

A soldier in camouflage gear, seen from behind, walks through a city of rubble. The buildings are heavily damaged, with exposed concrete and debris scattered everywhere. The sky is clear and blue.

FUTURE URBAN CONFLICT, TECHNOLOGY, AND THE PROTECTION OF CIVILIANS:

Real-World Challenges for
NATO and Coalition Missions

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June 2021

Strengthening NATO's
Ability to Protect

The Stimson Center

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COVER SINJAR, IRAQ - FEBRUARY 26:
Muhsin Miro, a 20-year Peshmerga
army veteran, patrolling the now
ruined city of Sinjar in Kurdistan.

Giles Clarke/Getty Images

Report designed by Verdesca Creative

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ABOUT THE PROJECT

Strengthening NATO's Ability to Protect is a research initiative of the Transforming Conflict and Governance Program at the Stimson Center. This project seeks to build bridges between NATO stakeholders and the expert community to act on the Alliance's ambition to protect civilians in its operations around the world.

In 2016, the NATO Policy on the Protection of Civilians (PoC) made protection a goal of future operations, kicking off the development of an action plan and a military concept on PoC. Whether in active security operations, train and assist missions, or support to disaster relief, NATO policy is to mitigate harm from its actions and, when applicable, protect civilians from the harm of others. To help NATO succeed, Stimson launched this project, in partnership with PAX and supported by the Dutch Ministry of Foreign Affairs, to cultivate and offer external expertise to NATO as well as assess the current levels of doctrine and guidance on PoC within NATO nations and partners. Emphasis is on solutions-focused research and building bridges across governments, academia, international organizations, and NGOs.

In support of this project, Stimson is commissioning a series of papers authored by leading experts in their fields that considers protecting civilians and NATO's future missions, capabilities, and approaches. The papers, published throughout 2021 and 2022, aim to engage NATO stakeholders as they consider NATO's role in future conflict, support further implementation of the NATO Policy on the Protection of Civilians, and focus on NATO's 2030 agenda and beyond.

We would like to thank our partners at PAX and the Dutch Ministry of Foreign Affairs for their insights and generous support of this work.

Stimson is a research and policy institute in Washington, D.C. that has worked on advancing the protection of civilians in conflict zones for more than 20 years. Today, as new challenges emerge, Stimson continues to be at the forefront by engaging new voices, generating innovative ideas and analysis, and building solutions that promote international security, prosperity, and justice.

ABOUT THE TEAM



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He served in Iraq in 2006-7 designing urban counterinsurgency and counterterrorism operations for Multi-National Force Iraq, and also served in Afghanistan, Somalia, Libya and Colombia.

He is the author of a major prize-winning book on the future of urban operations (*Out of the Mountains*, Oxford University Press, 2013), and has authored three other books, as well as 11 research papers on the future of urbanization, conflict and crime. He has led several major urban concept design projects for the U.S. and allied governments and worked with city-level governments in the United States, Australia, Latin America and Europe on issues of urban public safety and counterterrorism. His team worked for the Defense Advanced Research Projects Agency (DARPA) to design a big-data COP/CAP system for operators in Afghanistan, and for the Counterterrorism Technology Support Office (CTTSO) to produce an urban analysis and assessment handbook, and did fieldwork with police, military and civil government in cities under stress in Africa (Mogadishu, Monrovia Benin, Lagos, Tripoli, Nairobi) and Latin America (Medellin, San Buenaventura, Bogota, Cali, San Pedro Sula) as well as working with U.S. cities (New York, NY and Ventura, CA) and agencies (FBI, local and state law enforcement, customs and border protection) in Australia and the United States. He is a lead researcher for NATO's ongoing Urbanization Program.



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Cordillera Applications Group is a research and operations firm dedicated to supporting clients through capacity building, training, monitoring, advisory support, and specialized field teams. Cordillera maintains offices in Latin America, North America and Europe, and covers Africa, the Asia-Pacific and the Middle East.

