "Reflections on Russia's 2022 Invasion of Ukraine," https://www.ausa.org/publications/reflections-russias-2022-invasion-ukraine-combined-arms-warfare-battalion-tactical.

15. Grau, "Attacking in a City," 15, https://www.benning.army.mil/infantry/magazine/issues/2018/Jan-Mar/PDF/Jan-Mar18_InfMag.pdf.

16. LCol (Ret'd) Lester Grau and LCol Charles K. Bartles mention the word "artillery" 639 times in their 402-page document *The Russian Way of War: Force Structure, Tactics, and Modernization of the Russian Ground Forces* (Fort Leavenworth, TX: Foreign Military Studies Office, 2017), 233–234.

17. Field Manual 100-2-2, *The Soviet Army: Specialized Warfare and Rear Area Support* (Washington, D.C.: Headquarters of the Army, 1984), 54–55, 57.

18. Grau, "Attacking in a City," 15, https://www.moore.army.mil/infantry/magazine/issues/2018/Jan-Mar/PDF/Jan-Mar18_InfMag.pdf.

19. FM 100-2-2, *The Soviet Army*, 54; and Grau, "Attacking in a City," 15, https://www.moore.army.mil/infantry/magazine/issues/2018/Jan-Mar/PDF/Jan-Mar18_InfMag.pdf.

20. Grau, "Attacking in a City," 15, https://www.moore.army.mil/infantry/magazine/issues/2018/Jan-Mar/PDF/Jan-Mar18_InfMag.pdf.

21. FM 100-2-2, *The Soviet Army*, 54; and Grau, "Attacking in a City," 15, https://www.benning.army.mil/infantry/magazine/issues/2018/Jan-Mar/PDF/Jan-Mar18_InfMag.pdf.

22. FM 100-2-2, *The Soviet Army*, 54 (diagram and narrative).

23. Ibid., 57.

24. D. Epifanov, "Storming the City is Fine Matter," *Armeiskii sbornik* (Army Digest), 31 January 2017, 26.

25. Ibid., 25.

26. Ibid., 56 (diagram and narrative).

27. Canadian Armed Forces Army Lessons Learned Centre, *Dispatches: Lessons Learned for Soldiers – Training for Urban Operations* (Kingston: Army Publishing Office, 2002), 6.

28. These "thunder runs" are discussed in great detail in David Zucchino, *Thunder Run: The Armored Strike to Capture Baghdad* (New York: Grove Press Publishing, 2004).

29. Richard James Sladden, Liam Collins and Alfred Connable, "The Battle of Irpin River: February-March 2022," *The British Army Review*, Issue 187 (Spring 2024), (Sandhurst: Centre for Historical Analysis and Conflict Research, 2024), 17–21.

30. McGregor, "Russian Airborne Disaster at Hostomel Airport," https://www.aberfoylesecurity.com/?p=4812; Zabrodskyi, Watling, Danylyuk and Reynolds, *Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February-July 2022*, 26. In discussion with Lester Grau, personal communication: "Russian officers commonly go far forward on reconnaissance and lead from the front in assaults. They suffer higher senior officer casualties than other armies as a result. Recce and leading from the front ensures that the attack commander understands the commander's intent from both seeing the ground and ensures that the plan is being followed during its implementation."

31. Mason Clark, George Barros, and Kateryna Stepanenko, "Russian Offensive Campaign Assessment, February 28 2022" (Institute for the Study of War, 28 February 2022), https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-february-28-2022.

32. McGregor, "Russian Airborne Disaster at Hostomel Airport," https://www.aberfoylesecurity.com/?p=4812.

33. Shashank Bengali and Marc Santora, "Ukrainian Officials Report Missile Attacks in Kyiv," *New York Times*, 24 February 2022, https://www.nytimes.com/live/2022/02/24/world/russia-attacks-ukraine as quoted in Fox, "Reflections on Russia's 2022 Invasion of Ukraine," https://www.ausa.org/publications/reflections-russias-2022-invasion-ukraine-combined-arms-warfare-battalion-tactical. Twitter @ViralShid, https://twitter.com/ViralShid/status/1498156793637265410.

34. Twitter @ViralShid, https://twitter.com/ViralShid/status/1498156793637265410.

35. Mason Clark, George Barros and Katya Stepanenko, "Russia-Ukraine Warning Update: Russian Offensive Campaign Assessment, February 26" (Institute for the Study of War, February 26, 2022), https://www.understandingwar.org/backgrounder/russia-ukraine-warning-update-russian-offensive-campaign-assessment-february-26.

36. DiMarco, "Urban Operations in Ukraine: Size, Ratios, and the Principles of War," https://mwi.usma.edu/urban-operations-in-ukraine-size-ratios-and-the-principles-of-war/; Bowen, "Ukraine War: Bucha Street Littered with Burned-out Tanks and Corpses," *British Broadcasting Corporation News*, 3 April 2022, https://www.bbc.com/news/world-europe-60970818.

37. Bowen, "Ukraine War: Bucha Street Littered with Burned-out Tanks and Corpses," https://www.bbc.com/news/world-europe-60970818.

38. Зла Бандерівка@zvirytko on Twitter, as embedded in Asher McShane, "Russian Convoy Blitzed Near Kyiv by Ukrainian Troops 'Armed With Brit Anti-Tank Weapons,'" *Leading Britain's Conversation* news (website), https://www.lbc.co.uk/news/russian-convoy-blitzed-by-ukrainian-troops-armed-with-brit-anti-tank-weapons/.

39. Twitter @Reptilien31, https://twitter.com/Reptilien31/status/1497876455828639748.

40. As noted by DiMarco in "Urban Operations in Ukraine: Size, Ratios, and the Principles of War."

41. North Atlantic Treaty Organization, *NATO Standard, ATP-99, Urban Tactics* (Brussels: NATO Standardization Office, 2016), 4-5–4-13.

42. These force ratios are from the following doctrinal publications: Canada's B-GL-322-007-FP-001, *Unique Operations – Urban*; the United Kingdom's *Operations in the Urban Environment*; and the United States of America's joint U.S. Army/U.S. Marine Corps ATP 3-06/MCTP 12-10B, *Urban Operations*.

43. Michael Kofman with John Spencer, "Russia, Ukraine and Urban Warfare," minutes 16:20 to 19:13, *Modern War Institute at West Point*, 19 August 2022, https://mwi.usma.edu/russia-ukraine-and-urban-warfare/.

44. Antony Beevor, *The Fall of Berlin 1945* (New York: Penguin Books, 2002); and Olga Oliker, *Russia's Chechen Wars 1994-2000: Lessons from Urban Combat* (Santa Monica: The RAND Corporation, 2001), 12–16.

45. DiMarco, "Urban Operations in Ukraine: Size, Ratios, and the Principles of War."

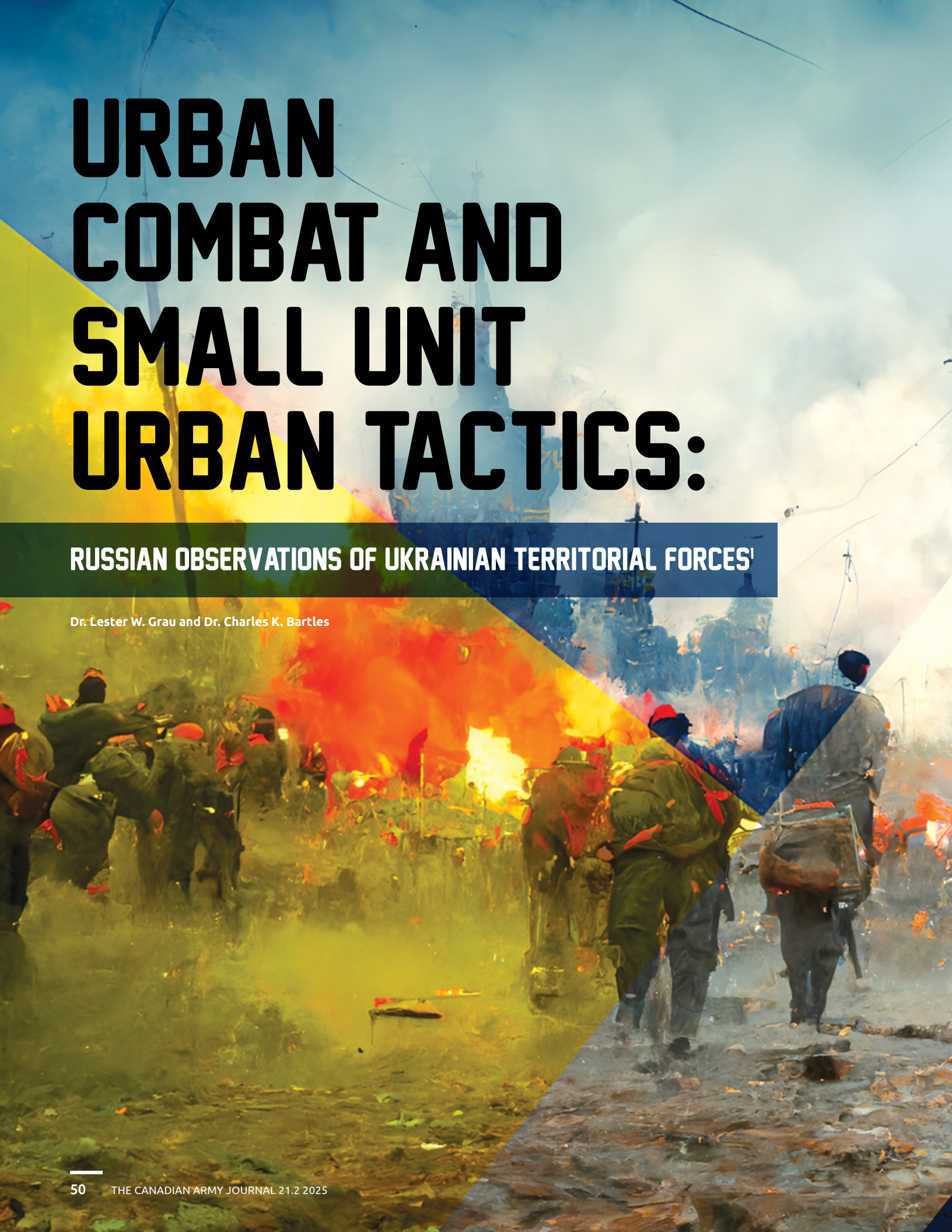
46. Lester Grau and Charles Bartles, "Russian View of Combat in Cities and Small-Unit Tactics of Territorial Forces in Ukraine," *Canadian Army Journal* 20, no. 2 (2024): 36–51.

47. Zabrodskyi, Watling, Danylyuk and Reynolds, *Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February-July 2022* is recommended for its in-depth analysis which includes discussion of the multiple causes.

URBAN COMBAT AND SMALL UNIT URBAN TACTICS:

RUSSIAN OBSERVATIONS OF UKRAINIAN TERRITORIAL FORCES[1]

Dr. Lester W. Grau and Dr. Charles K. Bartles



INTRODUCTION

Only two months after Russia's "special military operation" began in Ukraine in 2022, the Russian Ministry of Defence's publishing house released an issue of its premier journal, *Армейский Сборник* [*Army Digest*], catering to the operational-level readership. Particularly noteworthy is that the issue contains authoritative articles dealing with the kind of fighting the Russians are currently encountering in Ukraine. This was a more rapid dissemination of published information than is usual for the Russian military, which tends to be deliberative in what it puts in front of its soldiers and officers. Although "Combat in a City," by Colonel A. Kondrashov and Lieutenant Colonel D. Tanenya, certainly depicts the adversary Russia is currently facing without naming it, much of the information in the article was also likely derived from Russia's experience fighting in Chechnya, Syria and eastern Ukraine prior to the current conflict. The article presents an open-source Russian view of fighting in built-up areas and a detailed description of territorial and irregular forces. It is a quick-turn, lessons-identified piece for the Russian Armed Forces. On the other hand, it is not meant to be Russian doctrine and it does not account for all of the Russian or Ukrainian military tactics used or all of the events that have occurred. However, one point that would not escape the notice of the Russian military readership is the thin disguise of locally established Ukrainian units, such as Territorial Defence Brigades, Special Tasks Patrol Police and other indigenous volunteer units as the featured foe in "Combat in the City." The article examines in detail how Russia experiences combat against what it terms "illegal armed formations" (IAF), referring to Ukrainian fighters/territorial forces, and highlights its encounters with the enemy (Ukraine) in urban warfare. The analysis of the enemy by a combined arms commander is challenging, since the commander must determine the size, tactics and capabilities of the IAFs.

IMPRESSIONS FROM "COMBAT IN A CITY" BY KONDRASHOV AND TANENYA

Organization of the Fight

Compared to Russia's earlier military actions in Afghanistan, Chechnya and Syria, their "special military operation" in Ukraine is up against a better-organized and more heavily armed enemy. Combat in built-up areas is especially complex. Urban combat requires detailed preparation, dictated by the multi-storey nature of the city, thorough understanding of the enemy, and identification of the enemy's strong and weak points and its vital critical objectives—all of which determine success in the battle.[2] Commanders, staff and combatants require persistence, patience, skill, initiative, non-standard approaches, energy and decisiveness.

The Russian forces report that in the ongoing urban combat in Ukraine they are fighting irregular "territorial battalions" that combine the tactics of diversionary terrorists with those of traditional urban combat. The enemy [Ukrainians] differs from the regular force in organization and lacks a standard table of organization and equipment. The size of the force may vary from a few dozen to several thousand personnel. Contemporary Russian combat experience indicates that enemy forces often start as disorganized groups of 60 to 100 personnel, armed mainly with rifles but also with modern weapons like shoulder-fired air defence missiles, machine guns, rocket-propelled grenades, antitank grenade launchers, recoilless rifles, mines and even tanks and *Boyevaya Mashina Pekhoty* (BMP) [Soviet/Russian infantry fighting vehicles]. These groups typically set up block posts at key access points to urban areas, with around 10 to 15 personnel stationed at each critical post. The block posts usually feature an 82 mm or 120 mm mortar and one or two pickup trucks outfitted with heavy machine guns, SPG-9 recoilless rifles or antitank guided missiles.

On the outskirts of the city, the enemy positions tanks, BMPs and the ZSU 23-4 "Shilka" four-barrelled air defence machine gun or artillery pieces firing in the direct fire role. Inside the city, most armoured vehicles (tanks and BMPs) are deployed within city blocks to defend command posts, ammunition dumps and weaponry, as well as manoeuvre routes and machine shops that produce improvised explosive devices and repair equipment. These vehicles also protect training sites, field hospitals, trial courts and prisons.[3]

Based on Russian experience, an enemy IAF initially defends a city using a static positional defence before shifting to a manoeuvre defence.[4] It mines key buildings up to two or three blocks deep from the line of expected conflict. To slow the tempo of the advancing forces, it employs massed fire from various weapons, conducts counterattacks, and sets up "fire sacs" and ambushes. As a rule, the defence is organized in a single echelon with a reserve. The system of coordinated fires, engineering obstacles, and the capability to quickly deploy combat power on various axes demands particular attention. Debris from shattered buildings can block critical routes of approach and intersections, with obstacles reaching heights of up to five metres.

On the outskirts of the populated area, the enemy prepares antitank ditches and embankments, often using bulldozers (armoured or unarmoured) for this type of work. Firing positions are prepared on the ground floor of buildings, and boxes of rocks and sandbags fortify those positions. Walls, reinforced with boxes of rocks and sandbags, conceal and protect movement between buildings, while basement shelters shield combatants from artillery and aviation attacks. Underground tunnels and covered passages between buildings facilitate the discreet movement of reserves, attack groups or retreating forces. A *fougasse*—an improvised mortar created by hollowing out an area in the ground or rock and filling it with explosives and projectiles—is used to protect approaches to strongpoints.[5] Hidden web cameras monitor dangerous enemy avenues of approach. Command posts and supply and maintenance points are typically located in basements for added protection from air attack. Sandbags and bags of dirt are used to reinforce the second and third floors for further protection from aerial attack.[6]

To reduce the chance of air attack, armoured vehicles, artillery, and supply dumps are often located near civilian housing areas and community buildings such as hospitals, schools and churches. Analysis of recent combat actions shows that the enemy is usually not conducting a passive defence. In each building on the line of contact, there are typically teams of four or five combatants (three rifle operators, a grenadier and a sniper) who conduct observation, adjust artillery and engage in harassing fire to exhaust their enemy and pin them down in an already-mined building. Sniper teams and artillery observers operate from the higher floors. Each part of the defence has a reserve element of 20 to 30 combatants, with pickup trucks ready to reinforce forward positions within 3 to 5 minutes. Ammunition supply points and a personnel rotation schedule help retain the defensive positions over extended periods of time.[7]

As a Russian advance begins, the Ukrainian IAF reinforces its fighting positions with up to 20 combatants in each building. If the IAF is unable to maintain its fighting positions and a breakthrough is imminent, it will conduct an organized withdrawal and deliberately demolish the abandoned building as the Russian forces capture it. The IAF will "leapfrog" to the next building to slow down the tempo of the advance. It will also conduct limited counterattacks, utilizing personnel, weapons and heavy fire to reinforce its strength in selected directions in order to inflict casualties, enhance the combat capability of defending detachments or groups, and evacuate the wounded.

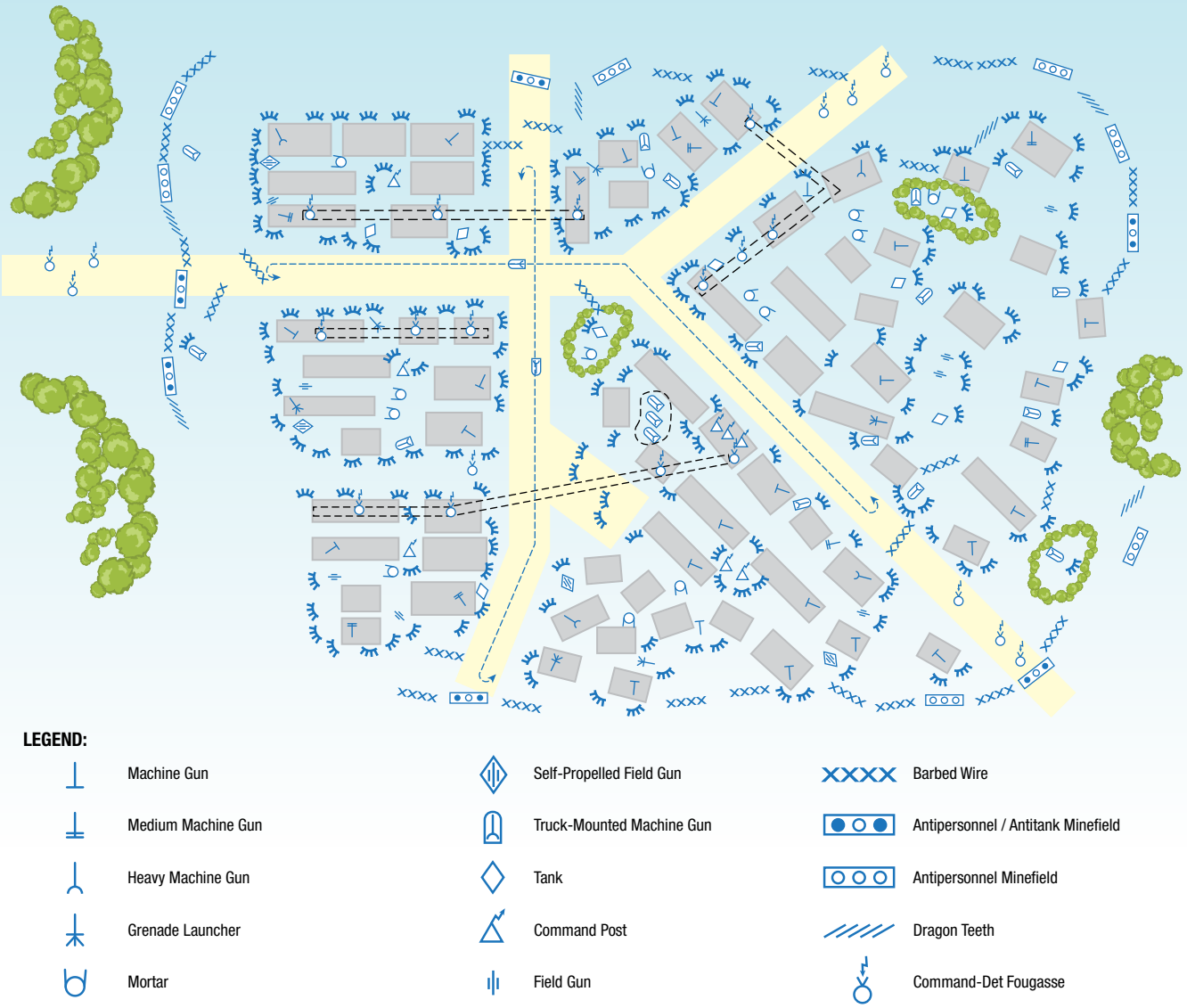


Figure 1: Illegal Armed Formation Defence of a City[8]

During a positional defence, the IAF tries to consolidate its defences within 100 metres of the attacking Russian forces to minimize casualties from massive aviation strikes and artillery fire. Combatants navigate between buildings through wall breaches, a network of paths and underground passages, and between floors utilizing homemade ladders and planks. To reduce the impact of aimed fire along narrow streets and closely spaced buildings, they stretch screening material across those areas and use homemade smoke grenades. Prepared passageways enable the IAF to move secretly and safely through the city buildings.[9]

Figure 1 illustrates a built-up area defending against a Russian attack in an Eastern European city, characterized by large commercial and high-rise apartment buildings. External and internal *fougasses* block entry on the main roads, while antipersonnel and antitank minefields, together with barbed-wire obstacles, surround the city.

Pickup trucks with antitank weapons are stationed on the outskirts. Slanted post and hedgehog obstacles block major roads leading into the city, and defensive positions form a ring around it. Self-propelled and towed artillery pieces are positioned to cover the main approaches with direct fire. Tanks are deployed to protect key access points or remain with reserve forces in wooded park areas. Mortars, which dominate city fighting and cause the majority of casualties, are located in apartment courtyards. The major roads divide the city into sectors, each with its own command post, and tunnels connect buildings and sectors. Pickup trucks also patrol the main streets.

In the course of combat, IAFs fire mortars and rockets at the Russian-controlled areas where both Russian forces and civilians are present. They use military mortars, multiple-launch rocket systems and locally produced weapons of varying calibres. In the city fight, Ukrainians may also use

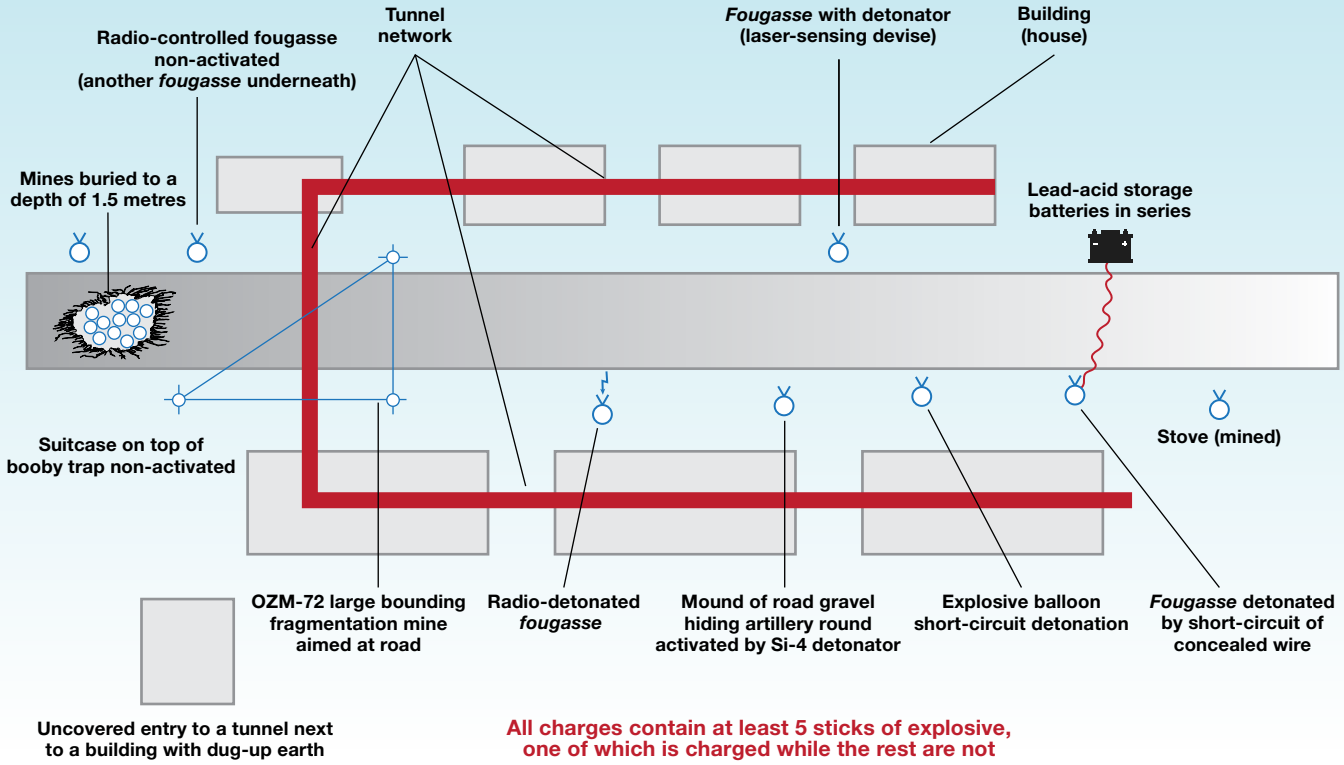


Figure 2: Illegal armed formations mining of urban streets (variant)[15]

homemade weapons and explosive charges made from industrial 10-litre gas balloons filled with ammonia, nitric acid, powdered aluminum and a firing device, resulting in a blast radius of up to two kilometres.[10] Notably, the IAF has mobile firing platforms that include mortars, other artillery, tanks, and armed pickups. Mortars are fired and adjusted from temporary, concealed positions using pre-planned firing data. Typically, the IAF fires no more than three mortar rounds from any one location. After firing, the mortar is rendered "out of action," moved to a new location some distance away, and camouflaged. Alternatively, a pickup may transport the mortar to a different firing sector.