INTRODUCTION

This paper was prepared by Cordillera Applications Group (Cordillera) to support the Stimson Center's efforts to understand the impact of increased urban conflict on the protection of civilians.¹ The paper explores urban protection of civilians by examining, in turn, the nature and importance of the future urban and littoral environment, the impact of future threats and technologies on that environment, and the implications for actors concerned with supporting the protection of civilians. The paper then draws findings into a set of recommendations for those working to protect civilians in future urban conflicts.

The traditional military approach assumes that urban areas should be avoided, bypassed, and entered only as a last resort, while recognizing that many of the major battles in history occurred in cities.² More recent and realistic studies identify the urban environment as one that cannot be avoided, especially if the concept of military operations is expanded to include a multi-domain "conflict continuum" from cooperation through competition to crisis and conflict. The implications of an increasingly urbanized world for military operations, and consequently for the protection of civilians, are significant. Traditionally, the challenge for military forces is how to defeat threats embedded and diffused within the population, without causing catastrophic damage to civil society, destruction of critical urban infrastructure, and civilian casualties.³ Emerging and disruptive technologies, however, will exacerbate the threat to civilians and complicate the challenge for military forces to conduct operations. This challenge is particularly relevant in a NATO Article V type scenario involving peer-on-peer⁴ forces, including potentially massive destruction of infrastructure and subsequent risk to the civilian population.

Context

More than half the world's population already lives in cities. The United Nations estimates that urban populations worldwide will grow from 4.2 billion (55% of the world population) in 2018 to 6.7 billion (68% of the world population) by 2050.⁵ Cities are centers of strategic and political power, with significant influence beyond their geographical footprint. Cities are prime targets for military and terrorist attacks and are increasingly the setting for intra-state violence and armed conflict, as seen in recent conflicts in Iraq, Syria, Ukraine, Libya, Yemen and Georgia. The urban environment has been the principal setting for modern warfare (excluding Afghanistan until mid-2015, but increasingly also there) and the chosen battleground for insurgents and anti-government forces. Numerous analysts have noted the increasing trend toward urbanization of conflict, as one feature of a more urban planet and a more urbanized global population.⁶ Urban operations are not solely offensive; rather, militaries operate in cities across the full conflict continuum. Consequently, it is not a matter of 'if', but 'when' military forces will be involved in urban operations ranging from humanitarian assistance and disaster relief (HADR) to protracted combat.

Protection of Civilians in Urban Warfare

Various NATO policies address parts of this problem. To start, the "NATO Policy for the Protection of Civilians," for example, was adopted at the NATO Warsaw Summit in 2016.⁷ With this Policy, NATO laid out an ambitious definition of the protection of civilians that relates directly to future conflicts, including in urban settings, and an active role for NATO in protecting civilians. The Policy (Paragraph 9) states:

Protection of Civilians (persons, objects and services) includes all efforts taken to avoid, minimize and mitigate the negative effects that might arise from NATO and NATO-led military operations on the civilian population and, when applicable, to protect civilians from conflict-related physical violence or threats of physical violence by other actors, including through the establishment of a safe and secure environment.⁸

This Policy reflects the fundamental understanding that the protection of civilians is an obligation of all parties to conflict. The foundation of this protection is international humanitarian law (IHL). Yet even under the law, some harm to civilians is permissible. Armed actors must distinguish between civilians and combatants, and between civilian and military objects; must ensure that their attacks are proportional; and that they are a military necessity. The Policy goes further, thus, in stating that NATO will work to protect civilians from the harm of its own operations as a matter of policy (adding to its legal obligations), as well as to protect civilians from the harm of others – a goal to prevent perpetrator tactics used in modern warfare to go against civilians. Even if this Policy was not in place, NATO would face such issues in future urban settings and need to plan for such settings. In urban environments, civilians are almost always present and may be at-risk or vulnerable; assessing those threats and vulnerabilities will assist military planners. Likewise, urban populations depend on systems such as water, sanitation, electricity, food production and distribution, and access to transportation and communications. This imposes the obligation (whether in a formal legal sense, or – equally important – as a prerequisite for mission success) to protect critical systems, while also creating a temptation for combatants to target civilians or critical systems in order to weaponize a city against an adversary. Thus, in an urbanized battlespace, the traditional understanding of the protection of civilians requires updating and expanding.