When the illegal armed formation employs tanks in a mobile firing mode, the tanks are positioned in a prepared spot but carry only one main gun round and minimal fuel. The IAF believes this strategy enhances the tank's survivability in the event of an antitank guided missile strike, as there is no ammunition and little fuel available to detonate. A motorcycle courier delivers replacement rounds and a small amount of fuel as needed. Considering the lack of heavy equipment in an illegal armed formation, combatants are particularly focused on withdrawing and preserving this equipment in good condition for future use.[11]

Examining the Illegal armed formations

IAF tactics differ significantly. An IAF detachment may include representatives from different governments and armed bands, as well as a substantial number of volunteers, many of whom possess extensive military experience, including service in Afghanistan over 30 years ago. This diverse background allows their leaders to adapt creatively to changing circumstances. In certain cases, particularly when funded by external sources supporting the Ukrainian Special Forces, smaller IAF groups are incorporated into larger units, which may resemble military structures ranging from squads to brigades. Each IAF detachment may consist of combat groups with up to 500 personnel, along with a reserve group of the same size.[12]

When determining the composition and size of Ukrainian IAFs, it is essential to consider their unique circumstances. They often have "reserves" in the form of sympathizers from the local population residing in the same housing blocks. While these sympathizers may seem outwardly harmless to the average Russian observer, many possess concealed weapons. The actual reserve consists of former active IAF members who were denied volunteer status, denied participation in IAFs, disarmed, and subsequently legalized. Periodically, these two groups are integrated into active detachments of combatants to participate in major operations, conduct reconnaissance and confuse observers. IAF tactics are based on the following principles:

- close contact with the population;
- actions primarily carried out by small detachments and groups;

- widespread mobility of detachments;
- knowledge of and skilled use of terrain in laying out ambushes and tactically advantageous sites;
- active use of limited-visibility conditions, especially night;
- thorough selection of targets of attack, working out a simple and realistic plan of action;
- deep reconnaissance, preceded by detachment actions;
- secret and surprise actions utilizing military cunning;
- sudden opening of short-range fire, then withdrawal to a safe place;
- during the withdrawal, using small ambushes and single combatants that traverse narrow and difficult-to-negotiate terrain, firing from a moderate distance and covering the withdrawal of the detachment while conducting their actions;
- close cooperation by personnel while conducting actions;
- establishing good order on exhausted forces;
- providing psychological support during actions; and
- organizing security and reconnaissance.[13]

The IAF employs a strategy that combines terrorist diversionary tactics with traditional military combat. Their small detachments operate across a wide territory, creating an effect of being "everywhere." They make extensive use of nighttime, which serves as an effective cover for their operations, allowing for secrecy and surprise. This approach induces confusion and panic among enemy forces, disrupts the control of subunits, and can lead to successful engagements against superior forces. At night, combatants often regroup to launch surprise attacks by retreating along pre-planned routes and setting ambushes for pursuing forces. They strategically select ambush locations near the outposts and garrisons of different units. Nighttime is also advantageous for provocations and truces (parley, conduct of negotiations). The combatant leadership is responsible for such—as a rule, with a third party, generally the organs of law and order.[14]

IAF tactics are primarily offensive and incorporate elements of partisan warfare. IAFs rarely defend except in their base regions, at points critical to their functions, in individual inhabited areas, and at points necessary for encirclement or threatening actions. The main activities of their detachments include ambushes along routes of communication and raids on small garrisons, as well as frequent sniper attacks. The IAF also conducts large-scale terrorist acts to take hostages. A notable feature of modern partisan warfare is the extensive use of a wide variety of contemporary means for mine warfare.

The chief IAF combat commanders incorporate the following in their planning:

- When regular forces advance across a wide front, IAF detachments break contact and withdraw in small groups to set up ambushes and conduct answering attacks.
- Detachments do not participate in open frontal engagements; instead they retreat to occupy new, more advantageous positions.
- Detachments do not remain close to enemy forces for long. They quickly slip away unnoticed to find better hiding spots or advantageous positions.
- Massive strikes are conducted only with significant strength.
- Small subunits are employed to strike squads, acquire weapons and return strikes.
- Mortars, recoilless rifles and similar weapons are used to target important objectives and fortified positions held by regular forces. Small groups may consolidate to form a larger force capable of inflicting significant casualties through concentrated fire.[16]

IAFs' raid and attack objectives include guard posts, traffic regulator posts, route termination posts, commanders' offices, airfields and supply dumps, with the aims of seizing, destroying or disabling those targets. Successful raids always require thorough reconnaissance and effective disinformation, often facilitated by the local population. Commanders must study the approach to the objective, establish systems for security, signals and obstacles, and assess the capabilities, the timing, and the approach routes for their forces. Surprise is always a key factor in these operations. A typical raid involves up to 30 personnel divided into specific groups: pre-reconnaissance, security suppression, covering and main force (storm group).

The pre-reconnaissance group advances toward the target to establish observation and identify changes in the security system, as well as the best approaches to the target and potential withdrawal routes. In the event of a surprise encounter with a stronger enemy, this group withdraws to the side, away from the main body, to set up a coordinated

fire sac with the main forces. It is important to note that the pre-reconnaissance group consists of members from the local population.[17] Furthermore, the security suppression group establishes its position close to the target, blocks paths of possible manoeuvre by the alert force or reserve and establishes approaches for reserve units designated to assist the guard force. After the raid, the security suppression group joins the main body of the detachment.[18] The main body (assault group) moves behind the security suppression group and quickly attacks to capture or destroy the target. If it is unable to hold the objective or the objective has moved, the group quickly withdraws from the area in small groups and disperses.[19] Occasionally, a special deflection group is also formed to support the operation.[20]

The IAF employs another tactic to exhaust the enemy that complements their raids: systematic fire targeting military details or units. Small groups of combatants (5–10 personnel) typically carry out this tactic at night. Multiple groups will move toward the objective, with one group drawing enemy fire while the others target the exposed enemy firing positions. Alternatively, they may adapt to the situation by conducting rapid, close-up drive-by shootings from their vehicles.[21]

Snipers and Ambushes

Snipers present a special danger to forces combating IAFs. They fight with specialized sniper weapons, but in addition they often use automatic military rifles and sporting rifles. Individual snipers plan their movement carefully and select an advantageous, difficult-to-detect position such as an attic, the upper floor of a home, a factory smokestack, a bridge or a crane. The concealed position must hide the sniper, the weapon and the ammunition, thus allowing the sniper to skilfully create the conditions to shoot the maximum number of personnel per mission. After wounding a soldier (as a rule, fatally), the sniper next wounds fellow soldiers or medics who come to the first soldier's aid. Then the sniper kills all the wounded, and the first wounded soldier, if not having been initially killed with the first shot, is often the last killed.[22]

An IAF successfully uses sniper groups, which include two-personnel sniper teams (observer and shooter) covered by assault rifles and grenade launcher cover (two or three personnel). After taking a commanding position in a tall building or a lower floor near the Russian soldiers, the group begins firing—often without precise aim—at a target area. The sniper leverages the chaos and noise of battle to attract, identify and eliminate key targets.[23]

The most effective and common method of combat utilized by an IAF is setting ambushes. A thorough, careful determination precedes the selection of an ambush site, the most effective being bridges, gorges, covered turns in the road, ridges and sloping heights, forested mountains, passes, and canyons. The site must support the concealed disposition of the force, a simultaneous strike, and effective fields of fire for destruction and a quick withdrawal. An IAF has special-purpose ambushes for containment, destruction or capture. The choice of ambush depends on the combination of combat situation, the overall and local correlation of forces and means, terrain and other factors. For instance, when conducting a destruction ambush, the IAF's main tasks are to determine the smallest force that can successfully carry out a destruction ambush, quickly move the force, and assume combat formations. Furthermore, during a containment ambush, the IAF deploys forces of up to a company size for several hours. Depending on the ambush mission, from 10 to 20 personnel and up to 100 may participate. For larger ambushes, typically, two firing lines are used.[24]

The composition of an ambush is determined by the size of the detachment, the target and the target strength. It can consist of a fire/strike group, a deflection group, a group to impede manoeuvre and a withdrawal support group. Additionally, there may be an observation group, a communications group and an information group, as well as a heavy equipment transport group. The fire/strike group is primarily responsible for destroying personnel and equipment. Positioned near the zones of planned employment, it includes a shooter, a subgroup for capturing prisoners, and sappers.[25]

The deflection group assembles close to the zone of action with the mission to draw fire on itself from the security subunits (or even the main body). It moves onto the ambush site first, and, if ordered by the commander, may dig in mines or *fougasses*. In addition, the deflection group forms a single firing line in conjunction with the fire/strike group, thus supporting the group's efforts. The line opens fire on the distant advancing enemy. Drawing fire, it moves to a new position to conduct flanking fire on the advancing enemy.[26]

The group to impede manoeuvre and the withdrawal support group position themselves along the expected avenues of approach to carry out their missions. They provide covering fire but seldom emplace mines or other obstacles. If needed, the reserve can reinforce either the fire/strike group or the withdrawal support group, supporting the main force during disengagement and withdrawal. The observation group and covering group are situated on its flanks and rear.

The observation group, communications group and an information/reconnaissance group do not engage in combat. Their responsibilities include reconnaissance, determining the time it takes to move the force from its starting point, the composition, and the direction of the movement. Combatants within its ranks actively converse with unencrypted radio stations to support the force

columns, sharing information on operational movements within the detachment. Both armed and unarmed personnel broadcast information at the tail of the column and then overtake it on passing vehicles. The heavy equipment transport group parks at turnoffs on the road, ready to evacuate detachments, captured equipment and prisoners.[27]

As a rule, an ambush allows the forward security and reconnaissance elements to pass through. A detonated *fougasse* knocks out the lead vehicles in the main column, after which fire focuses on command and staff vehicles as well as the centre of the column. The primary targets are tanks, BMPs, BTRs (Soviet/Russian military armoured personnel carriers) and other combat vehicles that are capable of returning fire. The experience of contemporary conflicts has showcased, especially to the Russians, that IAFs are well organized, employ detachment tactics effectively, have a solid command and control system, and conduct combat using contemporary manoeuvre of reserves, enabling it to gain mastery over [Russian] government forces.[28]

IAFs RARELY DEFEND EXCEPT IN THEIR BASE REGIONS AT POINTS CRITICAL TO THEIR FUNCTIONS IN INDIVIDUAL INHABITED AREAS AND AT POINTS NECESSARY FOR ENCIRCLEMENT OR THREATENING ACTIONS.

IAFs have particular well-designed tactics that include

- positioning manoeuvre forces along the target road in well-prepared and concealed positions (sometimes underground) that are connected with their approach route;
- establishing fragmented defences in populated areas;
- using armoured vehicles (tanks and BMPs) in urban strong points and on key roads;
- in two-phase advances, using mobile firepower mounted on highly mobile light vehicles;
- defending populated areas in mountainous and hilly areas with minimal forces in the urban site while positioning the bulk of the force in the heights;
- offering IAF assault detachments with temporary strong points and cover using bulldozers to create barriers of mounded dirt and debris (up to five metres high);
- withdrawing rapidly from forward positions after inflicting a rapid strike on a single objective;
- inducing anxiety with mortar and rocket fire, sniper attacks and sudden night attacks on the positions of legitimate armed forces;
- equipping assault units with radios with less than five watts of power (taking into consideration the maximum and minimum distances between net subscribers) to prevent radio reconnaissance and jamming; and
- use of code books, retransmission stations and satellite communications.[29]

CONCLUSION

Although Russian military training (in the classroom and in the field) emphasizes large-scale combat, the majority of the Russians' actual combat experience over the past 40 years has been at a lower tactical level of war, primarily against guerrillas supported by professionals. The article by Kondratiev and Tanenya appears to consolidate and incorporate those identified lessons into a detailed model and checklist of not only city fighting but also combat against territorial and irregular forces in general. This article appears to synthesize those identified lessons into a detailed model and checklist for urban combat, as well as for engaging territorial and irregular forces more broadly. The characteristics of the fighting, its lethality, and the challenges posed by irregular forces discussed in the Russian *Army Digest* article align with the Russian forces' own experiences and perceptions of their current Ukrainian opponents, particularly the volunteer units like the Territorial Defence Forces and the Special Tasks Patrol Police. Overall, Kondratiev and Tanenya's work would resonate strongly with Russian officers; given its timing, it conveys a sense of urgency and serves as a substitute for the more deliberated, officially sanctioned and published updates to fighting techniques and tactics. In a nutshell, the ongoing war serves as a case study for military adaptation and the evolution of tactics across various militaries, including Russia's, in response to the unique challenges presented by urban warfare.

ABOUT THE AUTHORS

Dr. Lester W. Grau is a senior analyst for the Foreign Military Studies Office at Fort Leavenworth, Kansas. He has served the U.S. Army for 57 years, retiring as an infantry lieutenant colonel and continuing service through research and teaching in Army education. His on-the-ground service included military assignments in Europe, South Vietnam, Korea and the Soviet Union, as well as civilian research in Afghanistan, Iraq and Russia. His primary research language is Russian. He is the author of 18 books and more than 250 articles on tactical, operational and geopolitical subjects.

Dr. Charles K. Bartles is an analyst and Russian linguist at the Foreign Military Studies Office at Fort Leavenworth, Kansas. His specific research areas include Russian and Central Asian military force structure, modernization, tactics, officer and enlisted professional development, and security assistance programs. Chuck is also a space operations officer (FA40) and lieutenant colonel in the US Army Reserve that commands Detachment 6, 2100 Military Intelligence Group, in Lincoln, Nebraska. He has deployed to Afghanistan and Iraq and has served as a security assistance officer at embassies in Kyrgyzstan, Uzbekistan and Kazakhstan.

ENDNOTES

1. Editors' Note: This article presents a translation of a piece originally published by Russian military sources (*Army Digest*). The editors' decision to include this content has been made with careful consideration and a commitment to academic rigour. The intent is not to promote or endorse the narratives presented by those sources, but rather to provide insight into their experiences in the ongoing conflict with Ukraine. By examining this perspective, we aim to enhance understanding of the multifaceted nature of the war, including insights into Ukrainian strategies, Russian experience in the contemporary war, and the information operations employed by both sides. We encourage readers to engage critically with the material, recognizing the complexities involved in the ongoing discourse surrounding this conflict.

2. A. Kondrashov and D. Tanenya, "Бой в Городе" [Combat in a City], *Армейский Сборник* [*Army Digest*], May 2022, 34.

3. Ibid.

4. Manoeuvre defence [манёвренная оборона] is a tactical and operational form of defence whose goal is to inflict enemy casualties, gain time and preserve friendly forces with the potential loss of territory. It is conducted, as a rule, when there are insufficient forces and means available to conduct a positional defence. The Russian manoeuvre defence differs substantially from the U.S. concept of the mobile defence, which is defined as "a type of defensive operation that concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force. It focuses on destroying the attacking force by permitting the enemy to advance into a position that exposes him to counterattack and envelopment. The commander holds most of his available combat power in a striking force for his decisive operation, a major counterattack. He commits the minimum possible combat power to his fixing force that conducts shaping operations to control the depth and breadth of the enemy's advance. The fixing force also retains the terrain required to conduct the striking force's decisive counterattack." Ministry of Defence of the Russian Federation, Манёвренная оборона, Военный энциклопедический словар в двух томак [Military Encyclopedic Dictionary in Two Volumes], Volume II, Moscow: Ripol Klassik, 2001; Department of the Army, "Chapter 10: the Mobile Defense," Field Manual 3-90, Tactics, Washington, DC: U.S. Government Publishing Office, July 2001.

5. Ibid. A *fougasse* is an improvised directed-projectile mine made by digging an aimed slanting hole and filling it with a centre-primed explosive and then rocks or a highly flammable substance. Oil drums, milk cans and barrels can also be used in lieu of slanted holes. These can be centre-primed and aimed much more easily and accurately than a hole. When fired, a *fougasse* shoots a fury of destruction into the expected path of the enemy.

6. Ibid.

7. Ibid., 34–35. Rotation of troops in urban combat is essential for resting the troops and preventing psychiatric problems. For a discussion of logistics in the urban fight, see Lester W. Grau and Timothy L. Thomas, "'Soft Log' and Concrete Canyons: Russian Urban Combat Logistics in Grozny," *Marine Corps Gazette*, October 1999, https://community.apan.org/cfs-file/__key/telligent-evolution-components-attachments/13-14863-00-00-00-24-37-66/1999_2D00_10_2D00_01-Soft-Log-and-Concrete-Canyons-_2800_Grau-and-Thomas_2900_.pdf?forcedownload=true.

8. Ibid.

9. Ibid., 35.

10. Ibid.

11. Ibid., 36. This peculiar use of tanks as one-shot snipers apparently applies only to forward tanks in the mobile firing mode. Tanks in the reserve or positioned for sustained combat carry as close to a full load of fuel and ammunition as the on-hand supplies allow. The one-shot sniper tanks do not normally remain in their firing position after firing, but move to another position where the motorcyclist delivers to them. For a discussion of Russian attacks on urban areas, see Lester W. Grau, "Attacking in a City: The Russian Motorized Rifle Battalion Approach," *Infantry*, January–March 2018, lead article, https://www.benning.army.mil/infantry/magazine/issues/2018/JAN-MAR/PDF/6)Grau-AttackingCity.pdf.

12. Ibid.

13. Ibid., 36–37.

14. Ibid. Much of this is similar to the partisan warfare conducted by the Soviets in World War II. For detailed Soviet partisan tactics, see *The Red Army Do-It-Yourself Nazi-Bashing Guerrilla Warfare Manual* (*The Partisan's Companion*), translation and commentary by Lester W. Grau and Michael Gress (Havertown: Casemate, 2010). Originally published as the 1943 Soviet edition, *Спутник Партизана*, which was used to train partisans to fight the Nazis.

15. Ibid., 38.

16. Ibid., 37–38.

17. Ibid.

18. Ibid.

19. Ibid.

20. Ibid., 38.

21. Ibid., 39.

22. Ibid.

23. Ibid.

24. Ibid.

25. Ibid., 39–40.

26. Ibid., 40.

27. Ibid.

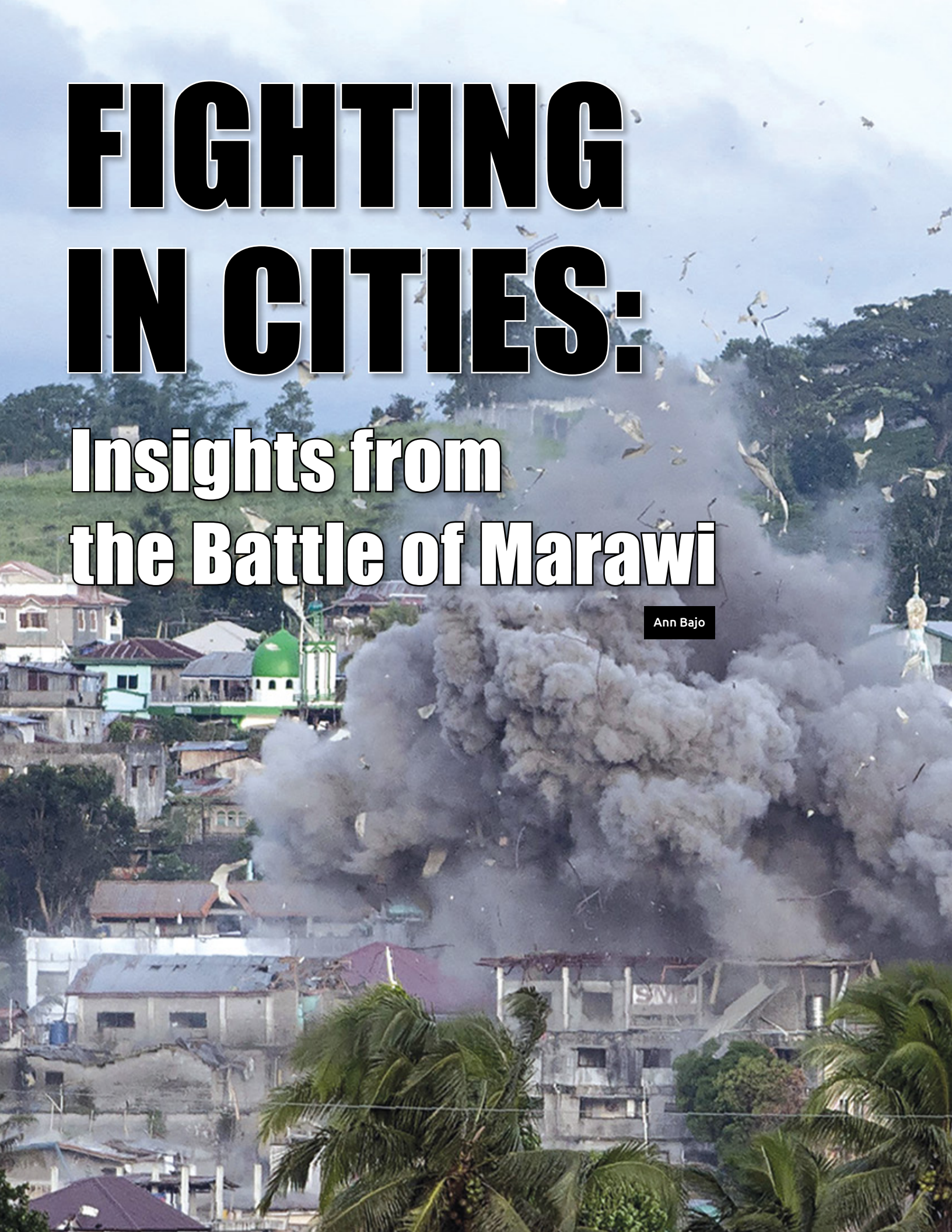
28. Ibid.

29. Ibid.

FIGHTING IN CITIES:

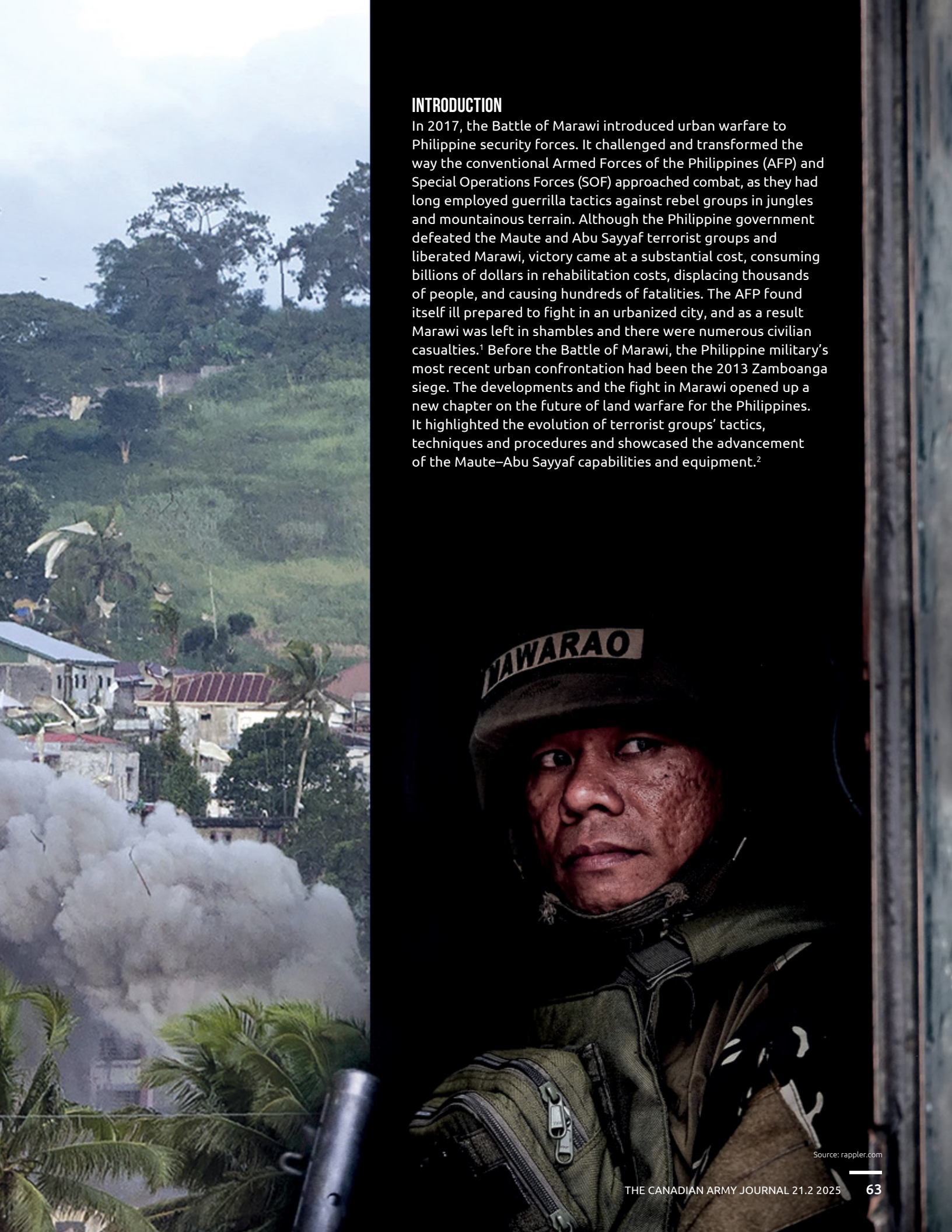
Insights from the Battle of Marawi

Ann Bajo



INTRODUCTION

In 2017, the Battle of Marawi introduced urban warfare to Philippine security forces. It challenged and transformed the way the conventional Armed Forces of the Philippines (AFP) and Special Operations Forces (SOF) approached combat, as they had long employed guerrilla tactics against rebel groups in jungles and mountainous terrain. Although the Philippine government defeated the Maute and Abu Sayyaf terrorist groups and liberated Marawi, victory came at a substantial cost, consuming billions of dollars in rehabilitation costs, displacing thousands of people, and causing hundreds of fatalities. The AFP found itself ill prepared to fight in an urbanized city, and as a result Marawi was left in shambles and there were numerous civilian casualties.[1] Before the Battle of Marawi, the Philippine military's most recent urban confrontation had been the 2013 Zamboanga siege. The developments and the fight in Marawi opened up a new chapter on the future of land warfare for the Philippines. It highlighted the evolution of terrorist groups' tactics, techniques and procedures and showcased the advancement of the Maute–Abu Sayyaf capabilities and equipment.[2]



Source: rappler.com

This article offers an overview of the Philippine military's experience in urban warfare, highlighting the evolution of the AFP's concept of operations (CONOPS) during the battle and identifying pertinent lessons. The first section describes the Philippines' contemporary experiences in urban warfare, with a focus on the Zamboanga Crisis and a brief overview of the battle. The second section recounts the main operational phases. The third section assesses the AFP's capabilities in urban warfare, examining the following components: ground forces, combat engineers and uncrewed aircraft systems (UAS).

The information put forth in the article is mostly sourced from internally published reports, interviews, and the research notes taken by the author during the deployment to Marawi to document the war for the Joint Special Operations Group (JSOG). It is important to acknowledge that the author had the privilege of being the sole civilian permitted to reside in the main battle area (MBA) for an extended period and that she subsequently authored the JSOG's special operations doctrine. As demonstrated in the article, the Philippines' experience of military operations in urban terrain revealed the AFP's limitations in urban warfare and stressed the need for capability development.

THE PHILIPPINES' EXPERIENCE IN URBAN WARFARE

The Zamboanga Crisis of 2013

The Battle of Marawi was not the first urban battle that the AFP had encountered. On 9 September 2013, the Moro National Liberation Front (MNLF) attacked Zamboanga City. The Philippine government was involved in a long-standing conflict with Moro rebels, rooted in Moro resistance that dated back to the colonial period. The Moro resistance has a long history, beginning during Spanish colonization as the Moros defended their lands and culture. The struggle continued under American rule and against the Manila government, especially due to migration policies favouring Christian settlers. In the late 20th century, the rebel groups gradually transformed into armed factions, each advocating for the rights and autonomy of the Bangsamoro people (Muslim-majority communities in Mindanao). The earliest contemporary armed group was the MNLF, led by Nur Misuari. The Philippine government signed a peace agreement with the MNLF which led to the creation of an autonomous region in the Southern Philippines. Later on, however, another group emerged: the Moro Islamic Liberation Front (MILF), led by Hashim Salamat. That group broke away from the MNLF due to dissatisfaction with Misuari's leadership. The MILF gained strength and numbers, ultimately becoming the most powerful Moro rebel group. The MNLF was deeply dissatisfied with the peace process undertaken by the government with the MILF, which had eventually opted for more diplomatic and peaceful methods to seek official recognition for the Muslim population in a more political context.

The MNLF's dissatisfaction stemmed from the neglect of previous agreements with the MNLF, which were overlooked during negotiations between the Philippine government and the MILF.[3] In response, the MNLF tried to raise the flag of the self-proclaimed "Bangsamoro Republik" at Zamboanga City Hall.[4] The clash lasted nearly three weeks and resulted in the displacement of more than 100,000 people, an estimated 240 civilian casualties, and the closure of Zamboanga City Airport, thus hampering economic activity in the city.[5] The Battle of Zamboanga was an urban operation under precision conditions imposing severe restrictions on the use of firepower because the enemy forces were thoroughly mixed with non-combatants in the city.[6] Even the hostages were contained and managed in Zamboanga, which added another layer of complexity. It is worth noting that the SOF personnel who operated in the battles of Zamboanga and Marawi described the former as less strenuous because the structures in the city were mostly shanty houses made of light materials.[7]

SOFs are typically the go-to units of the AFP, and JSOG is made up of the counter-terrorism and readily deployable SOF units of the AFP. Before the attack in Zamboanga, the AFP's intelligence community had gathered information about the MNLF's plans and warnings of an impending assault on Zamboanga City, but that information was not processed effectively.[8] Despite that, the military focused on organizing a well-equipped elite combat unit. In particular, following the MNLF attack, JSOG deployed the Light Reaction Battalion (LRB) under its operational control (OPCON). The LRB was specifically created to carry out surgical operations and precision strikes designed for close quarters battle (CQB) in places such as buildings, buses and trains. Moreover, it was tasked to conduct highly sensitive operations including neutralization of high-value targets / high pay-off targets (HVT/HPT), hostage rescues and counter-terrorism.

Traditionally, the AFP has tended to activate new units every time a major conflict arises instead of developing the readiness level of existing units, even though the latter would make more sense financially. For instance, instead of improving its intelligence system in response to the Zamboanga Crisis and Marawi, it activated the Light Reaction Regiment (LRR), which led to the creation of the AFP Special Operations Command. That noted, given the success of the LRB in Zamboanga, the Philippine Army (PA) expanded the LRB to the LRR in 2014. At the time, the PA was unaware that the LRR would become one of the key combat units during the Marawi operations. Even the AFP SOF took on new challenges in urban warfare as they prepared to combat local terrorist groups in the Marawi battle.

The Marawi Battle (23 May–23 October 2017)

The Marawi battle was a five-month-long armed conflict between Philippine security forces and local terrorist groups inspired by Islamic State in Iraq and Syria (ISIS), namely the Maute Group and the Abu Sayyaf Group (ASG). Officially known as the Islamic City of Marawi, it is a predominantly Muslim city inhabited by the Maranao ethnic group. The persistence of violence and terrorism in Marawi are influenced by diverse factors, including historical grievances of the Muslim community, economic disparities, ethnic and religious tensions, political instability and inadequate governance, *redo* (clanfeuds), ineffective counterterrorism measures, and challenges related to social cohesion.[9] The widespread gun culture among Maranao's, together with their tendency to possess weapons, further supported militant groups.[10] Consequently, the violent resistance to government authority in Marawi created conditions conducive to harbouring and recruiting terrorists.[11]

Leading up to the battle, the AFP recovered video evidence revealing the Maute-ASG's planning for a major attack in Marawi City and other locations throughout Mindanao, a major island in the Philippines long tormented by the presence of Islamic separatists, local warlords, clan militias and communist rebels.[12] The video footage showed Abdullah Maute, one of the founders of the Maute Group, presiding over a meeting with his cohorts, including Isilon Hapilon, the leader of ASG, in which they were planning their clandestine operations in Marawi.[13] Their primary objective was to raise an ISIS flag at the Lanao del Sur Provincial Capital and declare a *wilayat* (a provincial ISIS territory) in Lanao del Sur. The Maute-Abu Sayyaf Group initially planned to attack Marawi three days after the pre-empted attack on 23 May, in order to coincide with the beginning of Ramadan.[14] They pre-positioned themselves within the city and reconstructed the battleground in a manner that was more favourable to them.[15]

The clash began when a mission to capture Isilon Hapilon turned into a deadly firefight.[16] The Maute Group and ASG militants attacked Marawi City, including the military camp, the police station and the city jail, freeing 68 inmates. They occupied several buildings in the city, including the Marawi City Hall, Mindanao State University and the *Amai Papa* Medical Center, and took several civilians hostage at Dansoman College. All of that occurred during the first day of fighting in Marawi City. It turned out that the militants had been planning the attack for several weeks and were better prepared because the battleground was their hometown.

The Battle of Marawi: Crucial Lessons

The battle was high-intensity urban combat with the militants occupying well-thought-out positions to conduct their engagements and ambushes.[17] The choice of Marawi as a battleground was natural for the Maute brothers, Omar Maute and Abdullah Maute. Marawi served as the Maute's' stronghold, and its status as the sole Islamic city in the Philippines rendered it favourable for the religion-inspired militant group.[18] The location also offered easy access to supplies, back-door passage of reinforcements and escape routes.[19] Buildings and structures around the city were fortified and built to stand against clan attacks in view of rampant clan feuds (*redo*) in the area. As a result, in preparation for their 26 May attack, the Maute-ASG fighters were already embedded and well pre-positioned around Marawi City. At that point, the attacking force had the advantage and momentum, which proved disadvantageous for the defending government forces.

The battle started when a Philippines security force special operation prematurely triggered the planned Maute-ASG uprising. AFP and police operations were initially reactive and surprised as they encountered a totally unexpected type and size of threat, including a major attack on the army camp and well-prepared ambushes. The AFP were concurrently trying to mount rescue operations for their trapped comrades, isolate the city and, after several days, manage a massive outflow of refugees. As the battle progressed, government forces learned and adapted, and their CONOPS and task organization were constantly evolving. The Marawi campaign can be divided into three main phases of operations:

- **Phase 1 – Initial Phase:** Implementation of Target Packet Bingo. This involved a special operations mission to capture ASG leader Isilon Hapilon in a hideout, triggering the militant group's planned attack.

- **Phase 2 – Sector Clearing:** Operational Plan (OPLAN) Liberation. This plan involved the implementation of a sector-based plan to clear the city and included the development of the CONOPS in the area of operations (AO) and standing up Joint Task Force Marawi (JTF Marawi), functioning as a mission command post assigning mission-essential tasks to main effort units.

- **Phase 3 – The Final Push:** The MBA and Neutralization of HVTs. This was the final push to clear the MBA and force the enemies toward a constriction area in order to isolate the HVTs. It also included the organization of Joint Special Operations Task Force Trident (JSOTF Trident).

The overarching mission of the AFP was to eradicate terrorist elements in Marawi City.[20] It was challenging for the AFP to execute such a campaign, given its lack of experience and capabilities in urban warfare. Consequently, the battle extended beyond the initially anticipated duration and resulted in severe damage to the city and many casualties among its population.

Source: Noel Celis, Getty Images

Phase 1 – Target Packet Bingo

OPLAN Bingo was a special operations mission aimed at executing a high-risk warrant of arrest for Isilon Hapilon at an identified hideout in Basak Malu lot, Marawi City, on 23 May 2017. The mission was designed based on a target packet identified by the Naval Intelligence and Security Group-Western Mindanao.[21] It was assigned to Joint Special Operations Unit 3 (JSOU3), made up of the 4th Light Reaction Company, elements from the 8th Naval Special Operations Unit and a Philippine Forward Air Controller team.

At the onset, as the government forces approached the safe house where the target was believed to be hiding, they were engaged by Hamilton's cohorts. Unfortunately, JSOU3 had miscalculated the extent of the enemy's foothold in the area. They were caught off guard and found themselves fixed in combat for nearly three days. During the initial encounter, two members of the government troops were killed immediately and one was seriously injured.[22] The government forces failed to arrest Hamilton, who managed to escape the raid. The failed execution of OPLAN Bingo to capture Hamilton forced the Maute Group to carry out its uprising prematurely. The battle at the safe house escalated into a larger military campaign in the heart of Marawi City as the Maute and ASG groups emerged from hiding and went on a rampage, attacking establishments in the centre of the city.

In hindsight, two critical factors contributed to the government mission's failure: inadequate intelligence and insufficient rehearsals. First, the intelligence report acquired by the operating units was inaccurate. Operational planning for the previous mission had relied on human intelligence, a photo of the house, and Google maps showing Hamilton's presumed location.[23] Operating units relied on initial estimates of 10 enemy fighters, but it became apparent that there were roughly 100 of them surrounding Hamilton, including in neighbouring houses.[24]

Second, the AFP had not made a range of contingency plans for the mission and had not conducted contingency rehearsals. The intelligence report indicated that Hamilton was constantly on the move and might unexpectedly move to another location.[25] Due to the urgency of the mission, JSOU3 conducted only a partial reconnaissance of the target area and had limited time for a rehearsal, thereby decreasing the mission success rate. The unit also failed to develop a contingency plan for possible scenarios or factor in the reaction of enemies during the operation.[26] The hurried planning for OPLAN Bingo can be largely attributed to competition within the intelligence community. Prior to OPLAN Bingo, the AFP, through Joint Task Force Gameplan, had launched a series of military operations to hunt down the ASG leader Hamilton and the Maute brothers, all of which failed.[27] The pressure to capture Hamilton and the Maute brothers stemmed from monetary rewards offered by the US government and the Philippines to those who successfully captured the HVTs. The US government offered a $5 million reward for Hamilton, while President Duterte offered around $350,000 for Hapilon and $100,000 each for the Maute brothers.[28] The focus of the intelligence community on targeting the HVTs was so intense that actionable intelligence, which could have potentially prevented the battle, was unfortunately lacking.

Given the intensity of the threat posed by the militant groups, Mindanao was placed under martial law in accordance with Proclamation No. 216 issued by President Duterte.[29] The operation in Marawi required additional troops as the situation continued to worsen. However, due to limited mobility assets, it took weeks to transport acquired units to Marawi, thus demonstrating the perils of underestimating the enemy's size and capability and the nature of the battle.

Phase 2 – Sector Clearing: OPLAN Liberation

During Phase 2, the reliability of intelligence was once again insufficient to effectively support and sustain all phases of the Marawi battle.[30] In the early stages of Phase 2, all the units that responded and were deployed to Marawi described their experience of entering the battle as "being blindfolded." Units were not given accurate estimates of enemy forces, and the operating environment was not well understood. Intelligence briefings were generic and lacked the required tactical information, such as the enemy's strength, location and terrain.The periodic underestimation of enemy strength and the uncertainty regarding enemy locations compromised the effectiveness of operating units.[31] When some units were hurriedly deployed to augment forces in Marawi, they were logistically unprepared, lacking sufficient personnel and supplies to sustain their operations. The grim situation was aggravated by a "silo culture," which meant that not all operational units were included in intelligence briefings.[32] Additionally, some

operational units had to function with limited equipment/facilities and poor or inadequate intelligence analysis, which should have contributed real-time information to the common operational picture throughout the battle.[33]

Security forces were initially prevented from entering Marawi. The enemy controlled the Mapandi, Bangolo and Masiu bridges, which were the main entry points to the city, and set up roadblocks and checkpoints.[34] In one of the initial encounters, an attempt to attack the enemy frontally across a bridge led to 53 casualties among the Marines.[35] In addition, the enemies ambushed an armoured personnel carrier that was supposed to evacuate the casualties but remained trapped in the firefight for five days.[36] It took the government forces two months to reclaim the Mapandi Bridge, which opened favourable manoeuvre space for subsequent assaults. Likewise, envelopment as a form of manoeuvre allowed the government forces to achieve a position of advantage. Other units that approached Marawi from the north and northeast found it challenging to enter via the bridge, as the enemy had fortified its position there. In contrast, when approaching from the east, the AFP encountered less resistance. These areas served as an avenue of approach for joint forces in constricting the enemy presence in Marawi.

After moving the forces into position, the AFP implemented OPLAN Liberation, which led to the creation of JTF Marawi, conceptualized as a unit to carry out the following objectives: conduct sustained military operations and insulate areas from extremism; establish civil security and control; and support early recovery and rehabilitation of Marawi.[37] The general strategy of JTF Marawi was to divide the city into sectors, number the buildings as a control measure, conduct deliberate room-to-room clearing operations and secure the area. Joint Task Groups (JTG) were created to allow military decision making at an operational level.

Initially, JTF Marawi was composed of seven JTGs that complemented each other's functions, including conducting focused military operations (FMO), rescuing hostages and trapped civilians in the conflict zone, facilitating the movement of internally displaced people and securing critical infrastructure.[38] In a three-month clearing operation, FMOs reduced the number of affected *barangays* (the smallest administrative unit in the Philippines) from 96 to 9. Enemy-controlled structures were significantly reduced from 2,500 to 1,000, and the enemy's strength was reduced to 175. Yet JTF Marawi expanded further to 12 JTGs composed of 8,753 security force personnel from the AFP Major Services and Philippine National Police (PNP).[39] As the Marawi operations scaled up and the force structure expanded, two prominent operational challenges became apparent: joint operations and command and control (C2).

Source: Wikipedia

The following bridges over the Agus River in Marawi were tagged as strategic targets by government forces (in parentheses are the dates the government secured control over them). From top to bottom: Mapandi Bridge (July 20) Bayabao (Banggolo) Bridge (September 1) Raya Madaya (Masiu) Bridge (September 24). Islamic State of Iraq and the Levant-linked militants were concentrated on the west side of the river.

Joint Operations: One of the prominent reasons why joint operations faced challenges was that combat service, particularly in communication, and combat service support, which includes sustenance and logistics, were primarily service-centric in nature. Sustainment support provided by the Army was mainly allocated to Army units and personnel, and the same was true for other major services. This service-centric mindset, i.e. "what belongs to a service remains with a service," caused problems and was counter to the concept of "joint culture." Marawi developed the knowledge and leadership of Filipino commanders in joint, combined arms and urban operations. The battle, arguably the first of its kind in the Philippines, tested the commanders' abilities to make combat decisions when deploying land, naval and air assets simultaneously in urban terrain.

Army and Marine commanders were seasoned and experienced fighters and leaders, and they were particularly skilled in the spontaneous tactics of guerrilla and jungle warfare. Based on this existing skill set, the AFP commanders continued to act spontaneously when it came to joint operations and urban warfare. The spontaneity became a setback because, accordingly, some units were not deployed doctrinally for urban operations.[40] Joint training and exercises will address deficiencies of combat experience in urban settings. The lack of joint culture between the Army and the Navy was evident in terms of which doctrinal approach, whether land power or naval power, should be adopted by the mission command. Periodic exercises such as *Balikatan* and *Dangit Pa* have remained valuable training platforms, but they are insufficient to inculcate joint culture. The AFP has also developed doctrines, such as joint operating concepts, but these have yet to be ingrained and tested in battlespace.

Command and Control: The Battle of Marawi illustrated that C2 is compromised in the face of differing operating concepts among major services that are task-organized into a joint force.[41] For example, JTG Lawa (headed by an Army commander) was activated to assume control of maritime units from the Special Forces Regiment (Airborne) with riverine assets, the Philippine Coast Guard, and PNP Maritime and Special Action Force Seaborne to secure Lake Lanao. However, the Philippine Navy's Naval Task Unit (NTU) remained in control of JTG Tiger (a Marine commander). NTU was directly supporting JTG Tiger and conducting maritime operations in Lake Lanao in coordination with JTG Lawa. However, JTG Tiger, comprising Marine Battalion Landing Teams (MBLT) and the Marine Special Operations Group, insisted on the Fleet-Marine concept.[42] Thus, NTU failed to act on direct orders from JTG Lawa without proper clearance from JTG Tiger. It was a predicament which posed a significant challenge during that period, resulting in both a delay in operations and missed targets of opportunity. For example, JTG Lawa was created to ensure the efficient and unimpeded deployment of surface assets, preventing combatants from utilizing the lake as an escape or reinforcement route. However, as the militant group was forced to move toward the constricted area, some combatants escaped via the lake, which JTG Lawa was unable to prevent.

Yet another challenge in terms of jointness and C2 issues was the Mapandi Bridge incident, which resulted in huge casualties for the Marines. JTF Marawi found it difficult to achieve both operational tempo and simultaneous actions.[43] The incident was more of a C3 (command, control and communication) failure, as it went beyond the issues of C2 and created communication-related challenges as well. JTF Marawi had allocated each task group a sector in which they were to conduct simultaneous clearing operations to penetrate into the city. This plan involved arranging a Scout Ranger Battalion (SRB) under JTG Musang in the centre, a Joint Special Operations Unit (JSOU) under JTG Vector on the left, and an MBLT under JTG Tiger on the right. The latter was designated to cross the Mapandi Bridge, keeping level with the JSOU. However, the MBLT was able to advance forward of the SRB and the JSOU (who claim that they asked the MBLT to halt) and was left vulnerable as it crossed the Mapandi Bridge. Beyond the bridge, the enemy sprang an ambush, and a wave of them swarmed the MBLT's location, inflicting heavy casualties and rendering the element ineffective. The enemy force was able to exploit the MBLT's position because of a lack of coordination.[44] Another incident was the fratricidal fires of the Philippine Air Force (PAF) planes onto the 44th and 15th Infantry Battalions, while providing close air support to the infantry units. According to the report, JTF Marawi failed to update ground units and PAF pilots on the disposition of troops in the MBA.[45]

At the beginning, JTF Marawi had a weak C2 command post that deployed its task groups independently, leaving the decisions regarding movement and manoeuvre to tactical commanders in their respective AOs. Although some ground commanders appreciated the flexibility and independence, this produced isolated tactics without considering the operational and strategic issues across the battlefield.[46] JTF Marawi, as a mission command post, should have provided a common operational picture throughout its commanded units. The Mapandi Bridge incident and fratricidal fires yielded important lessons, emphasizing the need for unity of command and synchronization of efforts among the JTGs. Armed with that knowledge and to ensure synchronization of efforts in the MBA, JSOTF Trident was created as an intermediate SOF level of command to allow prompt decision making without requiring approval from JTF Marawi and to integrate SOF efforts under one command.