This paper explores urban protection of civilians by examining, in turn, the nature and importance of the future urban and littoral environment, the impact of future threats and technologies on that environment, and the implications for the protection of civilians. The paper then draws findings into a set of recommendations for those working to protect civilians in future urban conflicts.

THE NATURE AND IMPORTANCE OF THE FUTURE URBAN ENVIRONMENT

In 2013, the NATO Nations in their “Framework for Future Alliance Operations” recognized the urban environment as a area of operations where future events, crises or conflicts may occur.⁹ The UK Future Operating Environment 2035 notes that “the urban environment will be one of the most challenging areas to operate in.”¹⁰ This urban environment involves multiple factors. In fact, based on the political complexity of the urban environment, the presence of civilians – including some who may choose or be forced to take direct part in hostilities – can have strategic impact on the conduct of operations. Indeed, given the constraints that cities impose on the use of military force, their complex terrain, and the difficulty of understanding and fighting in urban spaces, cities are arguably the most challenging operating environment. While combat occurs at the tactical level, urban operations have strategic risks and implications. The NATO definition of an urban environment is expressed through a physical system with an underlying functional infrastructure and a human system comprising a population of significant size and varied composition, interconnected through a complex, dynamic, and open system-of-systems.¹¹ Consequently, urban operations impose not only a high physical demand but an ever-increasing cognitive load, where understanding a dynamic, adaptive, and highly connected urban system is critical to protecting civilians and critical infrastructure.

Historically, military forces avoided urban battlespace, seeking freedom of maneuver to shape the terms of battle relative to adversaries. The aim of military operations is to bring military effect to bear where it could best support strategic goals. But since cities are strategic assets, forces have frequently been unable to avoid being drawn into urban and littoral regions where the majority of the world’s population lives and where political and economic activity is concentrated. This battlespace is densely populated, often with dissatisfied and marginalized people, many of whom may be armed for self-defense or reasons unrelated to the conflict. Adversaries employ a wide range of war-fighting techniques, simultaneously, across all physical domains and the information domain. The protection of civilians has proven extremely challenging in this environment, and significant work is still required to ensure military understanding of the requirement.

Urban Settlements

By 2035, the majority of the world’s population is expected to live in cities, many of which are located on or near coastlines.¹² The greatest increases in urbanization are likely to be in Asia and Sub-Saharan Africa. Developed cities will have modern, well-functioning infrastructure and institutions and ready access to resources. However, due to rapid unplanned urbanization, peri-urban areas in the Global South will continue to comprise informal settlements (slums or shanty towns). Failed, failing, or ‘feral’ cities could trigger security issues.¹³ Such cities tend to be in areas prone to natural disasters; they lack resilience due to poor infrastructure, scarce resources, and ineffective or absent institutions and services. Poor governance and weak institutions allow violent non-state actors to flourish. Patronage systems and parallel governance structures will, in some areas, fill the role of absent governments. Government responses to these challenges may draw military forces into stabilization or HADR operations.