Phase 3 – The Final Push: The Main Battle Area and Neutralization of HVTs

By Phase 3, most of the buildings and infrastructure in Marawi and the surrounding areas had already been cleared and secured. The main battle area had been defined and the HVTs and some other enemies had been trapped in the constriction area, located in the southwest corner of the city.[47] JTF Marawi underwent further refinement in preparation for the concluding push across the MBA. JSOTF Trident provided more focused C2 to synchronize the combat efforts of the different SOF JTGs within the MBA. JTGs operating under OPCON of JSOTF Trident were deployed to encircle the enemy and secure points that would give the government forces an advantage over the enemy.[48]

In Phase 3, the decision was made that JTG Musang would assume the central role in the overall plan to neutralize the HVTs and remaining combatants. JTGs Vector and Tiger were to conduct support operations, destroying enemy reinforcements and holding ground in the sectors assigned to them. JTG Lawa (maritime) was tasked to seal the constriction area from the south to contain the enemy and prevent them from escaping through Lake Lanao, as well as to block the entry of reinforcements and supplies coming from the south to the MBA. The primary weakness during this phase was around the misemployment of SOFs. Typically, SOFs operate in a small force and deploy for a short period of time.[49] However, throughout the battle, SOFs were overutilized and overexposed. It would have been better to deploy conventional forces, particularly infantry battalions, as the main effort.

The death of Isnilon Hapilon and Omarkhayama Maute on 16 October 2017 marked the end of the 153-day terrorist foothold in Marawi. The killing of HVTs, however, stirred disagreements among operating units over whose

sniping team was responsible for neutralizing Hapilon. Those disagreements underscore the fact that internal competition and a lack of cohesive thinking among operating units have a detrimental effect on military competency. The day following the elimination of the HVTs, Marawi City was declared "liberated" by President Duterte. Nonetheless, the fighting continued and some of the remaining terrorists still held hostages. The PNP even sent a negotiator for the release of the remaining hostages in the area while clearing operations continued.[50] Former Defence Secretary Delfin Lorenzana formally proclaimed the end of combat operations in Marawi on 23 October 2017.[51]

Capability Build-Up: Insights from Marawi

The need to develop capabilities for urban warfare has never been more imperative. The Battle of Marawi serves as an excellent case study, offering valuable insights and lessons that can be identified and applied in relevant contexts. As the events unfolded, it became evident that certain factors favoured the defenders while others favoured the attackers. As noted by Knight and Theodorakis, fighters who have local knowledge, familiarity with the terrain and sophisticated weaponry present a problem that cannot be solved by military leadership and training alone.[52] The Maute clan and Abu Sayyaf Group held an advantage as the fighting took place in their home town and they were equipped with high-powered weapons such as rocket-propelled grenades.[53]

The following are some key observations related to the necessary capabilities for urban operations:

1. **Equipment is key:** It is worth noting that in the Marawi battle SOF were utilized more heavily than the conventional forces because the former were better equipped. In particular, SOF were notably more effective at night because they had night-fighting gear. Due to a lack of other forces employable for CQB, in this scenario the SOF were misemployed. Rather than assigning the main effort to infantry battalions, the SOF were also sub-optimally deployed to secure buildings, perimeters and checkpoints throughout the area. Moreover, throughout the campaign the infantry units were given minimal training for urban operations, which are typically highly personnel-intensive; thus, additional troop strength was a necessity. To augment personnel, Ready Reserve Units were activated to secure checkpoints and the perimeter. In addition to the need for more personnel, it was equally crucial to equip troops with basic force protection equipment, night-fighting equipment and modern machine guns to ensure the high readiness of infantry battalions for urban warfare.
2. **Combat engineers are crucial in urban warfare:** During the battle, the AFP became cognizant of the importance of combat engineers for mobility, counter-mobility and survivability in urban warfare. Usually, engineering units in the Philippine military are employed for construction purposes instead of performing combat missions. The 500th Engineer Combat Battalion (ECB) was newly activated at the onset of the battle and played an important role in breaching concrete walls of buildings, conducting search and clear operations and enabling the movement of firepower platforms.[54] The 500th ECB also conducted road-clearing tasks, allowing ground troops and manoeuvre forces to pass through. As the newly activated combat engineer unit lacked mission-essential equipment, the unit members were compelled to innovate in order to accomplish their mission. Wooden planks were used as ramps and to provide force protection for combat engineers who drive bulldozers, armoured personnel carriers, backhoes and pay loaders.[55]
3. **Uncrewed Aircraft Systems as a Game-Changer:** UASs have emerged as a transformative capability to enhance intelligence, surveillance and reconnaissance (ISR), as well as target acquisition.[56] Commercial uncrewed aircraft were used by both friendly and enemy forces. Friendly UAVs were marked to distinguish them from the enemy's.[57] During the Marawi battle, the US and Australia provided Orion surveillance aircraft that offered real-time target identification updates to personnel on the ground. Later on, the AFP was able to acquire Scan Eagle UASs from the US to support ISR for future operations. With that, the use of uncrewed aircraft became a regular feature in AFP military operations.

CONCLUSION

The Battle of Marawi and the experiences of the AFP offer valuable insights for military planners worldwide, serving as an instructive case study. Marawi highlights the challenges that armies face when operating in an urban setting, especially using their existing capability—particularly materiel and equipment. Often, the current kinetic capabilities prove relatively ineffective in urban settings, requiring more munitions and causing substantial infrastructure and collateral damage.[58] It serves as a crucial reminder that conflicts in an urban environment come with significant costs. Needless to state, the remnants of the devastating war in the heart of Marawi persist.

With the rate of urbanization in the country, it is highly likely that future wars will be fought in cities. The global trend toward urbanization is evident in the Philippines as well. It is one of the fastest-growing countries in the

world, and its population is projected to reach 141.7 million by 2040.[59] Manila, which has a population of 13.7 million people, is the most populated city in the Philippines and is considered the densest city in the world, and cities in the southern Philippines such as Davao and Cagayan de Oro are also experiencing rapid urbanization.[60] These patterns indicate that future attacks are likely to occur in cities, leading to potentially high civilian casualties.

In light of the operational environment and the presence of militants, military planners in the AFP and other armed forces should pay attention to the lessons gleaned from Marawi. The event serves as an opportunity for introspection and eventually for the development of capabilities for waging urban warfare effectively. As discussed in this article, some of the key takeaways include the need for highly accurate intelligence that is integrated across all units. Attention must also focus on equipping units with a high number of personnel, all with adequate capabilities/skills and with the proper equipment. As noted above, the AFP's inclination to establish new units rather than improve existing defence systems proved counterproductive, as that approach failed to address the issue of operational readiness and equipping military personnel for modern-day urban battles. Lastly, the events in Marawi also caution us against adopting a heavily service-centric mentality, as it obstructs the development of jointness and the culture that fosters it. In conclusion, these insights underline the urgent need for militaries to prioritize urban warfare, adapt military strategies and comprehensively train their soldiers for the challenges of tomorrow's battlefield.

ABOUT THE AUTHOR

Ann Bajo is a Ph.D. candidate at the University of Portsmouth researching Malaysia's role in the Mindanao and Pattani conflicts. Her area of interest is defence and security in Southeast Asia. Ann Bajo was a former Division Chief at the Office of the Presidential Adviser on Peace, Reconciliation and Unity. Prior to that, she worked in the Armed Forces of the Philippines as a Defence Analyst for eight years. She has written several internally published works, including "Challenges to Military Operations in Urban Terrain in the Philippines," "China's Military Militia and the Philippines' Counterstrategy" and the AFP Joint Special Operations Doctrine.

ENDNOTES

1. Charles Knight and Katja Theodorakis, "The Marawi Crisis—Urban Conflict and Information Operations," *Australian Strategic Policy Institutes*, July 2019, https://ad-aspi.s3.ap-southeast-2.amazonaws.com/2019-07/SR%20141%20The%20Marawi%20crisis.pdf?VersionId=YzEpTfa5fthzq5DiDuORsFFRYcJZGoz5.

2. Adolf Garceron, "Urban Warfare: Lessons Learned from the Marawi Crisis," *Calhoun*, June 2020, 133.

3. Carmela Fonbuena, "Zamboanga Siege: Tales from the Combat Zone," *Rappler*, September 2014, https://www.rappler.com/newsbreak/68885-zamboanga-siege-light-reaction-battalion/.

4. Carmela Fonbuena, "Naval Detachment to Rise from Zambo Siege Ground Zero," *Rappler*. August 2014, https://www.rappler.com/nation/65269-zamboanga-siege-naval-detachment/.

5. Ibid.

6. "FM 3-06.11 Combined Arms Operations in Urban Terrain," Washington, DC: Headquarters Department of the Army (February 2002): 1-3.

7. Joseph Franco, "The Battle for Marawi: Urban Warfare Lessons for the AFP," *Security Reform Initiative*, October 2017, The-Battle-for-Marawi-Part-2-Franco-Final-SRI-Working-Paper.pdf.

8. Vicentico Quirante, "The AFP Intelligence Community's Role in the Fight Against Terrorism," *Calhoun*, June 2020, 26.

9. Ray N. de Lima, "The Persistence of Terrorism: A Case Study of Mindanao," Master's Thesis, Naval Postgraduate School, https://apps.dtic.mil/sti/citations/AD1150913.

10. "Marawi City Crisis: After Mission Report 23 May–23 October 2017," *Armed Forces of the Philippines*, October 2017, 7.

11. Ray N. de Lima, "The Persistence of Terrorism."

12. "Marawi City Crisis: After Mission Report 23 May–23 October 2017," 8.

13. "Video shows militants, Hapilon in Marawi Siege plot." Posted on YouTube, 6 June 2017, https://www.youtube.com/watch?v=_o4BgGS070Q.

14. Franco, "The Battle for Marawi: Urban Warfare Lessons for the AFP."

15. Ibid.

16. Garceron, "Urban Warfare," 14.

17. "FM 3-06.11 Combined Arms Operations in Urban Terrain," Washington DC: Headquarters Department of the Army, February 2002, 1-3.

18. Neil Morales and Tom Allard, "The Maute Brothers: Southeast Asia's Islamist 'Time Bomb,'" Reuters, June 2017, https://www.reuters.com/article/us-philippines-militants-maute-idUSKBN19302Q.

19. Ibid.

20. "Marawi City Crisis: After Mission Report 23 May–23 October 2017."

21. Garceron, "Urban Warfare. ".

22. Ibid., 14.

23. "Marawi City Crisis: Lessons for AFP Joint Operations," *Armed Forces of the Philippines*, 2017.

24. "Marawi City Crisis: After Mission Report 23 May–23 October 2017."

25. Garceron, "Urban Warfare," 12.

26. Ibid.

27. "Marawi City Crisis: Lessons for AFP Joint Operations."

28. Quirante, "The AFP Intelligence Community's Role in the Fight Against Terrorism," 56.

29. "Proclamation No. 216 – Declaring a State of Martial Law and Suspending the Privilege of the Writ of Habeas Corpus in the Whole of Mindanao," Pub. L. No. Proclamation No. 216 (2017), https://www.officialgazette.gov.ph/downloads/2017/05may/20170523-PROC-216-RRD.pdf.

30. "Urban Military Operations: The Philippine Experience," *OSSSM Digest* 23, no. 1 (2018), 21.

31. Ibid., 22.

32. Ibid.

33. Ibid.

34. "Lessons from Marawi: A Strategic Assessment of the 2017 Marawi Siege," *The Fleet-Marine Warfare Center*.

35. Knight and Theodorakis, "The Marawi Crisis," 15.

36. Ibid.

37. "Marawi City Crisis: After Mission Report 23 May–23 October 2017," 45.

38. Ibid., 44.

39. Ibid.

40. "Joint Publication 3-0 Joint Operations," *United States Joint Forces Command*, August 2011.

41. "Lessons from Marawi, " 65.

42. Ibid.

43. James Lewis, "The Battle of Marawi: Small Team Lessons Learned for the Close Fight," *The Cove*, November 2018, https://cove.army.gov.au/article/battle-marawi-small-team-lessons-learned-close-fight.

44. "Urban Military Operations: The Philippine Experience," 18.

45. "Lessons from Marawi," 80.

46. "Urban Military Operations: The Philippine Experience," 18.

47. *"AFP Joint Operations During the Marawi City Crisis Lessons Handbook*," Armed Forces of the Philippines.

48. Ibid.

49. Derek Eaton, Angel O'Mahony, Thomas Szyna and William Welser, "Supporting Persistent and Networked Special Operations Forces (SOF) Operations: Insights from Forward-Deployed SOF Personnel," RAND, 16 October 2017, 13, Supporting Persistent and Networked Special Operations Forces (SOF) Operations: Insights from Forward-Deployed SOF Personnel | RAND.

50. Garceron, "Urban Warfare," 95.

51. "Lessons from Marawi."

52. Knight and Theodorakis, "The Marawi Crisis."

53. "Urban Military Operations: The Philippine Experience," *OSSSM Digest* 23, no. 1 (2018), 26."

54. "Marawi City Crisis: After Mission Report 23 May–23 October 2017," 25.

55. "Urban Military Operations: The Philippine Experience," 20.

56. Ibid., 27.

57. "Lessons from Marawi," 68.

58. Tabitha Tan Yuen Li, "Urban Guerilla Warfare: A War of Nerves," 2nd ed., 2017, CreateSpace Independent Publishing Platform: US, 27.

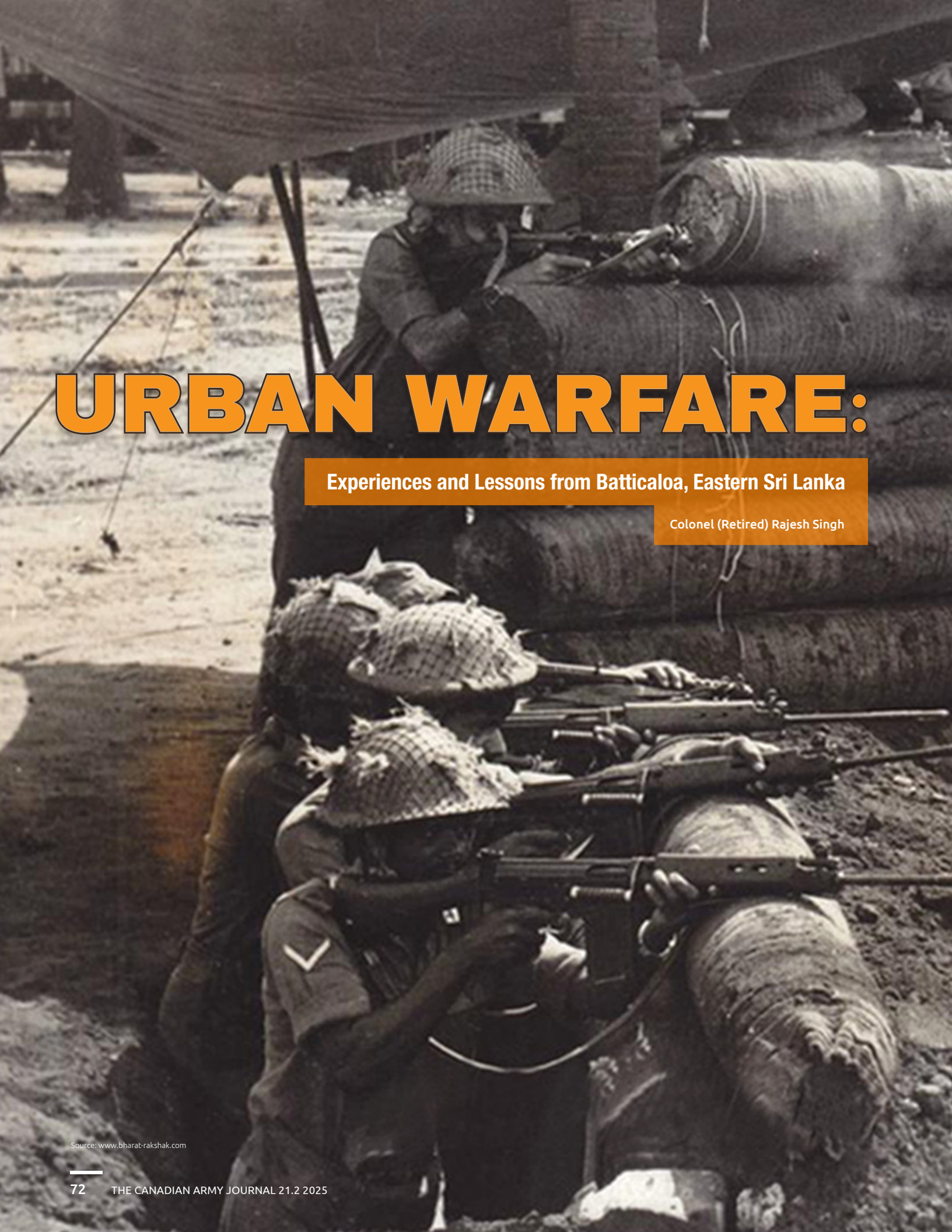
59. "Urban Military Operations: The Philippine Experience," 10.

60. Ibid.

URBAN WARFARE:

Experiences and Lessons from Batticaloa, Eastern Sri Lanka

Colonel (Retired) Rajesh Singh



Source: www.bharat-rakshak.com

BACKGROUND

Ethnic tensions and the rise of Tamil separatism

In its post-colonial history in South Asia, Sri Lanka (formerly Ceylon) had predominantly evolved as a Sinhalese Buddhist state. However, substantial minorities that included ethnic Tamils and Muslims inhabited the northern and eastern regions. Many Tamils were brought to the island during British colonial rule to work on tea plantations. Over time, demands for greater agency in local affairs and autonomy from the Tamil community transformed into calls for an independent Tamil Eelam, covering the northern and eastern provinces. By the 1980s there were several active and armed Tamil secessionist groups. Eventually, the Liberation Tigers of Tamil Eelam (LTTE) emerged as the dominant force led by its iconic leader Velupillai Prabhakaran. The LTTE consolidated power by eliminating rival groups and became the central figure in the demand for a Tamil homeland.

Decades of ethnic tension between the Sinhalese-majority government and the Tamil minority who faced discrimination and marginalization led to a violent struggle, attracting international attention. With its ethnic and cultural ties to the Tamil population, India intervened diplomatically throughout the 1980s, which made it an emotive and politically sensitive issue. The LTTE also received political and material support from Western countries, driven by humanitarian concerns and a desire to prevent the oppression of minorities. Also, India advocated for greater devolution of power and autonomy to the Tamil-majority provinces, a stance formalized in the India–Sri Lanka Accord of 1987. This agreement led to the deployment of the Indian Peace Keeping Force (IPKF) to the island nation, marking a significant chapter in the conflict.

Deployment of the IPKF to Sri Lanka

The IPKF was a contingent of the Indian Army deployed under the India–Sri Lanka Accord and was tasked with overseeing the implementation of the agreement, maintaining peace, and assisting the Sri Lankan Army in securing the surrender of LTTE weapons. Notably, the division-sized force was not meant to undertake combat operations. While the LTTE did surrender some of its weapons, it retained most of the sophisticated arms and ammunition. Prabhakaran felt betrayed by New Delhi's intervention and opposed the provisions of the India–Sri Lanka Accord. As a result, the group waited for an opportunity to launch violent actions against both the Indian and Sri Lankan armies. When the LTTE launched a series of attacks against the

There is no doubt that a lightly armed and equipped infantry soldier is more effective than one burdened with heavy gear.

Source: www.bharat-rakshak.com

security forces that also resulted in civilian casualties, the IPKF was caught off guard. Prior to the outbreak of hostilities, most of the areas outside IPKF camps had been heavily mined by the LTTE, leading to heavy initial casualties for the Indian Army. However, the Indian forces quickly adapted and, by the end of their deployment in 1990, when the IPKF had grown into a formidable force of five divisions, the LTTE had been largely pushed onto the defensive. Despite this, the IPKF's withdrawal in 1990 reinvigorated the LTTE and led to a resumption of the civil war. This conflict continued until Prabhakaran's death in May 2009, exacting a heavy toll on both sides.

URBAN OPERATIONS IN BATTICALOA

A personal narrative

This narrative is based on operations conducted by the author as a rifle company commander in the urban environment of Batticaloa (eastern Sri Lanka), where he served with the IPKF during Operation Pawan (1987–1990). The author has selected incidents that are both instructive and serve as a benchmark for operations in complex, high-intensity environments. While the LTTE is utilized as a professional example, the intent is not to comment on the political or ideological nature of the group, but rather to shed light on the complexities of urban operations and to provide professional insights that can be applied to any adversary in similar operational conditions. The author seeks to highlight the challenges faced during urban operations, particularly the advantages that an invisible adversary—whether termed as a terrorist, militant or insurgent—may have, and how to negate them.

Even at the time, there were many manuals and counter-insurgency schools that taught arious tactics and techniques for urban operations. The author has had no disagreement with those resources. However, when it came to operations in the urban environment of Batticaloa, the author's focus shifted to understanding the local geography—both the

physical terrain and the people living within it—as the key determinant for success. As violent engagements and improvised explosive devices (IED) became more prominent, the author found little use for the pamphlets that had been provided as essential reading for operations in such terrain. The reason was simple: those pamphlets were written within idealized conditions, which quickly became less relevant the moment the first shots were fired or an IED was detonated.

The author participated in operations across both sea and jungle terrains, but those two geographical contexts will only be discussed insofar as they impacted operations in the urban environment. The Batticaloa district itself spanned 2,854 square kilometres and had a population of approximately 400,000 in the 1980s. The town of Batticaloa extended 10 km in the north–south direction and 5 km in the east–west. On the east lies the sea, and to the west are the lagoons and jungles, thus constituting the ingress and egress routes into the urban environment for the militant. The spread and varying density of the population inside the town (which was upwards of 70,000 people in 1987) was the key terrain—the battlefield, a space for contest between the militant and the counter-insurgents.

Lesson 1: Separating the militant or insurgent from the population requires multiple units

Before entering an urban environment as large as Batticaloa, a large-scale force—such as two brigades or a full division—should ideally conduct cordon and search operations. This serves not only to separate insurgents from the local population but also to prevent the urban area from becoming a stronghold, bastion town, or launching point for further operations within or beyond the area.

However, the battalion did not have the luxury of such numbers at that time. The first division-sized combined arms search and destroy operations were only possible in February 1988, five months after the battalion's initial induction, when three additional divisions were deployed to the north and east. The challenge of operating with insufficient forces raised critical questions about how the lack of numbers affected the operations and what alternative strategies could be employed in such circumstances. Referring to T. E. Lawrence's well-known observation that insurgencies are fueled by a small percentage of active insurgents within the population, it becomes evident that both insurgents and counter-insurgents will naturally vie for control of urban environments where the majority of the population resides.[1] Therefore, counter-insurgency operations must ideally begin by targeting urban centres and expelling insurgents from these areas with units large enough to complete the task.

Source: www.bharat-rakshak.com

Lesson 2: Urban operations require high numbers of personnel within those units

Building on the earlier observation, a key aspect in understanding the nature of these operations is the changing context from the battalion's initial induction to its eventual de-induction. Initially, the battalion was part of a brigade, which included three battalions and covered an area stretching from Punanai in the northern part of Sri Lanka to Ampara in the south, a distance of 115 km. This brigade was part of a single infantry division deployed for operations in the north and east of Sri Lanka. However, as resistance stiffened and operations did not achieve the desired momentum and results, three additional divisions were deployed to increase operational efficiency in the region. This shift in scale is significant, as the number of forces involved can heavily influence decisions regarding the scope and approach to urban operations.

If you do not have the personnel numbers, there are adequate spaces available to the insurgent to execute offensive operations. The enemy may be all-pervasive and initiate the "everywhere and anywhere" phenomenon. We were soon to feel the impact of this challenge. On 20 October 1987, an IED detonated on one of the roads leading into the urban area, killing 21 soldiers from a neighbouring rifle company as they traveled in vehicles. The inability to clear the urban centre and areas around it as a result of a paucity of numbers allowed freedom of movement to the LTTE, who surreptitiously planted an IED under a culvert.

Lesson 3: Circumvent the IED threat

The threat of IEDs posed a significant and persistent danger to operations, making it crucial to develop effective strategies to detect and neutralize this threat before it could inflict casualties or disrupt missions. Prior to the detonation on 20 October 1987, the insurgent had dug an IED into the muddy-soft side of the culvert and laid a wire hundred metres away from the spot, using the tall lagoon grass for concealment. Once the vehicle was on top of the culvert, the insurgent manually activated the IED.

The incident highlighted critical vulnerabilities in operations security and prompted a revision in tactics. It became clear that, before any vehicular or convoy movement, troops on the ground had to not only look for the IED but also the location of the person who would activate it. In response, the author implemented a standard operating procedure that involved having an engineer representative along with an assistant, a radio operator, and two escorts. They moved along the road with electronic detectors to locate any IEDs. Meanwhile, the rifle company—at the section or platoon level, depending on the length of the road—would advance 200–300 metres on either side to flush out any insurgents waiting in ambush.

The IED blast brought a heightened sense of caution to operations. From that point on vehicles would only be used in emergencies or as load carriers for logistics and would be escorted by walking personnel flanking the convoys. This

approach came to be known as "walking convoys" and remained in place until February 1988, when additional personnel were brought in. Despite the challenges, the principle that infantry is safest on foot proved to be true, both then and now and regardless of the available numbers. This brings us to another critical aspect of operational agility.

Lesson 4: Employ the agility, mobility and the effectiveness of dismounted infantry

There is no doubt that a lightly armed and equipped infantry soldier is more effective than one burdened with heavy gear. For example, a soldier equipped with a Kevlar helmet, personal weapons and ammunition, body armour protecting the front and crotch, and small-arms protective inserts for the front, back, and sides, carries a total weight of around 60 pounds. In any operational context—whether it be area domination or a search and destroy mission— a soldier carrying 60 pounds would prefer vehicular mobility over dismounted mobility. However, it is also evident that, despite the weight, a dismounted soldier is often safer and more effective in operations, both in urban environments and jungle terrain.

Given that the battalion's area of responsibility spanned the entire Batticaloa and Ampara districts—which covered a distance of 110 km from Punanai in the north to Ampara town in the south—the importance of lightly armed, dismounted infantry became critical. This approach proved vital in operations such as performing road-opening from Punanai to Ampara, carrying out rail-opening from Punanai to Batticaloa, securing vulnerable areas, and conducting search and destroy missions, cordon-and-search operations, multiple patrols, area clearance operations, and intelligence-based operations, which included nighttime operations. In such large, IED-infested terrains, it was clear that vehicle-borne columns would not have been safe or effective. Likewise, heavily burdened infantry could not have operated continuously, day and night, with the same level of safety and effectiveness.

Lesson 5: Approach and move through towns in multiple "rods"

Although the battalion was initially thin on the ground and the LTTE was omnipresent in the town, the latter was likely spread thin as well and numbered in the dozens rather than the hundreds. Like the battalion, the LTTE could not be strong everywhere. Understanding the mindset and tactics of the insurgents, it became clear that they would also be concerned about being outflanked or surrounded. As a result, the author's method for operating within urban environments was straightforward: never advance in single file. Instead, the approach was to advance towards a target or objective in multiple "rods" of foot infantry spread across 400–500 yards. This strategy ensured that LTTE snipers or hit teams would always have their flanks threatened. While they could take a shot or two, they risked being cut off and neutralized. This created caution and doubt in the insurgent's mind, often forcing them to hold their fire.

Lesson 6: Exercise strict fire control
In an urban environment, it was very difficult to locate the exact point from where fire had been opened by the insurgent. Bullets always appeared to be aimed at you and made sounds that appeared to come from all directions, which tended to impose extreme caution. So, in response to a few shots, if every soldier in the section, platoon or company thought that they had been fired at, the complete section joined the firefight, inadvertently disrupting their own fire-and-move tactics meant to neutralize the insurgent threat.

On 26 January 1988, the rifle company stationed on Puliyantivu Island in Batticaloa was targeted in a heavy fire assault by the LTTE. Simultaneously, the LTTE surrounded a nearby police station and set fire to some shops in the vicinity. The commanding officer ordered the company to locate and neutralize the LTTE hit teams immediately. This required neutralizing the insurgents already firing at the company from multiple directions, then moving out of the company operating base and crossing over into the affected area through the only causeway that linked the island to the police station and surrounding areas. Drawing from past experience, the author anticipated that the causeway would be targeted if his company tried to cross it. As a result, a platoon was tasked with crossing the lagoon in boats to close in on the LTTE forces surrounding the police station.

Using effective fire-and-movement tactics, the platoon endeavoured to close the distance with the insurgents, with the light machine gun group covering the movement of the rifle section and vice versa. However, when they reached the point where the LTTE assault had originated, the position was abandoned. The platoon continued to move, shifting from one suspected insurgent position to the next, only to find each one similarly empty, despite enduring continuous fire. After several hours of this, the platoon had covered several square kilometres but still failed to establish contact with the LTTE.

As the platoon moved further, their efforts became painfully slow because of the heavy volume of fire. It was only after a few hours that the author realized the situation was more complicated: not only were the LTTE firing on their position, but other rifle companies from their own battalion stationed at the periphery of the operational area were also inadvertently engaging their troops—a case of "blue on blue on red" fire. The operation eventually culminated, but not before roughly 90,000 rounds were fired by the companies on the periphery. By contrast, the author's platoon in direct contact with the LTTE had only fired 200–300 rounds.

This experience underscored the critical importance of fire control, especially in an urban environment. Uncontrolled fire not only impairs and jeopardizes lives and one's own operations, it puts civilian lives at risk and also allows the insurgents to escape. In such environments, strict fire control is paramount to success.

Lesson 7: Conduct raids and selective cordon and search/destroy operations
In large-scale cordon and search operations, it was easy to lose the element of surprise, unless the objective was to simply flush out the insurgents and separate them from the population. In contrast, selective cordon and search operations in an urban environment involved less troop movement and left the insurgents guessing about the exact geographical limits of the cordon. This confusion encouraged them to seek refuge on the periphery of the cordon, where a cleverly positioned ambush could yield significant results.

In one such selective combined-arms search and destroy operation in Chantiveli, a satellite urban centre of Batticaloa, two insurgents were killed. Another selective cordon and search operation led to the capture of a key insurgent who provided vital information that resulted in raids on jungle hideouts and the recovery of a large cache of arms and ammunition.

One of the most significant outcomes of these selective cordon and search operations was the capture of the top LTTE leadership in Batticaloa during an important operation led by the author. This operation was based on intelligence provided by an informant, "Victor," the LTTE's finance secretary, who had been captured inside Batticaloa town. Victor was responsible for collecting taxes, and the author was able to surprise him with two vehicles approaching from opposite directions. While driving a light vehicle—a jeep—the author fired a few bursts near Victor's feet to prevent him from running and was able to capture him before he could escape.

When intelligence was reliable and good, a raid had to be planned with the minimum number of troops required to achieve surprise and maintain strict fire control—both in terms of movement and shooting. Speed of action and rapid movement left the enemy with few options, forcing them into a one-on-one confrontation. In one such raid, the author's team of just seven personnel established contact with the insurgents, blocked their exit, and initiated a firefight. The operation resulted in the death of four insurgents, including a leader named Arjun.

Lesson 8: Focus on terrain and flexibility in operational art

The urban concentration of Batticaloa was bordered by jungles to the west and the sea to the east. Ideally, all three geographical zones should have been treated as one unified area. Like a balloon, if pressure was applied to one point, it expanded in other directions. With sufficient forces, the entire geographical expanse would have to be controlled, and resources/numbers applied in unison. However, without the necessary numbers, applying force within the urban environment alone would have allowed insurgents to escape into the jungle or, to a lesser extent, the sea. A few strategically placed ambushes in the jungle, aligned with other urban operations, would have helped in making contact with insurgent groups attempting to flee. Still, it became clear from experience that, while some insurgents operated within the urban areas, large, organized groups—particularly from northern Sri Lanka—operated within the jungles.

To address this, the author sought and received permission from the commanding officer to launch operations in the adjacent jungle with the full rifle company. Knowing the insurgents' numerical superiority, the company was deployed with two platoons forward, each platoon moving in two sections, with the rifle company headquarters positioned between and behind the two platoons. After an hour or two of movement through the jungle, the company came across a river. The author immediately halted the company and initiated river crossing drills, which drew heavy automatic fire from the two extremities of the company's advance.

By adhering to rigid fire and control and fire and movement practices, the company was able to avoid walking into an ambush, and inflicted doubts in the mind of the insurgents about their potential for being outflanked. Despite these measures, the intensity and duration of the automatic fire continued. Based on this, the commanding officer agreed with the author's assessment that the insurgents were in far greater numbers and that continued engagement would likely lead to heavy casualties. As a result, orders were received to suspend the operation. This experience demonstrated the importance of flexibility in operational planning. If the insurgents had been blocking the approach to a critical area or passage, the operation would have continued. However, since the column was preparing to withdraw to its base within the urban area, the insurgent group could be dealt with more effectively in a different manner at a later time.

CONCLUSION

This article has focused on key lessons from operations conducted within the urban areas of Batticaloa. The lessons identified in the article are critical for understanding the specific implications, impacts, and conclusions drawn from urban operations. It is evident that, with well-trained, lightly armed, and agile forces—whether dismounted or in vehicles—the results achieved can far exceed the resources invested. Creativity, imagination, and fearlessness are essential qualities for a commander, who must continually assess both the strength of the insurgent and their own forces before force application, and the manner in which force is applied.

The author takes great personal satisfaction from leading the rifle company during this period. The company earned 14 out of the 25 gallantry awards bestowed on the battalion and, remarkably, there were no casualties during the nearly two years of deployment (1987–89). Ensuring peace in Batticaloa by denying the LTTE the space to target civilians and minorities was deeply rewarding. The stabilization of the area around Batticaloa and Ampara even ensured the smooth conduct of elections, forming another success story.

Sometimes outnumbered, sometimes not, the company never felt outclassed. Soon after de-induction, it became apparent that political objectives may not have been fully met. However, military objectives were clear and successfully pursued. The primary goal was to engage the enemy—often unseen—and, when contact was made, ensure that they did not escape. The insurgent may not have a clear front, sides, or rear, but tactical manoeuvring helped create flanks and locate the enemy. Ultimately, this approach resulted in success and, in the author's view, victory.

ABOUT THE AUTHOR

As a captain and subsequent field major in the Indian Army, Rajesh Singh commanded two rifle companies of the 2nd Battalion of the Maratha Light Infantry, as well as a composite rifle company formed from sister infantry battalions in Operation Pawan (1987–89). He was awarded the Yudh Seva Medal (War Service Medal) for displaying outstanding leadership of a high order in numerous high-intensity operations. He later commanded the same battalion as a colonel in a counter-insurgency environment followed by its deployment to a super high-altitude area along the Tibetan Plateau.

ENDNOTES

1. T. E. Lawrence, *Seven Pillars of Wisdom: A Triumph*, (London, United Kingdom: London Jona-than Cape, 1935).

The People's Liberation Army and New Technologies in Urban Warfare

Jesús F. Román García

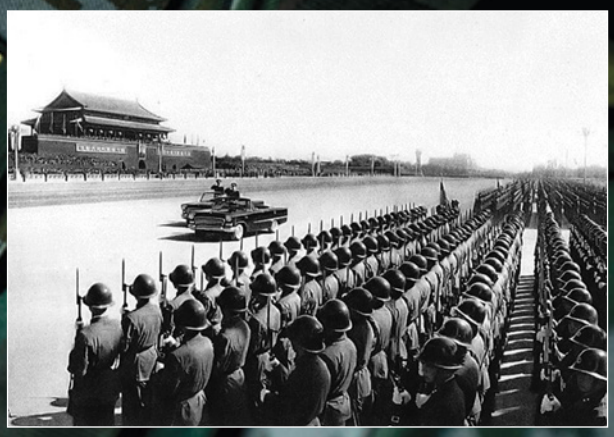
INTRODUCTION[1]

Historically, the Chinese People's Liberation Army (PLA) has had experience with urban warfare but has not seriously invested in it. However, in recent decades, it has dedicated significant resources to developing local technologies and capabilities to address operational gaps. Central to this effort are new technologies such as uncrewed systems, which the PLA views as essential for filling these gaps. This article[2] will explore the technological advancements made by the PLA and assess how effectively they have been translated into real-world combat capabilities for urban warfare operations. The article contends that, although the PLA has extensively tested uncrewed systems, these technologies have not yet matured to the point where they can be fully integrated into operational use. Drawing on publicly available training exercises and data, the author will also analyze the technologies that the PLA is incorporating into urban engagements and assess their success.

HISTORICAL EXPERIENCES AND DOCTRINAL EVOLUTION

The PLA has a long history with urban operations, but it lacks recent combat experience. Needless to state, the lack of experience remains a weakness when it comes to facing the urban challenges of the 21st century. The PLA gained significant experience in urban combat initially during the Second World War (1939–1945) and later against the Kuomintang during the second phase of the Chinese Civil War (1945–1949). In many instances, the PLA's uncontested or near-total control of the rural areas allowed them to move troops and outmanoeuvre their opponents around cities, rather than engaging them in direct combat.[3] This historical background has broadly influenced how the PLA approaches the issue.[4] The outcomes of the Korean War (1950–1953) also reduced the need for a comprehensive review of the PLA's approach to urban warfare. This experience reinforced its focus on manoeuvring around cities rather than on fighting within them. This is evident in the limited attention historically given to urban combat scenarios in the PLA's doctrinal publications.

People's Liberation Army troops assault Nationalist positions on Hill 203, on the Yijiangshan Islands.



China's 10th anniversary parade in Beijing, 1959.

Source: Wikipedia

This approach shifted slightly after the failures of the Sino-Vietnam War (17 February–6 March 1979), particularly the difficult conquest of Lạng Sơn City. In this campaign, the PLA was forced to enter and advance into enemy territory through narrow, restricted routes blocked by cities. The Vietnamese cities had become formidable strongholds, making it difficult for the Chinese troops to bypass them, and they had to be taken by force. While this experience led to reforms in some areas, it did not fundamentally alter or transform the PLA's approach to urban operations. Urban areas were still avoided when possible, or surrounded and defeated through manoeuvre warfare, thus continuing to overlook the critical challenges of urban combat.[5]

Some significant PLA reform took place after the Persian Gulf War (17 January–28 February 1991). The PLA was particularly impressed by the role of the American-led coalition's information technologies, command and control, and precision weapons in the conflict.[6] The PLA recognized that they were falling behind their adversaries and, consequently, the Central Military Commission urged greater collaboration between domestic civilian and military industries as well as academic research departments through the Chinese Military-Civil Fusion Strategy.[7] This initiative aimed to develop technological solutions to address their joint and combat limitations.

Despite this, urban warfare remained largely absent from the most relevant or higher-level PLA doctrinal publications and had little influence on the PLA Guidelines or joint doctrinal releases.[8] However, in recent years, there appears to be an evolution in PLA doctrinal thought, shifting from a manoeuvrist approach to a more realistic one.[9] This shift is particularly evident in the lower levels of doctrinal publications.[10] For example, the *Science of Campaigns* (2006) seems to move away from the manoeuvrist approach and recognize the attritional nature of urban warfare along with its high logistical demands, the need for force concentration, and the specialization required for such operations.[11]

This evolution may be attributed to the growing realization within the PLA that, due to the scale of urbanization in the region, urban areas have become an unavoidable reality for modern armies. From the PLA's perspectives, there are two situations where they could get involved in urban operations. As the military of the Chinese Communist Party (CCP), its primary focus is on ensuring the survival of the CCP and maintaining internal stability. Although the People's Armed Police (PAP) would play a central role in these efforts, the PLA would provide support at all levels, especially in terms of counter-insurgency operations in cities of the Autonomous Regions of Xinjiang and Tibet. The second most likely urban campaign scenario for the PLA would be a possible invasion of Taiwan, which would involve several key assumptions.[12] In this scenario, the PLA would be unable to avoid Taiwan's urban sprawl, therefore requiring it to penetrate and manoeuvre within built-up areas. As a result of this realization, the PLA has been looking to adapt its strategies and capabilities to effectively address these challenges.

Despite the changes and evolution in recent decades, large-scale urban combat operations continue to be viewed by the PLA as highly undesirable and to be avoided whenever possible. The PLA tends to delegate small-scale urban combat to its special operations forces and PAP units, on which it heavily relies. In the event of a potential invasion of Taiwan, the PAP is expected to assist with pacification, stability operations and rear-area security in urban areas. They are unlikely to be involved in frontline combat but could take part in low-intensity operations or prolonged urban sieges.[13] This approach reflects a certain optimism about the limited-scale operations that the PLA anticipates, while creating a significant capability gap within their forces.

From a doctrinal point of view, the PLA is still working through the latest Western urban warfare debates and concepts, with clear achievements remaining uncertain. A significant gap persists between what the PLA claims they intend to do on the battlefield and what they can actually execute. This is also true for their urban warfare capabilities, where the PLA has developed offensive and defensive operations with Chinese characteristics, though they still feel incomplete.[14] However, this gap is narrowing with each passing day.

NEW TECHNOLOGIES AND URBAN WARFARE

After the 1990s PLA reforms, new technologies including uncrewed weapon systems gained more traction in the Chinese approach to warfare. Within the PLA, there was growing recognition that their existing information and reconnaissance systems were insufficient and that they required reliable large-scale systems and enhanced command, control, communications, computers, intelligence, surveillance and reconnaissance capabilities.[15] They began to view uncrewed and autonomous systems as central to their force transformation, which could potentially help them adapt to conditions of modern war/conflict against peer-to-peer opponents.[16] Given the dispersed nature of urban combat, these technologies are viewed as critical enablers to achieve local or overall superiority without relying on traditional manpower—particularly in a Taiwan scenario.[17] Overall, the PLA believes that uncrewed systems will allow commanders to carry out more ambitious combat missions in contested spaces and complex urban terrain with minimal casualties.[18] This mindset is evident in the growing push to integrate uncrewed aircraft systems (UAS) and uncrewed ground vehicles (UGV) supported by artificial intelligence (AI).[19]

As noted by Chinese scholars who focus on the challenges of urban combat, using uncrewed, AI-powered weapons, called "intelligentized" systems, can provide an advantage in future urban battles.[20] These systems could range from smaller uncrewed air vehicles (UAV) for covert missions to self repairing platforms that can fix themselves during combat.[21] They also argue that UAVs or UAV swarms would work together to gather intelligence and provide a full picture of the enemy, further improving tactics in complex urban environments.[22] This assessment holds merit and is well reflected in the trends observed in the PLA's modernization efforts, particularly concerning urban warfare.

Source: Wikipedia

Guizhou WZ-7 Soaring Dragon.

Uncrewed air vehicles

The PLA's integration of UASs across multiple domains, including urban warfare, underscores its emphasis on precision strikes and enhanced reconnaissance capabilities.[23] The adoption of UASs also aligns with China's focus on asymmetric warfare, minimizing casualties while maximizing operational flexibility. This section examines how the PLA approaches the employment and utility of UASs/UAVs across strategic, operational and tactical levels.

Strategic level

In recent decades, the PLA has also significantly improved its strategic reconnaissance and strike capabilities using UASs that will conduct deep reconnaissance and strategic strikes.[24] In urban operations within contested areas, China is likely to employ a combination of surface-to-air missiles (SAM), man-portable air defence systems (MANPAD system), and medium-altitude long-endurance (MALE) uncrewed combat aerial vehicles (UCAV). MALE UCAVs have extraordinary-guided firepower capabilities, but they would be limited when heavy ordnances are required— for example, in reinforced concrete building areas such as Taiwanese high-density urban environments.[25] To a limited extent, PLA may also include attack and reconnawissance MALE UVAs to support ground forces with precise firepower and guided munitions, thereby reducing the risk of exposure of crewed aircraft.[26]

Since the capabilities at the strategic level may degrade during urban operations (given the nature of the operations), the PLA would likely balance this limitation by increasing the number of UASs at the tactical level. To illustrate, it has already demonstrated the effective use of UASs for high-value targets, and it will rely on smaller UASs and even deploy them with long-range artillery systems. Similarly, the PLA is equipped with the SR-5 modular Multiple Launch Rocket System (akin to the M142 High Mobility Artillery Rocket System) that is capable of deploying loitering munitions.[27] This system would prove valuable for the PLA in urban warfare for counterbattery fire against Taiwanese (HIMARS), targeting strongpoints, or striking critical infrastructure and logistics.

Source: ODIN

Sharp Claw I is a small, tracked scout robot designed to be carried in the cargo bay of the larger Sharp Claw II.

The Sharp Claw II Chinese 6x6 uncrewed ground vehicle is designed for a variety of roles, including reconnaissance, surveillance, combat engineering support, logistics and combat.

Notably, China's urban operations would involve meticulous intelligence assessments at all levels, which would be greatly facilitated by their existing operational UAS.[28] There is strong evidence to suggest that the PLA intends to use UASs en masse to enhance their intelligence, surveillance, target acquisition and reconnaissance (ISTAR) capabilities during urban campaigns in both small and large-scale operations.[29] It would also opt for lesser known technologies, such as uncrewed tethered balloons, to enhance ISTAR in urban areas, similar to Aerostat sensors that can be deployed as area umbrellas in urban environments.[30]

Despite efforts to integrate these intelligent systems throughout their units, it is uncertain how effective the PLA's operational joint capabilities are, especially given that other more central systems are still not fully integrated.[31] Despite its weaknesses, the PLA's reconnaissance system appears to be on par with those of many less advanced NATO members, which is cause for concern. That noted, it has yet to deploy its uncrewed systems en masse for large-scale urban operations. Although the PLA has not yet reached this level of maturity, it is important to understand their current capabilities, goals and aspirations.

Operational level

At the operational level, UASs are essential to the PLA's artillery brigades, with each brigade possessing a dedicated UAS company for reconnaissance, targeting and damage assessment.[32] They have decades of experience training with medium-sized UASs and have mastered their use.[33] Notwithstanding that, some models such as the ASN-205 UAV are outdated due to early overinvestment in inferior designs.

For effective urban combat, the PLA has been focusing on their reconnaissance battalions, each equipped with a UAS company and a few uncrewed aircraft.[34] These UASs are frequently used in training to guide rockets, missiles and artillery systems like PHL-16 and PHL-03 MLRSs, as well as truck-mounted and self-propelled howitzers (conducting day and night operations). They have also featured in beyond visual line of sight strikes with systems like the Z-10 attack helicopter that they are beginning to train for urban environments.[35] These UASs are a critical part of the PLA ground forces' distant reconnaissance capability and possess an operational range of 100 km–200 km, which may be deployable from mainland China. If these systems are well coordinated and integrated during urban operations, they have the potential to deliver devastating firepower and pose a significant challenge even for NATO forces.

Additionally, the PLA has strengthened its logistical and strategic capabilities with the establishment of the PLA Strategic Support Force to enhance its performance in urban combat operations.[36] During intense combat operations with restricted logistical mobility, UASs can be highly effective in supporting infrastructure operations and delivering critical supplies, such as emergency medical materials, essential food and water, specialized anti-tank or MANPAD systems, munition, and critical spare parts, especially in relatively inaccessible urban areas.[37]

Although not adopted yet, these tasks could be undertaken with rotary wing vehicles, such as the F-500 vertical take-off and landing (VTOL) UAV or with the TB0D Scorpion UAV, which can deliver up to 1.5 tons of cargo.[38] These capabilities would cover the "last mile gap" within the PLA hybrid pull and push logistic system. However, it is difficult to assess their effectiveness when they are not used en masse.

Tactical level

To enhance flexibility at the tactical level, the PLA has moved away from rigid unit structures, especially in urban warfare.[39] Their high-mobility combined arms battalions are equipped with organic UASs for reconnaissance, air defence and combat engineering, making them well-suited for urban operations.[40] However, the PLA also forms ad-hoc tactical combat groups that include smaller units at the company and section levels with additional uncrewed systems.[41]

Tactical intelligence during urban engagements would come primarily from SOF units, which use UASs and small UASs for reconnaissance, targeting and raids.[42] SOF units tend to rely on hand-launched UAVs, commercial off-the-shelf (COTS) UAVs, and micro-copters, while tactical reconnaissance units deploy fixed-wing aircraft such as the ASN-15 or CH-801, along with COTS VTOL UASs.[43] These systems usually have a range of 10 km and an endurance of 60–90 minutes, are equipped with optical sensors and work in tandem with vehicle-mounted sensor masts in low density urban environments.[44]

In recent years, the PLA had already advanced in using uncrewed systems at the tactical level, as illustrated with the widespread use of commercial small UAVs like the DJI manufactured Mavic series. These are commonly deployed with light military vehicles, such as the ZBL-08 infantry fighting vehicle (IFV) or Dongfeng, for rapid urban penetration during hasty assaults with limited force investment and limited risk in early stages of the conflict. SOF units are regularly seen training with these systems for raids, counter-insurgency and antiterrorism operations.[45] The PLA has also commissioned specialized quadcopters to provide urban terrain support, particularly for ground troops.[46]

One of the key capabilities that the PLA is developing for urban warfare is its tactical-level strike capabilities with UASs. China intends to use uncrewed systems en masse and swarms to create a revolutionary way of war within cities. Although they lack sufficient kinetic explosive payload, the PLA appears to rely on loitering munitions—either individually or in waves—to compensate for the lack of fire support and precision during urban engagements. If effectively integrated with their ISTAR systems, these capabilities could result in serious challenges to adversaries by raising the lethality of their forces to levels that would be increasingly difficult to counter.