The Urban Quad

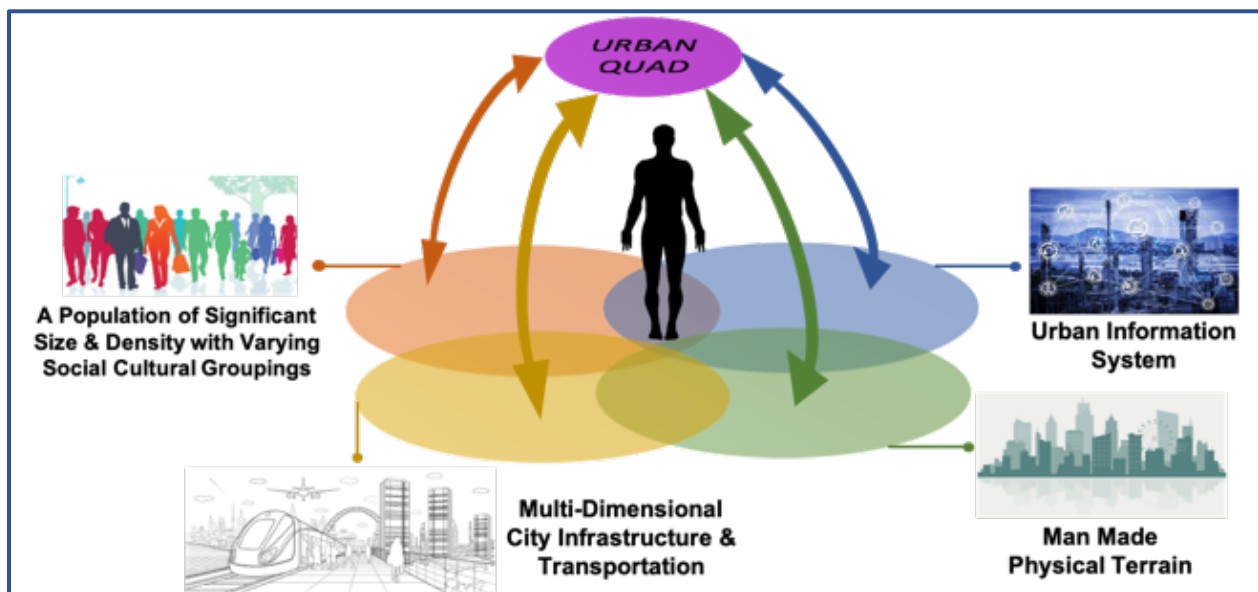
The urban system can be conceptualized using NATO’s ‘urban quad’ model (Figure 1).¹⁴ The quad comprises a complex man-made physical terrain; a population of significant size and density with varying sociocultural groupings; multi-dimensional city infrastructure and transportation; and an urban information system. The quad, with its associated dynamics and flows, incorporates the core elements that must be understood to enable urban protection of civilians. This conceptual approach to the urban environment, outlined in the “NATO Urban

Capstone Concept,” is critical for military planners to understand the setting for urban protection of civilians.¹⁵ Its implementation through wargaming will support the development of military courses of action that take into consideration the requirements of the “Concept for the Protection of Civilians.”¹⁶

Physical System

The physical system consists of the complex multi-dimensional terrain of an urban settlement and the natural environment within and around it. This includes subterranean, surface, super-surface (rooftop), and hollow-space environments. Urban in-fill and sprawling informal settlements on the outskirts of cities create edgeless conurbations without distinct rural or transitional zones. Some informal settlements cover wide areas with one-story shanties but also include high-rise buildings. Dense built-up terrain superimposed on a natural landscape makes the total size of an urban area many times that of a similar piece of natural terrain, increasing the complexity of operating within it.

Figure 1: The Urban ‘Quad’ represents the interaction among physical, human, and information landscapes and decision making for action to generate influence and effects.



Urban Littoral

The physical system of a coastal city also includes its littoral zone, comprising shallow waters, chokepoints, straits, jagged and rugged coastlines, and archipelagic environments with islands and tidal areas presenting constricted sea approaches. A coastal city may be partitioned by inlets, rivers, and canals which bring risks of flooding, water- or insect-borne disease, and erosion. The urban littoral zone hosts, and will continue to host in the future, the major ports and trade hubs through which the global population is sustained. It represents a complex, cluttered, crowded environment that brings together large amounts of coastal shipping traffic at sea, through key transportation hubs ashore supporting both the global energy and supply chain, in addition to the movement of people.

The massive increase in electronic connectivity since the beginning of this century has created a *networked* urban littoral, an increasingly connected operating environment that complicates military access.¹⁷ Historical and recent conflicts have demonstrated the importance of the urban littoral for civilian well-being – not just in

cities themselves, but in hinterland regions. Thus – as during the blockade of the port city of Hudaydah, which triggered a humanitarian crisis across wide areas of Yemen – protection of infrastructure and populations in coastal cities may be critical for civilians both in urban environments as well as those populations much further afield.¹⁸

Urban Infrastructure

Within this human-built terrain reside transport, communication, education, cultural, health, public safety and utility infrastructure nodes and linkages that enable critical flows of water, fuel, electricity, money, people, and goods to sustain the city’s function. Supporting space-based components (such as navigational and communication satellite systems) are also part of this infrastructure. Damage or destruction of these interlinked components can have significant detrimental effects on the civilian population. In this interdependent urban system, distant nodes may have significant influence across an entire city. Moreover, critical infrastructure may be located outside the city, in rural or peripheral zones.

“In an urbanized battlespace, the traditional understanding of the protection of civilians requires updating and expanding.”

Human Dimensions & Factors

During conflict, civilians may play a role in the conduct of the war. The urban environment houses a population that may be neutral, aligned with friendly forces, or may support adversaries or criminal elements – either willingly, or as a means of survival. Others may be coerced or held against their will as human shields or may be targeted by opposing forces regardless of their behavior. These alignments are affected by the security environment as perceived by the population. The population’s perception of security thus links tactical action to strategic and political effects. Population movements, especially flows of internally displaced persons (IDPs), also introduce friction. As a social system, a city can be understood as a process of ongoing negotiations among residents, who each pursue their own goals with various means. While some of these negotiations result in isolated, short-lived outcomes, other negotiations – particularly those among groups and influential stakeholders – contribute to the continual self-reorganization of the system, thereby shaping the physical city. Abrupt disturbances to urban routines can trigger second- and third-order effects as residents renegotiate ways to meet their needs. For this reason, urban environments should be approached as coupled social-biophysical-cyber systems.

Connectivity and Smart Cities

Information infrastructure enables the rapid exchange of ideas, data, goods and services. Included in the information system are cyber networks and computer systems that enable and control the exchange of data. Like the other systems, the information system takes the form of flows that depend on physical infrastructure and are influenced by human interaction within (and external to) the urban environment. Many urban areas are becoming “smart cities” wherein information and communications technology help increase efficiency, share information with the public, and improve government services and citizen welfare. The information system is an integral part of a city and needs to be understood as such, since destruction or degradation of the information system is akin to damaging neural networks and will affect the functioning of the whole system. Consequently, urban information systems should be identified and protected as part of an overall protection of civilians approach.

FUTURE THREATS & TECHNOLOGY TRENDS

Future Threats

Future threats and technologies will also significantly impact the urban environment and how forces will operate there, both with implications for the protection of civilians. Urban density and complexity will increase, creating challenges to access, maneuver and understanding. Many life-sustaining functions of urban areas are becoming data-dependent, while connected urban systems also generate essential data. As such, the physical well-being of civilians in a contested urban environment will be heavily affected by combatants' information operations.

“Adversaries may target a city itself, along with its infrastructure and systems, for destruction or disruption.”

Significant work has been done by NATO in identifying threats posed by emerging technologies in the urban environment.¹⁹ Cities are attractive to adversaries, whether state or non-state actors, because of their symbolic and economic value as strategic hubs. Additionally, cities allow adversaries to hide amongst the population and weaponize networks, institutions, and resources for military purposes. Adversaries may target a city itself, along with its infrastructure and systems, for destruction or disruption. Increasing connectivity will enable adversaries to disrupt or control larger urban areas with smaller forces, or to control them by interdiction from outside without needing to occupy or directly attack them. Technological advances in consumer electronics and advanced manufacturing will accelerate the proliferation of capabilities for intelligence, surveillance, and reconnaissance (ISR) and for lethal improvised weapons. This will affect operations across land, sea, air, space, and cyberspace, as traditionally land-based adversaries acquire new capabilities.

In a future smart city involving these threats, there are numerous key considerations for the protection of civilians in future operations. They include:

- Weaponization of city technology to target populations (or critical systems).
- Impact on civilian well-being from disruption to smart infrastructure and navigational systems such as GPS.
- Targeting of smart infrastructure systems such as electrical, water, sanitation, and energy systems that are vulnerable to cyber or kinetic attack.
- Risks arising from unprecedented information collection and access opportunities, allowing armed actors to identify, target, or influence civilian populations through manipulation of information.
- Dispersal of critical infrastructure (some of which may not even be located within the same state or even the same country as the city of interest) so that the protection of civilians within a given city can be affected by distant operations.