The most promising systems have yet to be adopted. Notably, the CETC swarm loitering system (mounted on a Dongfeng Mengshi 6x6 CTL181A vehicle) can deploy 48 loitering munitions in waves or swarms.[47] NORINCO's system can launch 18 loitering munitions similar to the American Switchblade 600, making it effective against armoured and specialized vehicles in urban offensive or defensive campaigns.[48] Additionally, PRC companies have developed UASs like the CH-901/FH-901 loitering munition that are designed for urban warfare.[49] This system would offer a flexible, low-risk option to target lightly-protected targets quickly and increases the chances of success in rapid advances.

Uncrewed ground vehicles

It remains unclear what uncrewed ground vehicles (UGV) have been used and to what extent they are integrated within China's armed forces. In general, it seems that UGVs are reduced to experimental training, which limits their overall operational impact. Most UGVs observed during PLA exercises have been developed in collaboration with the National University of Defense Technology (NUDT, 中国人民解放军国防科技大学), which acts as an intermediary between the defence companies and the PLA in line with the Military-Civil Fusion Policy. Typically, the PLA pushes requirements and the companies deliver potential solutions that are tested, trained and adopted if proven successful.

Given its quest to stay ahead of adversaries and integrate UGVs into its combat capabilities, PLA-associated university research bodies have been organizing various tournaments to test and evaluate different UGV solutions for specific scenarios. An example of this is the Beijing Crossing Obstacles 2016 (*跨越险阻2016*) competition, where one of its five categories was urban battlefield reconnaissance, highlighting the challenges UGVs face in such environments.[50] Another example is the Unmanned Competition-2022 (*无人之竞*-2022), which was developed in training areas designed to resemble urban settings.[51]

While most of these experimental UGVs were abandoned, reflecting a "fail fast, fail cheap" approach, some have been further developed as export models, which are typically showcased at commercial events like the Zhuhai Air Show.

The UGVs showcased at these events span a wide range of technologies, from modular platforms such as the THeMIS UGV to explosive ordnance disposal specialized systems of varying sizes and capabilities, as well as platforms for heavy automatic fire or reconnaissance.[52] Some commercial systems, such as the DJI "Robomaster S1" and the Hongshun Defense "Blood-Wing" robot dog, have been used by the PLA in counterterrorism and counterinsurgency exercises.[53] However, none of these systems have been adopted, and similar types have been discarded by NATO forces, suggesting they likely do not enhance PLA warfighting capabilities. Such products serve as valuable benchmarks for technical specifications and provide insights into the state-of-the-art capabilities of PRC defence companies. They also help offset future system development and production costs.[54]

Similarly, several systems for medical evacuation (MEDEVAC) or logistical purposes have been showcased by China Central Television (CCTV) over the years, but it appears the PLA has not chosen to adopt most of them.[55] Wounded soldier evacuation has been observed employing medium-size tracked armoured UGV ambulance and heavy lift VTOL UASs.[56] It is unclear how integral these are to the PLA's core tactics, techniques and procedures (TTP) during urban operations, but they have not been widely implemented across the force.

The PLA has been experimenting with logistical capabilities that could be valuable in urban engagements, such as in Taiwan. UGVs have been demonstrated for heavy vehicle maintenance, while exoskeletons have been used to carry loads and assist in field repairs of combat vehicles such as tanks.[57] The Joint Logistic Suspport Force has been observed to employ exoskeletons alongside UGVs in field training. On other occasions, exoskeletons have been used to support medical recoveries in combat exercises together with crewed vehicles that are equipped with cranes for urban MEDEVAC missions.[58] In the demanding urban environment, exoskeletons could alleviate the physical combat stress of PLA soldiers and enhance their ability.

Other technologies

To reiterate, the Chinese leadership has been fostering closer integration between the military and civilian sectors and is leveraging support from various domestic entities. For instance, Chinese industries have developed systems to enhance squad-level urban reconnaissance and strike capabilities, some inspired by Western technologies. For example, the HD66 corner gun, which is based on the Israeli CornerShot, is used in urban combat exercises and by the local police forces but has not yet been inducted in the PLA.[59] Bulky "see-through-wall" radar systems have been observed during PLA urban training exercises but may soon be replaced by smaller commercial bi-dimensional or three-dimensional radar systems.[60] The PLA has also experimented with various remote weapon systems (RWS), but these have not been adopted yet.

While some of these commercial systems could be useful in smaller engagements, such as a protracted counterinsurgency urban campaign in Taiwan or counterterrorism operations in Xinjiang or Tibet, they lack the operational depth needed for large-scale urban combat operations. This trend reflects the overall approach of the PLA: significant resources were invested in developing UASs in the early 2000s, only for many to be rendered suboptimal due to rapid technological advancements.[61] Given the extensive experimentation and training, it is reasonable to assume that the PLA is waiting to achieve optimal capabilities before committing to mass production. While this may limit short-term capabilities, neglecting this process could eventually lead to operational surprises when the more effective systems are eventually adopted, especially as the PLA will likely enjoy the initiative in any engagement with Taiwan and be able to accommodate the tempos of their technological developments accordingly.

PLA URBAN WARFARE TRAINING & UAS: INTEGRATION AND SHORTFALLS

In this section, different urban warfare training exercises involving UASs and UGVs are analyzed to assess how well the PLA trains for urban environments with uncrewed systems and whether their efforts to integrate new technologies are proving effective. Unfortunately, in the author's view, there is not enough data to make a fully informed assessment but, based on the available information, some preliminary conclusions and general trends can be drawn.

The drills analyzed in this section are based on a series of urban combat exercises involving UASs, UGVs, and other technologies showcased in Chinese media over recent years. Most of these exercises were conducted by PLA ground force units from the 71st, 72nd, and 73rd Group Armies (GA), although not exclusively. Notably, these GAs are located in the Eastern Theatre Command located directly west of Taiwan, which clearly shows the intent of such training as a deterrent. Similar training and facilities are much less common in other Theatre Commands. More detailed information on the training content can be found in Table 1.

As analyzed by the author, PLA training exercises typically focus on squad- or section-level TTP. Company-level urban assaults—an optimal training focus—are relatively rare. The emphasis of the exercises remains at the tactical level, and while armoured vehicles are sometimes incorporated, there is limited combined arms training, particularly in terms of coordination with infantry and artillery. Interestingly, some of the former urban training exercises have featured more realistic integration of armoured vehicles and training in urban environments that were often conducted in real cities with abundant vehicles and debris, which expectedly enhanced the realism of the exercises.[62]

Date	Location	Units	Relevance
11/2010	Tianjin, Jinnan District (around 38.991051, 117.464075)	Unknown unit (Armoured brigade)	- First urban assault exercise showcased in the media. - First coordination exercise utilizing UAVs as intelligence, surveillance and reconnaissance (ISR) tools. - Effective collaboration between heavy armoured fighting vehicles and mechanized infantry. - Realistic training environment (exercise conducted within an existing city), with plenty of rubble and fire. - One of the few instances of combined arms training above company level, featuring a large number of armoured vehicles, including tanks, mechanized infantry, aviation, surface-to-air missile systems, assault operations, and flamethrowers.
01/2011	Zhurihe Training Base (42.240124, 112.741046)	Unknown unit (Armoured brigade)	- The only video without UASs, UGVs, or new technologies, highlighting the contrast with newer videos. - Coordination between infantry and Type 59 tanks, flamethrowers, various light vehicles including sidecar motorbikes, quads, and a Mil Mi-8 helicopter vertical assault. - Notably the only urban assault exercise involving a significant civilian presence (at least 19 individuals). - Chemical, biological, radiological and nuclear training was included.
09/2020	Dongshi Village Training Grounds, Northern Jiangsu (34.4609, 118.4942).	73rd GA Brigade unit	- Confrontational exercise. - Very low-density urban environment. - DJI Robomaster S1 UGV and sUAS used to support the urban assault approach. - Flexible periscope camera sensor to view under door thresholds. - Sniping training included for urban assault scenarios. - Training on deficient urban movement TTP.
05/2021	Tactical Training Ground in Northern Jiangsu (34.460264, 118.494219)	72nd GA	- Confrontational exercise involving motorized assault units with at least 12 IFVs. - Specialized breaching vehicles used to clear avenues of approach. - CH-801 tactical UAVs employed for reconnaissance. - Suboptimal sniping techniques observed. - Unrealistic high-intensity assault tactics on buildings noted. - Two commercial DJI sUAVs and a medium-sized commercial quadcopter with optical sensors used in formation for reconnaissance, with a DJI sUAS flanking the quadcopter to coordinate aerial infiltration. - Within the built-up area, ground-level reconnaissance conducted by a DJI Robomaster S1 in the highest-density zone. - While smoke was visible during the exercise, rubble and obstacles were absent. - DJI Robomaster S1 was used by troops before a building assault. - COTS sUAVs were used not only for external but also for in-building reconnaissance before assaults. - sUAVs employed as attack vectors against target individuals inside buildings. - Breaching techniques were practiced, but no uncrewed systems were involved in the exercise. - Other urban training techniques included smoke concealment with grenades and vehicle smoke, armoured infantry movements, building and armoured breaching, and coordination with support squads in multi-story buildings.
05/2021	Taonan Training Ground in Jilin (45.108780, 122.740641)	82nd GA Brigade unit	- At least five armoured vehicles used in the assault: one tank, one reconnaissance vehicle with a sensor mast, and three armoured personnel carriers/IFVs. - Fixed-wing CH-801 UAV utilized for reconnaissance before a helicopter vertical assault (two Z-18 medium-lift transport helicopters).
12/2021	Training Ground in Eastern Guangdong (23.718900, 116.884319)	73rd GA Combined arms (CA) battalion	- Military march formation assault on an urban strongpoint with mechanized infantry and Type 90/Type 92 IFVs. - Sensor masts used to support the assault as ISR tools. - Quadcopter UAVs deployed for reconnaissance and force protection tasks. - Unrealistic urban assault TTP observed.

Table 1

Date	Location	Units	Relevance
06/2022	North of Weifang (37.030495, 119.296378)	80th GA Brigade	- Low-density training ground with adapted shipping containers, featuring at least two IFVs, two tanks, and at least one 122 mm PLL-09 self-propelled artillery vehicle. - Integrated use of quadcopter UAVs for reconnaissance and breaching missions, operated from within protected vehicles. - Other small tracked UGVs and ball UGV camera sensor devices deployed. - PLA-standard see-through-wall radar device utilized. - Flexible periscope camera sensor used to view under door thresholds. - Fire support coordinated with assault troops, mast sensor-equipped vehicles, and self-propelled supporting vehicles during the exercise.
06/2022	Unknown	80th GA CA Brigade unit	- Not an urban training ground, but relevant for urban assaults involving uncrewed systems. - KVD001 UAVs (a variant of the JWP02) used for distant reconnaissance prior to the assault. - Unknown mine-clearing UGVs employed to clear a corridor through an area reportedly filled with obstacles and mines. - Quadcopters used to deliver explosive charges against fortified positions. - "Robot-dog" UGV seen following dismounted troops. - Wheeled UGV used to deliver supplies to the lines of communications and serve as a MEDEVAC vehicle. - Small, low-profile tracked remotely piloted vehicle used for close reconnaissance, with a larger wheeled platform featuring an RWS used to cover the approach during a trench assault.
10/2022 and 11/2022	Tactical Training Ground in Northern Jiangsu (34.460264, 118.494219) and (28.263534, 113.041875)	73rd Group Army CA unit plus (likely) a National University of Defense Technology (NUDT)'s infantry section	- Experimentation with various uncrewed aerial and ground reconnaissance vehicles from the School of Intelligent Science at the National University of Defense Technology (NUDT). - Testing of uncrewed logistic platforms and vehicles capable of following tracks, avoiding road obstacles, and trailing manned vehicles driven by AI without a remote pilot, assisted by AI. - Confrontation exercise (Red and Blue teams, with the Red team defending) in an urban environment, supported by different experimental UGV platforms and sUAVs at the squad/section level. - The exercise does not involve live fire. - DJI Mavic 2-type sUAV used as the primary reconnaissance tool. - Arm-mounted ruggedized tablets (integrated combat system) displaying integrated information and a battlefield management system, with two remotely piloted UGVs deployed for engagement. - A tracked and a wheeled experimental basic UGV equipped with basic camera sensors and antitank weapons shown. - Additional footage shows various uncrewed vehicles, including a Dongfeng light vehicle, navigating obstacle-free tracks, automatically piloted by AI.
12/2022	Guoguoyuan Training Ground in Nanjing (32.082569, 118.932436)	71st GA Brigade unit	- Offensive and defensive drill conducted. - Uncrewed system training in a low-density peri-urban environment. - Aimed at enhancing technological capabilities within a new light CA experimental squad unit. - sUAS used to deploy a smoke curtain before the assault. - Various expendable small logistical UGVs and UAVs employed to supply combat units with medical and munitions. - Quadcopter UAVs used to drop supplies and cover the movement of supply UGVs. - Supply dropping training performed with sUAVs. - Multiple-storey building assaults trained with the HD66 "corner gun," accompanied by two optical-sensor small tracked UGVs preceding the assaults. - Two breaching (likely commercial) UGVs observed clearing avenues of approach, one of which appears to be the XCMG Group's XSR180M system, which seemed to lose a track during the exercise. - Virtual urban environment training techniques demonstrated, including UAV piloting, targeting exercises, and building modelling.

Date	Location	Units	Relevance
04/2023	Dongshi Village Training Grounds, Northern Jiangsu (34.4609, 118.4942).	160th Heavy CA Brigade, 71st GA	- Urban assault conducted by a section/platoon-size CA assault force. - Assault supported by two antitank teams protecting infantry and vehicles, and destroying strongpoints. No machine guns were observed. - Suboptimal use of sUAVs for reconnaissance support missions. - Coordination between ZBD-86 IFVs and infantry. Although the unit includes ZTZ-96 tanks, they were absent. - Notable comparison of debris and dirt evolution in the training ground compared to the 09/2020 exercise (see above), with mock obstacles and fire in avenues of approach. The clearance of these obstacles was practised. Indoor debris appeared more prevalent than in previous exercises. - Infantry squad TTP practised at team, squad, and platoon levels. - Narrow avenues of approach, with assaults through buildings using windows and assuming easy conquest of buildings and higher floors. Unrealistic and overly simplified building assault TTP observed in some sections. - Internal building assault TTP showed clear improvements compared to previous exercises. - High presence of sights and a high ratio of assault gun-mounted grenade launchers, typically absent in these exercises. - Radio communications within buildings practiced, allowing infantry units to relay information to units outside the built-up area. - Further reconnaissance support requested from a nearby armoured reconnaissance unit, equipped with a mast sensor. - A 3D cartographic tool was shown, though it lacked any battlefield management system or command and control features. - Smoke was used during the assault, primarily for performance effect rather than to conceal the assault.

Overall, the PLA appears to have relegated urban combat operations solely to the PLA Ground Force (PLAGF). During trainings, one rarely sees much integration of assets or capabilities from the PLA Air Force (PLAAF) or PLA Navy (PLAN) for urban operations, such as close attack support or naval assistance in joint urban assault exercises. Within the PLAGF, coordination between combat units even above the section level is equally rare. For instance, combined arms training—incorporating infantry, armoured vehicles, and artillery support—during urban assaults remains uncommon. These capabilities are typically trained in conventional settings without the complexities of urban environments, which may greatly hamper their effectiveness in real-world urban combat scenarios.

The PLA has only significantly developed doctrine and trained for joint and multi-domain operations over the past decade, looking to integrate all its command, control, communications, computers, intelligence, surveillance, and reconnaissance systems through its Joint Theatre Command. However, it remains uncertain whether this integration has been successful. Much of the focus has been on high-end systems, particularly from the PLAN and PLAAF. During urban operations, this coordination will be more challenging, and some conventional capabilities may be limited. Most of the progress in addressing these challenges appears to have been made at the tactical company or battalion level, where the PLA has substantial uncrewed assets.

Although China has developed a variety of new urban training grounds, these are often suboptimal for several reasons.[63] Many are simply areas with empty buildings, lacking any real features of an urban environment. It appears that the environment is treated more like open terrain than a realistic urban setting. As a result, their soldiers may be training for unrealistic scenarios. For example, essential components such as supply infrastructure are completely absent from urban combat scenarios. These grounds are typically clean and sparse, with few obstacles, dirt or rubble—factors crucial when training with UGVs, which face limitations like degraded datalink communication. Furthermore, the PLA has not conducted urban combat training in inhabited cities for years, and civilian presence is never included, unlike in Taiwanese exercises.[64] One of the few examples of real city defensive TTP training comes from the Urban Militia, which is not part of the PLA. They have conducted air defence exercises against loitering munitions attacks over urban critical infrastructure and deployed air balloons to counter UASs in light of the Russian bombing campaign in Ukraine.[65]

On some occasions, the PLA has effectively increased the built-up density of training grounds by using modular adapted shipping containers.[66] However, in other areas such as virtual training or simulators, this approach has not been applied. The PLA's virtual indoor facilities and simulators for urban environments, including systems like the 120 mm PF98A or HJ-12E antitank simulators (similar to the FGM-148 Javelin)

were showcased in isolation.[67] While these systems are ideal for joint training, integration and cooperation with other units, such integration was not demonstrated, adding little value to their urban training capabilities.

Another notable aspect when analyzing PLA exercises is its need for close fire support. It seems that the PLA has recognized a gap in close fire support within their units. To address this, they have been experimenting with urban warfare composition squads and incorporating small reconnaissance UAVs for tactical support and high levels of explosive firepower, such as antimaterial rifles and sniper automatic grenade launchers.[68] This clearly shows that the PLA has realized the increased need for enhanced squad firepower during tactical urban engagements. Such squads exemplify the PLA's approach to squad fire support and highlight their preference for explosive weapons in urban environments over automatic gunfire. In some exercises, it has been observed that antitank teams cover the advance of forces or serve as the primary means to destroy fortified positions, even in situations involving armoured vehicles.[69]

It is interesting to note that heavy and medium machine guns are typically missing from these exercises. Generally, even with motorized or mechanized forces, there is a lack of machine gun support either from the assault vehicles or the dismounted infantry. This may help explain why most of the UGVs focus on automatic fire support. Insufficient automatic fire support could be interpreted as a weakness that the PLA units would need to address during urban operations.

The PLA has experimented with UGVs in the urban environment with mixed results. While they offer tactical solutions to certain challenges, particularly in low-intensity scenarios such as breaching, mobility, counter-mobility, and reconnaissance tasks, they are sometimes suboptimal and seldom improve the PLA's overall urban warfighting capabilities.

The analyzed exercises reveal that UASs and UGVs are commonly employed during urban training. It is not uncommon to see IFVs supported by sensor masts to enhance reconnaissance of buildings. The PLA has been using UASs for reconnaissance during urban assaults for at least a decade, making it reasonable to assume that they are well versed in these TTP.[70] Quadcopter UAVs are also used for reconnaissance and force protection tasks, operating both inside and outside vehicles.[71] Many commercial off-the-shelf (COTS) UASs, such as the DJI Mavic 2 UAV, are frequently seen in these exercises.[72] In some cases, COTS and non-COTS systems are used together during aerial infiltration reconnaissance missions, each fulfilling different roles and complementing the other.[73] Other tactical UASs, such as the fixed-wing CH-802 UAV, are also frequently used in tactical reconnaissance prior to urban raids and vertical assaults.[74] Quadcopters are also employed to deliver explosive charges against fortified positions. Additionally, other operational-level systems, such as the KVD001, have been seen employed for distant reconnaissance at higher echelons.[75]

Uncrewed last-mile logistical and MEDEVAC operations are other areas where the PLA have invested considerable effort. In urban combat scenarios, quadcopter UAVs and UGVs have been used to drop and bring supplies over short distances.[76] However, the limitations in weight capacity and delivery range of these systems make them of relatively low utility in urban engagements. In addition, a variety of other experimental technologies are observed during these urban exercises, including small tracked UGVs, ball UGV camera sensors, periscope cameras for viewing under door thresholds, and see-through-wall radar devices.[77] While these systems appear to be sufficiently mature, the PLA has yet to adopt them on a large scale.

The NUDT has extensively experimented with various less common UGV platforms and small UAVs at the squad and section levels, using them for reconnaissance, fire support, antitank operations and experimental battlefield management systems.[78] In built-up areas, ground-level reconnaissance is typically carried out by a range of experimental and COTS UGVs, such as the DJI Robomaster S1 and BloodWing's robot dog. COTS UASs are also used for reconnaissance in high-rise buildings or as attack vectors against soft targets. Overall, most of these systems appear suboptimal and do not seem to provide the PLA with strong capabilities for high-intensity combat operations.

Without a doubt, one of the most advanced lines of investigation is the use of uncrewed systems for mines and obstacle clearance and breaching missions, which are crucial during urban assaults. Mine- and obstacle-clearing UGVs are normally seen clearing avenues of approach before urban assaults.[79] The PLA not only uses military systems during their experimental exercises but also commercial uncrewed vehicles such as the XCMG Group's XSR180M system.[80] Currently, it is unclear how fully these systems have been integrated into the PLA, but their eventual adoption could significantly reduce casualties and minimize exposure for assault engineers during urban operations.

One of the most interesting systems currently in use by the PLA Airborne Corps is the NORINCO Lynx family, though only in its crewed version.[81] This modular system is based on the all-terrain CS/VP16B Lynx 6×6 vehicle, which can be either manned or remotely piloted, with various modules installed.[82] During urban exercises, it has been seen converted into an uncrewed logistical platform for infantry patrol missions.[83]

CONCLUSION

The PLA has made significant investments in developing its own uncrewed and related systems, but with mixed results. While some of these efforts show promise, others appear disconnected from Western advancements. To expand, although they have seemingly experienced success in incorporating some new technologies, it has not resulted in a significant boost in operational capabilities for large-scale urban operations. Media portrayals often seen in CCTV footage serve more to shape the PLA's internal and external image and should be viewed cautiously. The quantity and quality of most of the graphic content must be taken with some skepticism, as it could obscure real developments, exaggerate realities or misdirect PLA observers.[84]

China has evolved dramatically since the end of its civil war, and the PLA mirrors this transformation. Though the PLA's approach to urban warfare presently remains largely linear, future developments could see changes in this strategy. Trends and incremental changes are already coming to the fore. Currently, the PLA's use of uncrewed systems in urban combat is on par with many NATO forces, but operational success in such environments will depend on the right doctrine, training, mass and coordination. While the PLA may not yet match the U.S. military in urban warfare capabilities, ignoring these trends would be a mistake for NATO forces. Therefore, there is little doubt that the PLA is closely studying the urban warfare lessons from both the Russo-Ukrainian War (2022–present) and the Israeli-Hamas Conflict (2023–present) and will carefully select and seek to adapt them in areas relevant to future operations. Ultimately, the success of PLA operations still hinges on human and political factors, and the role of new technologies and autonomous systems in urban combat remains to be seen. Meanwhile, the PLA continues its doctrinal, operational, and technological experimentation—an ongoing process that demands close attention from all militaries and defence practitioners.

ABOUT THE AUTHOR

Jesús F. Román García is an architect and has a master's degree in Smart Cities. He is the editor of *Ejércitos* magazine and his work has featured in numerous publications. His work has been commended by the U.S. 40th Infantry Division's Urban Warfare Center. @jesusfroman

ENDNOTES

1. The author would like to express his gratitude and thank Ise Midori, Carlos González and Q for their help.

2. This article was completed in 2023. The analysis reflects the state of knowledge and events at that time, and subsequent developments may have occurred by the time of publication.

3. Larry M. Wortzel, "The Beiping-Tianjin Campaign of 1948–1949" in *Chinese Warfighting: The PLA Experience Since 1949*, eds. David M. Finkelstein, Mark Ryan and Michael A. McDevitt (Oxon: Routledge, 2003), 56–73; and Gary J. Bjorge, "Moving the Enemy: Operational Art in the Chinese PLA's Huai Hai Campaign," Leavenworth Paper Number 22 (Fort Leavenworth, Kansas: Combat Studies Institute Press, 2003), 1–5 and 267–269.

4. Sun Wei, "解放四平战斗中的巷战:运用机动灵活战术,以较小代价取得胜利" / "Street Fighting in the Battle of Liberating Siping: Using Mobile and Flexible Tactics to Win at a Small Cost," *China National Defense News*, 2 December 2021, http://www.81.cn/ll/2021-12/02/content_10117003.htm.

5. Henry J. Kenny, "Vietnamese Perceptions of the 1979 War with China," in *Chinese Warfighting: The PLA Experience Since 1949*, eds. David M. Finkelstein, Mark Ryan and Michael A. McDevitt (Oxon: Routledge, 2003), 228–231.

6. Dean Cheng, "Chinese Lessons from the Gulf Wars" in *Chinese Lessons from Others Peoples' Wars*, edited by Andrew Scobell et al., Strategic Studies Institute, US Army War College, 2011, 153–200, JSTOR, http://www.jstor.org/stable/resrep11966.8. Accessed 10 Apr. 2023.

7. For further information, consult: Alex Stone and Peter Wood, *China's Military-Civil Fusion Strategy*, China Aerospace Studies Institute, 15 June 2020, https://www.airuniversity.af.edu/CASI/Display/Article/2217101/chinas-military-civil-fusion-strategy/.

8. This seems to be the case for the 1993 *Local Wars under Modern High Technology Conditions* guidelines, their 1999 first generation of joint doctrine, their 2004 *Winning Local Wars under Informationized Conditions* guidelines, or their latest *Integrated Joint Operations or Joint Operations*. To see further evolution about the PLA's doctrinal publications, specifically the guidelines, consult Taylor Fravel, *Active Defense: China's Military Strategy Since 1949* (Princetown University: 2019).

9. Sun Zhaoli, ed, *The Science of Military Strategy (2013)*, trans. China Aerospace Studies Institute; *In Their Own Words: Foreign Military Thought*, Montgomery, 2021, https://www.airuniversity.af.edu/CASI/Display/Article/2485204/plas-science-of-military-strategy-2013/, 119; Xiao Tianliang, ed, *The Science of Military Strategy (2020)*, trans. China Aerospace Studies Institute; *In Their Own Words: Foreign Military Thought*, Montgomery, 2022, https://www.airuniversity.af.edu/CASI/Display/Article/2913216/in-their-own-words-2020-science-of-military-strategy/, 245.

10. For more information about how urban warfare has been treated, please see Elsa Kania's "The PLA Outlook on Urban Warfare" and Sale Lilly's "0+."

11. Kevin McCauley, *People's Liberation Army: Army Campaign Doctrine in Transition*, Foreign Military Studies Office (U.S. TRADOC), September 2020, https://community.apan.org/wg/tradoc-g2/fmso/m/fmso-monographs/351019, 31–32, 41–42.

12. Such as that the PLA has successfully crossed the Taiwan Strait and set strong enough beachheads to maintain them, and that the PLA can concentrate, maintain, and sustain enough forces to move across the urbanized part of the island.

13. Joel Wuthnow, *China's Other Army: The People's Armed Police in an Era of Reform*. National Defense University Press, 2019, China Strategic Perspectives 14, https://inss.ndu.edu/Portals/82/China%20SP%2014%20Final%20for%20Web.pdf, 39.

14. For more information about "Urban Offensive Campaigns," see McCauley 2020, 31–32, and for "Urban Defensive Campaigns," see McCauley 2020, 41–42.

15. Cheng 2011, 159.

16. McCauley 2020, 9–11.

17. Dennis L. Blasko, *The Chinese Army Today: Tradition and Transformation for the 21st Century*, Routledge, 2006, 113.

18. Lu Xucheng, Chen Bing, and Roug Minshi, "多送部队需要的兵" / "Send more soldiers that the troops need," *PLA Daily*, 21 December 2022, p. 3, http://www.81.cn/gfbmap/content/2022-12/21/content_330244.htm.

19. See more in Jeffrey Engstrom, "Systems Confrontation and System Destruction Warfare."

20. "A Chinese Perspective on Future Urban Unmanned Operations," *Mad Scientist Laboratory*, 17 March 2022, https://madsciblog.tradoc.army.mil/390-throwback-thursday-a-chinese-perspective-on-future-urban-unmanned-operations/

21. *Ibid.*

22. "China: 'New Concepts' in Unmanned Combat and Cyber and Electronic Warfare," *Mad Scientist Laboratory*, 16 November 2020, https://madsciblog.tradoc.army.mil/285-china-new-concepts-in-unmanned-combat-and-cyber-and- electronic-warfare/.

23. See Elsa Kania, *The PLA's Unmanned Aerial Systems: New Capabilities for a "New Era" of Chinese Military Power*, China Aerospace Studies Institute, 2018, https://apps.dtic.mil/sti/citations/AD1082743.

24. For more information about how the PLA integrates reconnaissance in their units, see Chapter 6, "Reconnaissance and security actions" in *ATP 7-100.3 Chinese Tactics*, Army Publishing Directorate, United States Army, August 2021, https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34236-ATP_7-100.3-001-WEB-3.pdf.

25. As an example, TB-001 UCAV could carry up to 12 guided munitions, Wing Loong 1E up to nine or Wing Loong 2 up to eight, with limitations on heavy ordnance loads, for example 500- or 1,000-lb bombs.

26. They would include reconnaissance CH-3 and CH-4A UASs, and attack and reconnaissance CH-4B, CH-5, CH-6, TB-001, Wing Loong GJ-1, GJ-2, WZ-10 or WZ-7 UAVs, among others.

27. Jesus Roman, Twitter, @jesusfroman, 4 November 2022, https://twitter.com/jesusfroman/status/1588486195352592384.

28. ATP 7-100.3 *Chinese Tactics*, Army Publishing Directorate, United States Army, August 2021, https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34236-ATP_7-100.3-001-WEB-3.pdf, 7-59.

29. Elsa Kania and Ian Burns McCaslin, *The PLA's Evolving Outlook on Urban Warfare: Learning, Training, and Implications for Taiwan*, Washington, 2022, 17–18.

30. AVIC has already deployed and tested their AS500 system for tests in the South China Sea (IT House. "我国 AS500 海洋岛礁应用环境浮空平台首次外场升空试验成功" / "China's AS500 floating platform for marine reef application environment has been lifted off successfully in the first field test," *Qingdao Soft Media Network Technology Co. Ltd.*, 10 July 2022, https://baijiahao.baidu.com/s?id=1737976144252170528&wfr=spider&for=pc), while CASIC could offer their YW-1 tethered or JZ-22 or JZ-40 aerostat untethered systems (Hunan Aerospace Co. Ltd., 2014 http://www.hnht.casic.cn/n3351402/n3351459/n3351886/n3353175/index.html).

31. Occasional paper, Royal United Services Institute for Defence and Security Studies, *Modern Russian and Chinese Integrated Air Defence Systems: The Nature of the Threat, Growth Trajectory and Western Options*, Justin Bronk, 22–23.

32. ATP 7-100.3, 2-25.

33. The PLA's employed UASs are ASN-205, ASN-206, ASN-207 and ASN-209 or BZK-005, BZK-006 and BZK-007 and their derivatives or modernizations: JWP01, JWP02 or DCK-006 UAS are used for special support tasks such as TKJ226 as communication relay, RKL167 as decoy or RKL-165 for radar jamming or electronic countermeasure missions.

34. ATP 7-100.3, 2-37.

35. 演兵场/Training ground. "解放军KVD001型无人机曝光: 引导武直'A导B射', 快打快撤" / " PLA KVD001 UAVs Exposed: Provide Guidance for Armed Helicopters, Enable 'A Guided B Shot' and Hit-and-Run Tactics," Military Channel, 1 March 2021, https://baijiahao.baidu.com/s?id=1693011964331711374; Michael Peck, "China's Attack Helicopters Are Preparing for Urban Warfare," *The National Interest*, 24 November 2018, https://nationalinterest.org/blog/buzz/chinas-attack-helicopters-are-preparing-urban-warfare-36702.

36. https://ndupress.ndu.edu/Media/News/Article/1651760/chinas-strategic-support-force-a-force-for-a-new-era/.

37. China Strategic Support, Weibo @中国战略支援, 19 December 2022, https://weibo.com/7774089243/Mkgtuy2Wh; China Aerospace Studies Institute (CASI). YouTube, "CASI webinar on the PLAAF for ACC," min 48:42, https://youtu.be/ZukCJvY8l4s?t=2922.

38. Emma Helfrich, "China's Four-Engine 'Scorpion D' Cargo Drone Has Flown," *The War Zone*, 26 October 2022, https://www.thedrive.com/the-war-zone/chinas-four-engine-scorpion-d-cargo-drone-has-flown.

39. ATP 7-100.3, 1-52.

40. Joshua Arostegui, "An Introduction to China's High-Mobility Combined Arms Battalion Concept," *Infantry*, Fall 2020, https://www.benning.army.mil/infantry/magazine/issues/2020/Fall/pdf/5_Arostegui-HIMOB_txt.pdf.

41. ATP 7-100.3, 4-63 and 4-64.

42. ATP 7-100.3, 2-37.

43. Chen and Wuthnow, 2022, 8; Gao Qiang, "视频: 空降兵跨昼夜实弹射击演练" / "Video: Airborne Troops Live-Firing Exercise Day and Night," CCTV Military Weibo, 4 December 2022, http://www.news.cn/mil/2022-12/04/c_1211706615.htm; China Military TV, Weibo @中国军视网, 6 September 2022, https://weibo.com/tv/show/1034:4810707053772911?from=old_pc_videoshow; ATP 7-100.3, 2-37.

44. China Military TV, Weibo @中国军视网, 6 September 2022, https://weibo.com/tv/show/1034:4810707053772911?from=old_pc_videoshow.

45. They can be seen training at the squad level, in groups of up to ten small UAVs at the same time or during collaborative exercises mixing various types of COTS quadcopters, FPV goggles and tasks, including PsyOps. See more: Military Report, "长着眼睛的子弹 穿越机反恐作战显身手" / "Bullets with eyes: FPV-drone show its capabilities in counter-terrorism operations," JS7TV, 25 February 2022, https://www.js7tv.cn/video/202202_271303.html; Military Report, "海拔4700米 西藏军区多兵种联合进攻战斗演练" / "Multi-Service Joint Offensive Combat Exercise in Tibet Military Region at an Altitude of 4,700 Metres," *JS7TV*, 6 September 2022, min 1:50, https://www.js7tv.cn/video/202209_286845.html; CCTV-7. "[正午国防军事]正午速递 新疆军区某师开展无人机组协同训练" / "[National Defense Military at Noon] Noon Express, A division of the Xinjiang Military Region conducts collaborative training of UAV teams," 12 April 2022, https://tv.cctv.com/2022/04/12/VIDEJfeCuhP7LNJ3uZjQMcVK220412.shtml.

46. Liu Zhen, "China tests killer drones for street-to-street urban warfare, plans sales overseas," *South China Morning Post*, 28 November 2019, https://www.scmp.com/news/china/military/article/3039827/chinese-tech-firm-testing-urban-attack-drone-designed-carry-out.

47. Jon Grevatt, "China outlines technology priorities for 'new era'," *Jane's*, 8 March 2021, https://www.janes.com/defence-news/news-detail/china-outlines-technology-priorities-for-new-era. Jesus Roman, Twitter, @jesusfroman, 26 December 2022, https://twitter.com/jesusfroman/status/1607379196644401157.

48. Emma Helfrich, "Drone Swarm Launcher Truck Displayed at China's Big Arms Expo," *The War Zone*, 5 November 2022, https://www.thedrive.com/the-war-zone/drone-swarm-launcher-truck-displayed-at-chinas-big-arms-expo.

49. China Military Drone Alliance, Rainbow CH-901 Suicide Drone (CH-901 loitering munition), https://www.militarydrones.org.cn/rainbow-ch-901-suicide-drone-china-price-manufacturer-procurement-portal-p00167p1.html.

50. Wang Lujia, ed., "'跨越险阻2016'地面无人系统挑战赛精彩落幕" / "'Crossing Obstacles 2016' Unmanned Ground System Challenge Concluded," *People's Daily Online*, 19 October 2016, http://military.people.com.cn/n1/2016/1019/c1011-28791007.html.

51. 央视军事/CCTV Military, YouTube @user-zu1nk8vy7h, 28 November 2022, https://www.youtube.com/watch?v=VGnP0wxt3lU.

52. 央视军事/CCTV Military, Weibo @央视军事, 16 December 2022, https://weibo.com/6189120710/MjRB2rL91?refer_flag=1001030103; Sohu, "国产最新无人战车" / "The latest domestic unmanned combat vehicle," 15 September 2020, https://www.sohu.com/a/418562538_358040; 军迷天下/CCTV Military Fans, YouTube "解放军新型无人战车亮相 配备多种武器可替代作战人员执行任务「威虎堂20200903|军迷天下" / "The People's Liberation Army's new unmanned combat vehicle is equipped with a variety of weapons and can replace combat personnel to perform tasks, Weihutang 20200903, Military Fans World," 3 September 2020, https://www.youtube.com/watch?v=fVan441GzrQ&ab_channel=%E5%86%9B%E8%BF%B7%E5%A4%A9%E4%B8%8B.

53. Emma Helfrich, and Tyler Rogoway, "China Pairs Armed Robot Dogs with Drones That Can Drop Them Anywhere," *The War Zone*, 5 October 2022, https://www.thedrive.com/the-war-zone/china-pairs-armed-robot-dogs-with-drones-that-can-drop-them-anywhere.

54. Dennis L. Blasko, *The Chinese Army Today: Tradition and Transformation for the 21st Century* (Routledge, 2006), 123.

55. Yang Longxiao and Ge Yuchen, "'上身轻松''知意贴心'……新一代机械外骨骼长啥样" / "'Easy to wear' know the intimate... What does the new generation of mechanical exoskeleton look like?" *PLA Daily*, 9 December 2022, http://81.cn/yw/2022-12/09/content_10204436.htm; CCTV Military, Weibo, @央视军事, 25 November 2022, https://weibo.com/6189120710/MgCBUFCJF.

56. CCTV News, "太行腹地 卫勤尖兵砺戈淬火" / "Hinterland of Taihang, the top soldiers of the medical service are hardened and quenched," 15 December 2022, https://military.cctv.com/2022/12/15/ARTI3RhuGOCrZGy02atrDZGH221215.shtml.

57. CCTV-7, "'国防军事早报' 20220506" / "'National Defense Military Morning Post' 20220506," 6 May 2022, min 11:27, https://tv.cctv.com/2022/05/06/VIDEVUQ43FMne5KZ3LOR8b09220506.shtml.

58. 军迷天下/CCTV Military Fans, YouTube "海量曝光! 直击解放军最新型战地救护装备深入火线 单兵外骨骼未来感十足实现战力突破 新型装甲救护车突破敌火力封锁堪称"移动战地医院" 「国防科工」20201203 | 军迷天下" / "Massive exposure! Witness the PLA's latest field ambulance equipment deep into the fireline; futuristic single-armed exoskeleton to achieve a breakthrough in combat power; new armoured ambulance breaching enemy fire blockade as a 'mobile field hospital'," 3 December 2020, min 7:30–9:46, https://youtu.be/ph8QIundDSY?t=451.

59. 人自伤心水自流/Self-sufficiency, "中国最贵手枪' 拐弯枪'，网友: 它子弹是怎么打出去的？"/ "China's most expensive pistol 'Bend Gun,' Netizen: How does it shoot out the bullets?", Baijiahao, 18 January 2019, https://baijiahao.baidu.com/s?id=1622977764673815849&wfr=spider&for=pc; 军迷天下/CCTV Military Fans, YouTube "'拐弯枪'出其不意 无人车清剿残'敌'! 解放军这场城镇攻防演练曝光大量新装备! 20221209 | 军迷天下" / "'Corner Gun' unexpected, unmanned vehicles to clear the remaining 'enemy'! PLA this urban offensive and defensive exercises exposed a lot of new equipment! 20221209 | Army fans all over the world," 9 December 2022, https://youtu.be/-jK8gp91QMg.

60. Some of the Chinese bi-dimensional radars are Radartone LT-TW01 (Radartone, LT-TW01穿墙雷达 / LT-TW01 through wall radar, http://www.radartone.com/product/723.html) and Aterma DF108 (Aterma, http://www.atermamw.cn/atermamw/products/15603397.html). They also have three-dimensional radars such as ZJSC-LD10 (Shenzhen Zhongjing Sichuang Military Police Equipment Co., Ltd, ZJSC-LD10, https://jjzbcj.com/shengmingtanceyi/425.html), Topsky YSR-120 (Topsky, 穿墙雷达YSR-120/Through wall radar YSR-120, https://www.bjltsj.com/index.php chuanqiangleida/830.html) or the 3D Novasky CEM400 radar (Novasky, Through-wall Detection, https://t.co/6mP8dtDqgR); CCTV News. "直击我军城镇攻防战 拐弯枪 透墙雷达大显身手！" / "Eyewitness our soldiers urban offensive and defensive battle, 'Corner shot gun' and 'Wall Penetration Radar' show their skills!," 24 October 2020, https://v.cctv.com/2020/10/24 VIDECAUMzYq0CZVRP meGVsFs201024.shtml.

61. For example, the early ASN family of UASs.

62. CCTV-4, "[视频]中国军队首次举行装甲旅城市进攻战斗实兵演练" / "[Video] The Chinese Army Holds the First Armoured Brigade Urban Offensive Combat Drill," 17 January 2022, https://tv.cctv.com/2011/01/17/VIDEexRbJ7Ml20AuJkRnVctc110112.shtml

63. To see further information about training grounds, please see Elsa Kania's "The PLA Outlook on Urban Warfare."

64. Phillip Charlier, "Special Ops forces practice urban warfare drill on 505 kilometer long march," *Taiwan English News*, 13 March 2021, https://taiwanenglishnews.com/special-ops-forces-practice-urban-warfare-drills-on-505-kilometer-long-march/.

65. CCTV News, "[新闻直播间]浙江 军地联合人防演练 检验重要目标防护能力"/ "[News Live Room] Zhejiang military-civilian joint civil air defence drill tests important target protection capabilities," 18 November 2022, https://tv.cctv.com/2022/11/18/VIDEm3CTueRxHJKSHIR6et4U221118.shtml.

66. CCTV Military, Weibo, @央视军事, 18 June 2022, https://m.weibo.cn/status/4781766709609693.

67. 军迷天下 / CCTV Military Fans, "航展'追星'（二）：地面武器装备上演"兵器大片'! 新一代激光战车堪称反制无人机利器 多型'山猫"成群突击 极具震撼力!「兵器面面观」| 军迷天下" / "Airshow 'Chasing the Stars' (2): Ground weapons and equipment staged a 'weapon blockbuster'! The new generation of laser combat vehicles can be called a powerful weapon against drones. The multi-type 'Lynx' assault in groups is extremely shocking! 'Aspects of Weapons'," 15 November 2022, min 13:05–13:50, https://youtu.be/BKpSIJvLWTQ?t=776; 军迷天下/CCTV Military Fans, "中国航展上的科技与狠活! 红箭-12E"一发入魂"了解一下! 20221121 | 军迷天下" / "Technology and hard work at the China Air Show! Red Arrow-12E 'one shot into the soul' to find out! 20221121 | Army fans all over the world," 21 November 2022, https://www.youtube.com/watch?v=TKZY0vQV26s.

68. Jesus Roman, Twitter, @jesusfroman, 8 April 2021, https://twitter.com/jesusfroman/status/1380051325325602818.

69. CCTV, [Military Report] "New Era, New Journey, New Greatness – Starting Again from Spring – Strengthening Training in New Fields, Exploring New Growth Areas for Combat Effectiveness," [军事报道]新时代新征程新伟业·从春天再出发 强化新领域训练 探索战斗力新的增长点, 1 April 2023, https://tv.cctv.com/2023/04/01/VIDEwQN1a8Gd4xeSlFYXqW55230401.shtml?spm=C52346.PiumOrlYLNUM.E0VXtwLj8YU7.3; CCTV《National Defense Story》20230215 "Landing and breaking through,"《国防故事》20230215 登陆破阵, 15 February 2023, https://tv.cctv.com/2023/02/15VIDEs8HmJ73hfZ0KHRAfC88e230215.shtml?spm=C53074552346.P9Rgau2BvOJP.0.0, min 11:30–13:00.

70. CCTV-13, "[新闻直播间]陆军 合成营进攻战斗 检验部队作战能力" / "[News Live Room] Army's Combined Battalion tests troops' combat capabilities in offensive battles," 21 December 2021, https://tv.cctv.com/2021/12/21/VIDEKSDMXUZzxcbuxoMl9e9k211221.shtml; China Youth Daily, "解放军装甲旅举行城市进攻战斗作战演练(图)" / "The People's Liberation Army Armoured Brigade Holds Urban Offensive Combat Exercise," Sina News, 9 May 2010, http://mil.news.sina.com.cn/2010-11-05/0936617699.html.

71. CCTV Military, Weibo, @央视军事, 18 June 2022, https://m.weibo.cn/status/4781766709609693

72. 军迷天下/CCTV Military Fans, "海量智能装备亮相! 解放军展示无人装备协同作战 无人侦察机 无人侦察车纷纷出动 信息量极大!「国防故事」| 军迷天下" / "Massive smart equipment unveiled! The People's Liberation Army demonstrates unmanned equipment for coordinated operations, unmanned reconnaissance aircraft, and unmanned reconnaissance vehicles are dispatched one after another. The amount of information is huge! 'National Defense Story'" 6 November 2022, https://youtu.be/T8V8H2Tmthk?t=398.

73. CCTV, "[北京您早]立体渗透 直击第72集团军城镇攻防演练" / "[Good morning, Beijing] Three-dimensional penetration, eyewitness the 72nd Army's urban offensive and defensive drill," 10 May 2021, https://news.cctv.com/2021/05/10/VIDEtki5yaiLAQemPlNTuaUf210510.shtml and CNR Military, "视频 | 直击解放军城镇攻防演练, 有人无人协同作战" / "Eyewitness PLA urban offensive and defensive exercises, manned and unmanned collaborative operations," Huanqiu, 7 May 2021, https://mil.huanqiu.com/article/431bsZNlUmX.

74. CCTV-7, "[正午国防军事]正午速递 第82集团军某旅: 配属新质作战力量开展城镇攻防演练" / "[National Defense Military at Noon] A brigade of the 82nd Group Army delivered at noon: assigned new combat forces to carry out urban offensive and defensive drills," 5 November 2021, https://tv.cctv.com/2021/11/05/VIDEoXdf5kuePdkwNM31f7us211105.shtml.

75. 央视军事/CCTV Military, "来看最新装配的军用机器人! 解放军陆军合成旅用无人装备演练新战法! 陆军第80集团军某合成旅展开全要素合成营实兵对抗演练, 多型无人装备亮相, 开展人装协同训练!" / "Check out the latest assembled military robots! The PLA Army Combined Brigade uses unmanned equipment to practice new tactics! A combined brigade of the Army's 80th Group Army launched a full-factor combined battalion combat drill. Multiple types of unmanned equipment were unveiled, and human-equipment coordinated training was carried out!" 25 June 2022, https://www.youtube.com/watch?v=C3d7d1CKepo.

76. 军迷天下/CCTV Military Fans, "海量智能装备亮相! 解放军展示无人装备协同作战 无人侦察机 无人侦察车纷纷出动 信息量极大!「国防故事」| 军迷天下" / "Massive smart equipment unveiled! The People's Liberation Army demonstrates unmanned equipment for coordinated operations, unmanned reconnaissance aircraft, and unmanned reconnaissance vehicles are dispatched one after another. The amount of information is huge! 'National Defense Story'," 6 November 2022, https://youtu.be/T8V8H2Tmthk?t=398.

77. CCTV Military, Weibo, @央视军事, 18 June 2022, https://m.weibo.cn/status/4781766709609693.

78. 军迷天下/CCTV Military Fans, "海量智能装备亮相! 解放军展示无人装备协同作战 无人侦察机 无人侦察车纷纷出动 信息量极大!「国防故事」| 军迷天下" / "Massive smart equipment unveiled! The People's Liberation Army demonstrates unmanned equipment for coordinated operations, unmanned reconnaissance aircraft, and unmanned reconnaissance vehicles are dispatched one after another. The amount of information is huge! 'National Defense Story'" 6 November 2022, https://youtu.be/T8V8H2Tmthk?t=398

79. 军迷天下/CCTV Military Fans, "海量智能装备亮相! 解放军展示无人装备协同作战 无人侦察机 无人侦察车纷纷出动 信息量极大!「国防故事」| 军迷天下" / "Massive smart equipment unveiled! The People's Liberation Army demonstrates unmanned equipment for coordinated operations, unmanned reconnaissance aircraft, and unmanned reconnaissance vehicles are dispatched one after another. The amount of information is huge! 'National Defense Story'," 6 November 2022, https://youtu.be/T8V8H2Tmthk?t=398.