PROTECTING CIVILIANS IN THE FUTURE URBAN ENVIRONMENT: DRAWING ON PAST CASES

Building on the foregoing analysis, this section draws together lessons from two recent and distinctive examples of urban conflict in Iraq (the battle of Mosul) and in the Philippines (the battle of Marawi). This section then incorporates key observations from those lessons to identify a menu of considerations for NATO and others planning to address the protection of civilians in future urban environments. In addition, the considerations and comparisons from the Battles of Marawi and Mosul were drawn on to support the development of the TNO MARVEL model used during the NATO Urban Concept development wargames.²⁰ The MARVEL model provides evaluation of the second and third order effects on the civilian population and infrastructure caused by military operations in an urban environment.

Case 1: Mosul 2014-17

The liberation of Mosul in July 2017 by Iraqi and coalition forces from Da'esh (Islamic State, or ISIS) ended nine months of intense urban combat against a hybrid adversary who had almost three years to prepare for the battle.²¹ It was a decisive battle for the campaign against Islamic State in Iraq, and was won through a coalition with assets such as a force of numbers, willpower, and a combined industrial base that dramatically exceeded that of the Islamic State. The battle involved fast-paced operations – unpredictable in length, costly in resources, and devastating to the infrastructure, population, and character of the city. More than 10,000 civilians died during the battle, including at least 2,300 killed by coalition airstrikes and indirect (artillery and rocket) fire.²² More than 800,000 civilians (or 44% of Mosul's population of 1.8 million) were displaced across northern Iraq, while “in western Mosul alone, 40,000 homes were destroyed.”²³ Islamic State fighters tunneled between houses, further damaging the city's infrastructure, while employing civilians as human shields.²⁴ The battle also highlighted the difficulty of balancing the tactical focus demanded by high-intensity urban combat with broader strategic objectives, including protection of civilians. Key lessons include:

- The importance of controlling critical infrastructure outside core urban terrain (including water supply, sanitation, electrical power generation and distribution) in shaping combat within the city itself. Combat around the Mosul Dam, and efforts to control electrical power generation and water supply systems for the city (all of which sat outside the city's urbanized terrain, in the countryside to the north, east and west of Mosul) ultimately enabled the coalition to make Mosul untenable for the enemy – but imposed significant hardships on the civilian population.
- The importance of the delivery of non-lethal effects in dense human terrain and interconnected networking. The battle commenced with an encirclement (“investment”) of the city, followed by advances from different directions toward the urban center. Information warfare, using broadcast means, leaflets, cellphones and internet, was used to establish communications with civilians and anti-ISIS resistance groups within the city. Attempts to encourage civilians to leave ahead of the coalition assault through broadcasts and leaflet drops were only partially successful, as the ISIS garrison was holding many civilians as hostages, and because if “a civilian in Mosul [were] to pick up a leaflet in the street, it could be answered with a bullet from an ISIS sniper.”²⁵

- The necessity of providing reception facilities, accommodation, medical services, trauma and psychological support services, and life-saving medical and humanitarian supplies for displaced civilians despite ISIS targeting them as they fled. Efforts to provide these services were coordinated in advance among coalition, Iraqi government and aid agency representatives.²⁶ Reception camps had to be located far enough forward in the battle area to allow civilians to reach them, yet far enough from the fighting to ensure the safety of civilians once there. In the maneuver phase of the battle, this required careful planning and balancing of risks to offer the most effective protection to civilians looking to flee the urban battlespace.
- Prevention and mitigation of the use of civilians as human shields. The coalition and coalition-allied Iraqi forces attempted to apply precision fire against identified enemy locations only, while sparing civilians. The enemy's use of human shields within a cluttered surface and subterranean environment (including tunnels among houses, noted earlier) made this extraordinarily difficult.
- The need for care when targeting industrial areas, where the “consequences [of a strike could] range from secondary explosions, toxic chemical discharging, loss of revenue, and resource capacity. Any singular event can have an unplanned impact on coalition and partner operations, the civilian populace, and potentially regional economic stability.”²⁷
- Management of non-combatant evacuation, screening, reception and humanitarian assistance. The ability of ISIS fighters to hide within the population, infiltrate coalition rear areas and attack friendly forces or headquarters from the flanks emphasized the need for thorough but rapid screening of civilians moving through front lines.
- The need for specifically targeted messaging for civilians emphasized urban connectivity in an environment where “information operations planners need to appreciate that sentiment is no longer village-by-village. It could differ greatly among communities, floors of a building, or elicit sympathetic responses from IP addresses across the world.”²⁸