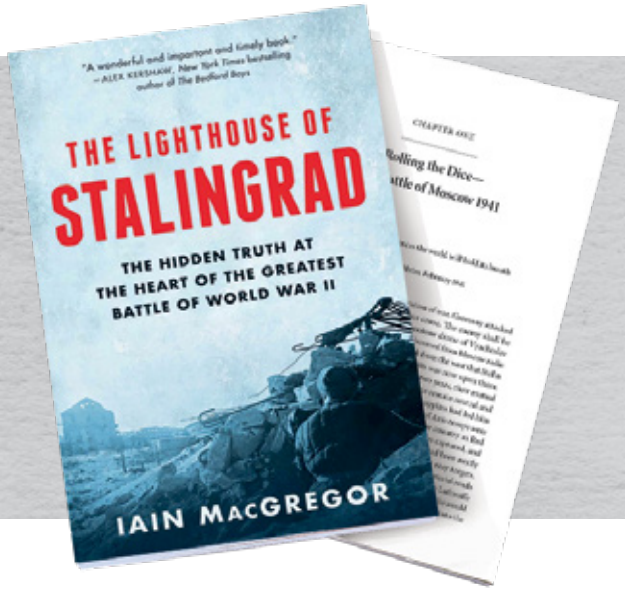
80. XCMG, "超有料!徐工26款"黑科技"亮相中国安博会" / "Super informative! XCMG 26 'black technology' products at the China Security Expo," 28 November 2022, https://www.xcmg.com/xgsc/news/news-detail-1126415.htm.

81. Samuel Cranny-Evans, "China displays family of unmanned Lynx high-mobility vehicles," *Jane's*, 19 October 2021, https://www.janes.com/defence-news/news-detail/china-displays-family-of-unmanned-lynx-high-mobility-vehicles.

82. The modules are: sensor mast, air defence rocket system including radar, a mortar piece, 12-tube rocket battery or automatic machine gun RWS of various calibres with rocket systems. It could also be used as a logistic vehicle with or without a trailer, to transport up to five soldiers, or with a light crane that could be installed on its rear part.

83. CCTV, '"国防故事' 20221028 为战育人 国防科技大学 (2) " / '"National Defense Story' 20221028 National University of Defense Technology (2)," 28 October 2022, https://tv.cctv.com/2022/10/28/VIDEocucWbAhImwXoSBWd9Q8221028.shtml, min 0:00–4:20.

84. Blasko, 2006, 189.



The Lighthouse of Stalingrad: The Hidden Truth at the Heart of the Greatest Battle of World War II

BIBLIOGRAPHICAL INFORMATION:
MACGREGOR, IAIN. New York: Scribner, 2022, 355 pages.
ISBN: 978-1982163587

Reviewed by Major Jayson Geroux, CD, Guest Editor.

"The accepted story of Pavlov's House … describes the intense fight for the building: As the weather turned colder, German infantry, often supported by Panzers, assaulted the house daily, sometimes several times, trying to dislodge the stubborn defenders. They would rush the lower windows incessantly and push the barricades aside, only to be met by everything from withering machine gun fire to chunks of hand-thrown masonry, or they were fought off with a sharpened spade. Stukas dive-bombed from above, destroying the facade and killing many of the garrisons. At one point, they called in pinpoint artillery fire from across the Volga to drive off an attack in the nick of time. Pavlov himself is said to have used an antitank rifle and fired upon advancing armour from the rooftop, to which the Panzers could not elevate their gun, and thus he destroyed up to a dozen during the siege. This is all 'boy's own adventure' and is well written … as well … as recounted in testimonies and letters … in the city's archives. Is it true?"

The 58-day defensive fight for a building that was named after one of its defenders, Sergeant Yakov Fedotovich Pavlov, has become one of the better-known stories from the battle of Stalingrad (23 August 1942–02 February 1943). During and after the Second World War (1939–1945), it developed into an urban legend (pun intended) among military historians in general and in Russian folklore in particular. The defence of "Pavlov's House" became a David versus Goliath fable—some of it recounted by Iain MacGregor in the above excerpt from *The Lighthouse of Stalingrad*—in which Pavlov and a small group of Soviet soldiers fought with only small arms, anti-armour weapons and sometimes their bare hands, in a large building that stuck out like a sore thumb into the German lines on the west bank of the Volga River. For almost two months, Pavlov and his soldiers withstood repeated juggernaut attacks from German infantry and tanks. Despite the overwhelming violence, the building and its Soviet defenders held. Pavlov's house even earned its own codename, "the Lighthouse," during the battle, because waves and waves of German soldiers crashed against the building but could not break it.

However, as Mr. MacGregor asks at the end of the above quotation from his book, is this story true? That question and the book's title pique the reader's curiosity about what the author uncovered in his research when he visited Russia in general and Volgograd (modern-day Stalingrad) in particular in 2020. He was able to visit the archives of the city that hosted the largest battle in modern urban warfare history, and he also gained access to personal and never-before-acquired Russian and German diaries and memoirs of senior officers and soldiers who fought in Stalingrad.

Given the title of the book, I eagerly looked forward to the details. I was anticipating a painstaking investigation that would uncover each of the 58 days in the battle for Pavlov's House and the ordeal endured by Pavlov, his soldiers and the attacking Germans—but I was initially disappointed. Mr. MacGregor has uncovered some surprising details and dedicates two short chapters (Chapter 12 of 19 and the Epilogue) to what actually occurred in the fight for Pavlov's House. However, I will not recount those facts here, given that such details would spoil readers' enjoyment of what, in retrospect, turned out to be a good read. The book covers the entirety of the battle of Stalingrad and the bitter fighting for the city from August 1942 to February 1943. As mentioned above, the author discovered new material from Russian and German senior leaders and soldiers and thus can present their stories, their visceral experiences and their testimonies about the vindictiveness of this urban warfare. These new, raw accounts make up the majority of the book's pages.

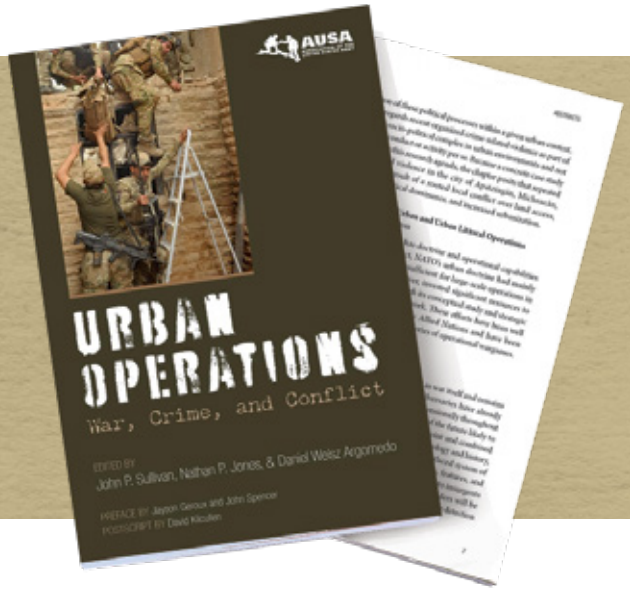
Source: Wikipedia

The defence of "Pavlov's House" became a David versus Goliath fable—some of it recounted by Iain MacGregor in the above excerpt from The Lighthouse of Stalingrad—in which Pavlov and a small group of Soviet soldiers fought with only small arms, anti-armour weapons and sometimes their bare hands, in a large building that stuck out like a sore thumb into the German lines on the west bank of the Volga River.

The author devotes the most space to the leaders and subordinates of the opposing units who faced each other within the city's core during the five-month battle. On the Russian side were Lieutenant-General Vasily Ivanovich Chukov (commanding the 62nd Army), Major-General Alexander Ilyich Rodimtsev (commanding the 13th Guards Rifle Division), Colonel Ivan Pavlovich Elin (commanding the 42nd Guards Rifle Regiment) and the various junior leaders who fought within Pavlov's House. German leaders whose stories are told are General Friedrich Paulus (commanding the 6th Army), Major-General Alexander von Hartmann (commanding the 71st Infantry Division), Lieutenant-Colonel Friedrich Roske (commanding Infantry Regiment 194) and the junior leaders within Roske's unit. In telling their stories, the author moves us from August 1942 to February 1943 by essentially focusing on these soldiers and the events they participated in or witnessed within the city, and only occasionally and briefly discussing events that occurred in Stalingrad's other suburbs or the larger Russian counteroffensive which eventually surrounded and trapped the Germans in the city that winter.

This book is not the last word on the history of the Stalingrad battle, nor does it discuss in meticulous detail the two-month fight for Pavlov's House. The titanic struggle for the "City of Stalin" is overwhelming in depth and breadth (it is important to remember that this was a fight involving several Army Groups with dozens of divisions made up of hundreds of thousands of soldiers both inside and outside the city, in a battle that lasted several months in a sizeable urban environment), and no one author can encompass in a single project all of the particulars, minutiae and factors that contributed to the history of this enormous fight. I would suggest that it will never be possible to create such a work. Also, the battle for Pavlov's House was not recorded in great detail, and the urban legend it has become has now obscured some of its truth. However, it is these new accounts of the fighting, largely within but occasionally outside Stalingrad, together with the fresh, important, albeit briefly presented facts that uncover some of the truth about the battle for Pavlov's House, which make Mr. MacGregor's book valuable, as it will add to the existing body of literature already produced on this remarkably horrific urban battle.

If this review has sparked your interest in reading *The Lighthouse of Stalingrad*, you can be confident that after you have done so, you can place it beside classic and well-known works such as Antony Beevor's *Stalingrad – The Fateful Siege: 1942–1943* and William Craig's *Enemy at the Gates: The Battle for Stalingrad*, with the comfortable knowledge that the sum of this battle will be made up of many parts.



Urban Operations: War, Crime, and Conflict

BIBLIOGRAPHICAL INFORMATION:
SULLIVAN, John P., JONES, Nathan P., and WEISZ ARGOMEDO, Daniel, editors. Boulder, CO: KeyPoint Press, 2024, 421 pages.
ISBN: 979-8990915831

Reviewed by Lieutenant-Colonel (Retired) Steve MacBeth, MSC, MSM(2), CD2.

The 2022 United Nations World Cities Report states that half of the global population lived in cities in 2020, with that number projected to reach 60% by 2070. Urban areas will absorb 3 billion new people in the next generation, many of whom will move to under-governed and resource-strained cities. In recent years, urban warfare has escalated, with destructive battles in places like Mosul (2016–2017) and Ukrainian cities (2022–present) as well as in the Israeli–Hamas conflict (2023–present), highlighting challenges for military forces, risks to civilians, and complex legal and informational dynamics. Cities, now key hubs for markets, political power, criminal networks and social upheaval, will remain critical terrain in future conflicts.

In *Future Shock*, Alvin Toffler warns that as situations change, we must adapt by acquiring new knowledge and discarding what is no longer vital. Some military personnel suggest avoiding urban confrontations due to the risk of costly battles that demand significant resources, time and commitment. Urban operations are often seen as niche and outside conventional manoeuvre warfare, which is hard to train for at scale. *Urban Operations: War, Crime, and Conflict*, edited by John P. Sullivan, Nathan P. Jones and Daniel Weisz Argomedo, offers a comprehensive analysis of urban warfare's challenges and its implications for security, governance and military strategy, emphasizing that urban combat will likely be a central focus of future conflicts.

The work guides the reader through historical urban warfare examples and contemporary considerations, prompting reflection on Toffler's idea of needing to "learn, unlearn, and relearn" to adapt to the evolving nature of urban conflict. The book features essays on the evolution of urban warfare, the interaction between traditional and irregular threats, and the socio-political dynamics shaping urban battlefields. With an interdisciplinary approach, it examines tactical, operational and strategic considerations, while integrating emergent technologies and legal aspects for a fresh perspective. This review will summarize the work and use Toffler's concept as a framework to discuss areas where the book could deepen the understanding of urban warfare. The collection is valuable for military professionals, policy-makers and scholars, offering recent lessons and new insights while reinforcing core concepts.

Book Organization and Summary

The book is organized into historical perspectives, modern dynamics and future considerations, with the central thesis that urban environments will increasingly be focal points of war. It argues that issues like infrastructure, population density and interconnectedness will require innovative security solutions adapted to urban conflict's physical, informational, legal and human terrains. The book offers flexibility, allowing readers to focus on specific interests or read broadly. The preface, introduction and postscript provide valuable context for the case studies and frame the book as a starting point for further exploration of urban warfare. Case studies span from World War II to contemporary conflicts, covering topics such as civil-military interactions, law enforcement, artificial intelligence, surveillance, war gaming, modern sieges and legal challenges. Geroux and Spencer'spreface links the case studies to broader themes, while David Kilcullen's postscript emphasizes the interconnectedness of the issues, encouraging readers to view them as part of a complex system. The book seamlessly integrates historical, contemporary and forward-looking strategies.

Relearning, Learning and Unlearning from Urban Operations: War, Crime and Conflict

Relearning

The book reinforces foundational lessons about urban operations that have emerged over the past 25 years, emphasizing the need to retain these lessons amid

Source: Combat Camera

changing circumstances. First and foremost, there is the understanding that although the character of (urban) warfare is changing due to technological adaptation, those charged with civil and military decision-making powers need to understand that executing urban battles successfully will require extraordinary resources. Should the decision be taken to become engaged, modern operations are more likely to resemble "siege" operations of an earlier generation than rapid operations predicated on precision munitions and perfect situational awareness provided by emergent intelligence, surveillance and reconnaissance capabilities. The authors make great effort to ensure that readers relearn not only the lesson of resources, time and risk, but also the requirement for practitioners, policy-makers and scholars to understand that urban operations—perhaps more than any others—due to the concentrations of the population, require tight civil-military coordination and an ability to shift seamlessly or act concurrently to conduct high-intensity combat while establishing the rule of law and interacting with civilian populations.

One of the book's key strengths is its interdisciplinary approach, combining insights from military history, criminology, sociology and urban studies, offering a nuanced perspective on urban operations. The third chapter, by Russell W. Glenn, best illustrates this, using the Battle of Manila to highlight the civilian cost of war and reminding readers that the population is an operational consideration, not just a humanitarian issue. Throughout the book, General Charles Krulak's "Three Block War" concept—that a tactical unit may find itself engaged in combat, stability and humanitarian aid tasks within a three-city-block radius—is stood out. Given the lessons presented in the book, that concept had great relevance in the early 21st century but may need to be relearned.

The book provides a platform to refresh established concepts and offers a deep perspective on new trends for readers to consider when examining urban operations.

Learning

The book's greatest strength lies in its ability to introduce and aggregate new material, considerations and perspectives on the urban battlefield for a professional audience. It provides insights into innovative tactics like swarming; emergent technological systems such as wide-angle motion imagery that will change how formations, units and individuals may be detected within urban terrain; how artificial intelligence will enhance decision-making support and increase the speed of battle; and how the reader may most effectively utilize war games to help conceptualize urban battles effectively while addressing the challenges of littoral and subterranean environments.

Unlearning

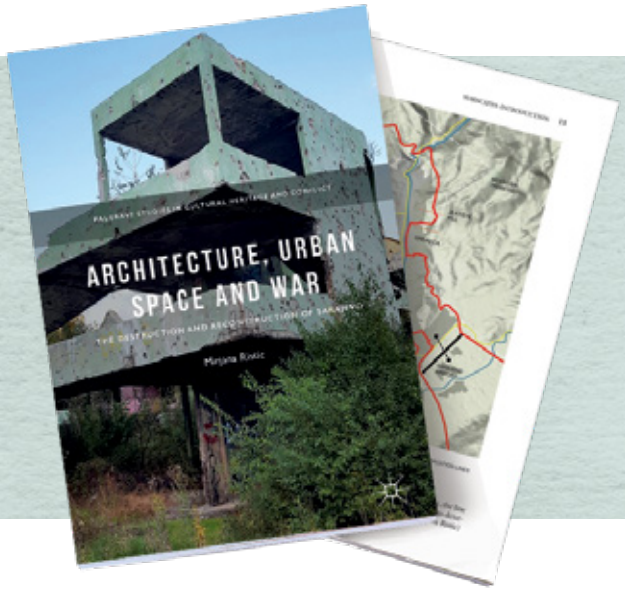
The lessons learned and relearned in the book are instructional, but equally important is what should be "unlearned." Readers are urged to consider two key tenets: each urban problem is unique, making templated solutions ineffective, and reconstruction must be viewed as the immediate follow-up to urban operations. Recent operations have separated reconstruction from tactical planning, but Glenn emphasizes that it should be considered before urban battles. He compares post–World War II German efforts to modern-day Ukraine, highlighting the scale of commitment required—a lesson often overlooked in the professional community. This historical perspective, combined with lessons from Iraq and Afghanistan, underscores the dangers of corruption and the disconnect between military objectives and stability planning.

Another key theme is the warning against templating urban operations. Given the differences in infrastructure, population and culture in each city, historic templates can serve only as a starting point, requiring updates for each new environment. The book stresses that both the short-term recovery view and the desire to template warfare must be "unlearned" for success in future urban conflicts.

Although the book excels in many areas, it has some limitations. It identifies problems, innovations and changes well but lacks clarity in its recommendations. For instance, the call for greater interagency cooperation is valid, but the book offers little guidance on how to implement it effectively. More actionable solutions would have improved the practical utility for practitioners and policy-makers. Overall, the book is accessible to a broad audience, though some sections, especially those on legal policy and urban theory, may be too complex for readers without specialized knowledge. However, those issues are minor, and readers who wish to do so can delve deeper into specific concepts or theories.

Urban Operations: War, Crime, and Conflict is a timely and thought-provoking contribution to modern warfare literature. Its interdisciplinary analysis and compelling case studies make it a valuable resource for those interested in urban security and conflict. It is highly relevant for Canadian Armed Forces personnel, particularly Canadian Army leaders, as urban operations are increasingly central to modern military strategy. The book's insights into the interplay between military and non-military actors are invaluable for understanding these complex environments. It also holds value for policy-makers and civilian audiences, highlighting that urban operations require a whole-of-government approach, as military solutions alone are insufficient: development, diplomacy and governance must be integral to urban combat efforts.

Source: Combat Camera



Architecture, Urban Space and War: The Destruction and Reconstruction of Sarajevo

BIBLIOGRAPHICAL INFORMATION:
RISTIC, Mirjana. Palgrave Macmillan Cham, 2018, 260 pages.
ISBN: 978-3-319-76770-3

Reviewed by Noorulain Naseem and Muneeba Nawaz Khan, Pakistan-based research analysts.

In *Architecture, Urban Space and War*, Dr. Mirjana Ristic examines the intricate interplay of architecture, cultural heritage, urban design and sociopolitical conflict. Focused on the civil war in the Former Yugoslavia (1992–1995) in the Republic of Bosnia–Herzegovina, the book utilizes Sarajevo as a case study to analyze the relationship between those factors. Ristic's work is part of an emerging literature in war studies that aims to highlight the alarming increase in civilian casualties in modern conflicts.

The book explores how cities serve as stages for societal change and resistance against violence and oppression through the adaptation, appropriation and transformation of architectural elements and public spaces. Ristic makes a valuable contribution to the literature on the Bosnian–Serbian–Croatian war that resulted in the disintegration of the Former Yugoslavia. The carnage unleashed during the war took a heavy toll on civilian lives and led to gruesome crimes, including the genocide in Srebrenica. The International Criminal Tribunal for the former Yugoslavia found that hundreds were killed and thousands injured between September 1992 and August 1994.

Ristic explains how the destruction of urban spaces in the city of Sarajevo by the Bosnian Serb Army (BSA) was a military strategy resulting in the social segregation of ethnic groups. She argues that architecture and urban design were instrumentalized during the conflict in Sarajevo to sow violence, fear and division. The city's geography and urban morphology were used to spread violence and transform the city into a "landscape of fear." Sniping, shelling and terrorism were employed to target people and buildings to create terror and as a means of pressuring the Bosnian–Herzegovinian political leadership to accept the BSA's ethnic division of Sarajevo. Although not qualified as genocide, the siege of Sarajevo involved the systematic killing of unarmed civilians and the destruction of the city's architecture as a war strategy. That approach aimed to undermine the collective resilience of the people of Sarajevo and suggests an overarching strategy by the Serbian military to isolate, segregate and target Bosnians without distinguishing between combatants and non-combatants.

The author has built on the work of Deleuze and Guattari (1987), using the concept of assemblage, which explores the relationship between social change and social networks. She relies heavily on the mapping of urban architecture destroyed during the conflict. This helps gauge the impact of war on civilian infrastructure and the subsequent effects of community resilience and experiences in Sarajevo. The book delves into the term "warchitecture," examining how and why the Serbian Army targeted civilian urban facilities to terrorize, demoralize and traumatize the civilian population. According to the author, the aim was to victimize collective identity and political ideologies embedded in the infrastructure of religious, communal and national importance. Since urban and community spaces posed no direct military threat, targeting them was an attempt to instill fear and to isolate and marginalize the civilian population. The blurred lines of combat in Sarajevo ensnared non-combatants, making them one of the primary targets of the Serbian military. Ristic employs the term "urbicide" to convey the idea that the targeting of urban infrastructure was intended to extinguish the essence of urban life and the collective spirit of the population.

Specific buildings, including City Hall and the Oslobodjenje newspaper, were targeted due to their multi-ethnic significance, with their damage or destruction exacerbating the fragmentation of the city along ethnic lines. The targeting of Bosniak (Bosnian Muslim)–Islamic heritage buildings, including mosques, underscores that Muslims were the primary focus. The mosques served as "meeting places for a community's secular activities" and were also places where residents could obtain humanitarian aid.

Source: Wikipedia

Since urban and community spaces posed no direct military threat, targeting them was an attempt to instill fear and to isolate and marginalize the civilian population. The blurred lines of combat in Sarajevo ensnared non-combatants, making them one of the primary targets of the Serbian military.

The attacks were seen as an attempt to erase the communities' identity and create a situation where people have no memory of their past. Such violence has been understood as a "cultural dimension of genocide," or ethnic cleansing by other means. By burning cultural documents, razing mosques and Catholic churches, and bulldozing the graveyards, the nationalist forces aimed to safeguard against potential future claims by those they displaced and dispossessed.

The book also investigates the improvised and adaptive responses of civilians to modern warfare. One significant aspect explored is the "adaptive resilience" of Sarajevo's population during the siege. In the face of relentless violence and terror, residents became self-taught architects, modifying their living spaces for protection. Civilian resistance to wartime terror and violence involved various spatial patterns and practices, including the adaptation of underground, semi-underground and above-ground spaces. That led to the creation of new spaces and patterns of urban life, such as exhibitions, theatres, movies and concerts. Residents safeguarded themselves during travel by walking quickly and by running at crossroads. Sporting attire was commonly worn, and bicycles served as a means of transporting goods. Cars were often camouflaged in military colours, displayed bullet holes, and lacked windows. Public transport was rarely in operation.

Additionally, the book focuses on the aftermath of the conflict, examining the reconstruction efforts and the controversies surrounding them. For example, the reconstruction of Oslobodjenje proved challenging in the post-war period due to the building's double erasure—representing the loss of both past significance and the pre-war ideals of brotherhood and unity. The reconstruction of mosques provoked debate and opposition among religious and secular Bosniaks and residents of other ethnicities. The war impacted the language as well. Before the war, the official language in Bosnia–Herzegovina was Serbo-Croatian. However, after the war, each group renamed it to correspond to their ethnic title: Bosnian (linked to Bosniaks), Serbian (used by Serbs), and Croatian (used by Croats). Roman script became the official script for Bosnian and Croatian, while Cyrillic was used for Serbian. The wartime strategies aimed at targeting cultural, social and societal monuments of architecture led to the entrenchment of conflict and ethnic violence at the group level, forever altering the socio-cultural integration potential of Sarajevo.

Overall, *Architecture, Urban Space and War* provides a multi-disciplinary approach to understanding the spatial dimensions of political conflict. Sarajevo is a crucial case study for analyzing the difference between civic nationalism and ethno-nationalism. The book combines theoretical frameworks, urban mapping, and empirical analysis to shed light on the complex interplay between architecture, urban space, and the dynamics of war. It provides valuable insights for scholars, urban planners, architects and anyone interested in the profound impact of conflict on cities and societies. It underscores the enduring significance of architectural and urban spaces in shaping collective memory, identity and resilience in the face of adversity.