Case 2: Battle of Marawi 2017

The seizure of the city of Marawi in May 2017 by militants linked to Islamic State (IS) and the subsequent response by Philippine authorities provides useful insights for the protection of civilians during an urban seizure.²⁹ The recapture of Marawi in October 2017 took at least twice as long as comparable urban battles, in part because of capability shortfalls (especially in urban training) of Philippine Armed Forces but also because of a desire of the Philippines Government to minimize casualties among a civilian population whose support for the government was far from assured. Like Mosul, Marawi showed that increasing urbanization and proliferating information technologies widen the battlefield to include narrative space. Marawi has been viewed as a success for information maneuver, integration of land and urban littoral activities, and the coordination with international organizations (IOs) and non-government organizations (NGOs) for the removal of civilians from the operational environment.

As in Mosul, the battle of Marawi devastated physical terrain and infrastructure, while massively impacting the civilian population. The conflict displaced an estimated 98% of the total population of Marawi City (201,785 individuals).³⁰ These individuals “sought shelter in different evacuation centers or with their relatives outside of Marawi City” while the battle “affected economic and commercial activities in the rest of Lanao del Sur province, triggering further displacement.”³¹ While far fewer civilians died in Marawi than in Mosul, the massive scale of population displacement across an under-developed region was hugely disruptive. Given the lack of trust in government, most IDPs sought refuge with family or in reception centers established by displaced persons themselves, making it difficult for aid agencies to assess the scale of the problem or respond to it.³² Key considerations for future protection of civilians include:

- The need for governments to work closely with local communities and international organizations to manage IDP flows. In Marawi, “local governments of host communities such as Iligan City immediately opened evacuation centers in several locations to cater to the humanitarian needs of the displaced population.” The Philippines government established a Regional Command and Coordination Center (RCCC) to manage protection of civilians and HADR, later transforming it into a National Emergency Operations Center (NEOC).³³ UNHCR, other aid agencies and partner governments were able to use this organizational structure to coordinate the protection of civilians assistance efforts.
- By contrast to Mosul (44% displaced) the 98% displacement rate in Marawi was extremely high due to a deliberate government strategy of convincing the population to leave the city. This approach became “a crucial factor in the outcome of the kinetic battle [in the sense] that the population chose to leave, and thus heavy civilian casualties were avoided, and the militants’ hopes of a ‘Fallujah effect’ [generating widespread anger against government brutality] were confounded.”³⁴
- Protecting civilians once displaced. Islamic State fighters inflicted at least 87 civilian deaths and numerous others were injured or taken hostage in the fighting.³⁵ Up to 40 IDPs subsequently died of disease, thirst or malnutrition after being displaced. In addition, an unknown (and still disputed) number of civilians were killed by government action, in an environment where claims and counter-claims of civilian casualties proved a key part of the narrative battle between the two sides.

- The protection of civilian’s impacts were exacerbated by urban devastation, which hampered reconstruction and civilian well-being years after the battle. One crisis-mapping assessment found that the battle damaged, “over 95% of the structures in the main battle area of about 4 square kilometers. Of those affected, 3,125 structures were completely destroyed or uninhabitable, 913 buildings [were] heavily damaged, while 1,232 structures were partially damaged.”³⁶ Marawi thus illustrates that even when casualties are low and a population is evacuated, damage to infrastructure can still severely impact both the city’s people and those of surrounding areas.

As noted earlier, multiple recent instances of urban conflict offer lessons for the protection of civilians. While space precludes further examples in this paper, the next section integrates these lessons into a menu of considerations for Urban Protection of Civilians.

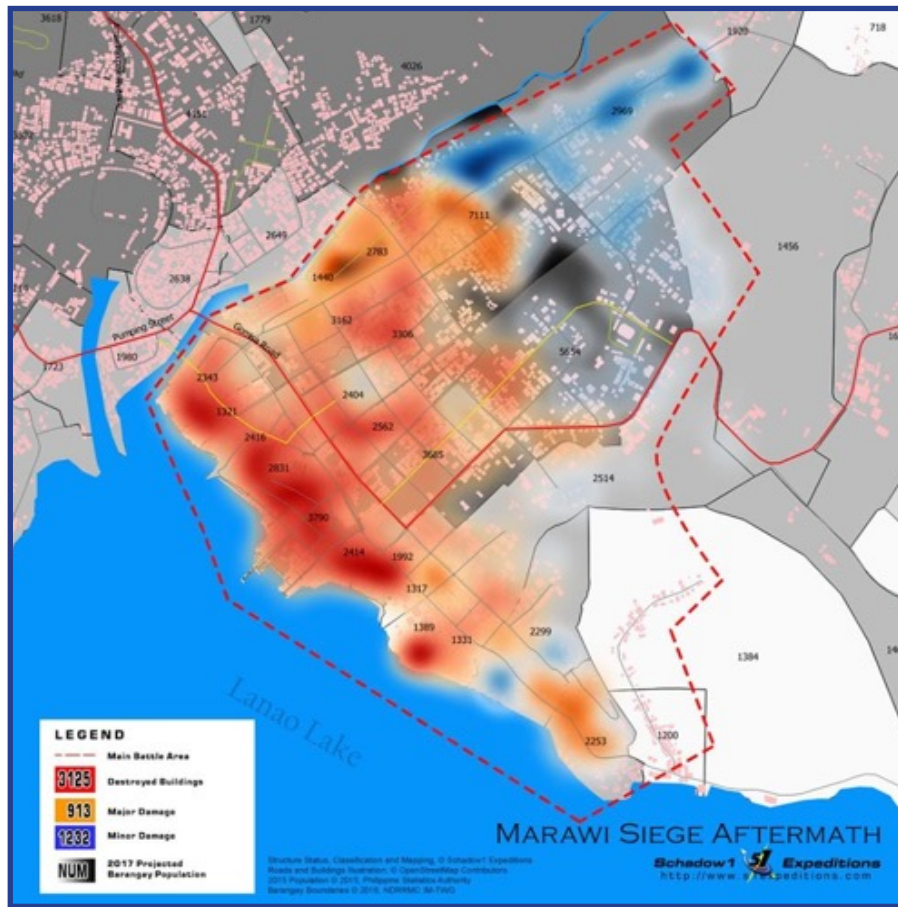


Figure 2: Destruction resulting from the battle of Marawi as of November 2017³⁷

Key Protection of Civilian Considerations for Military Planners

HIGH-INTENSITY PEER-ON-PEER CONFLICT

Safeguard and continuity of Government.
Adequate military forces.
Civil preparedness.
The ability for civil – military forces to be responsive and agile.
Protection from attack and readiness.
Indiscriminate targeting.
Civil – military planning.
Vulnerability assessment.
Planning for logistics and sustainability
Identifying shortfalls and building capability.
Defense against CBRN
Supply chain security
Ensuring technological advantage.

ASYMMETRIC AND HYBRID CONFLICT

Protection of borders from asymmetric “liminal warfare” by hybrid adversaries.
Protection of population from riots and disorder.
Protection of critical infrastructure.
Rapid identification and the ability to attribute actions to asymmetric actors.
Maintenance of democracy.
Cyber defense of data and computing systems.
Protection from /countering of fake news.
Strategic Messaging & Communications
Protection of Government information, health and financial institutions.
Improving situational awareness through critical local intelligence feeds.

INSURGENCY AND COUNTER-INSURGENCY

Provision of policing and emergency services.
Protection of the community from insurgent activities and reprisals.
Protection of critical infrastructure.
Capacity building.
Improving situational awareness.
Civil support to military and police operations.
Improving situational awareness through critical local intelligence feeds.

HUMANITARIAN ASSISTANCE & DISASTER RELIEF

Provision of functional expertise.
Provision of manpower and equipment.
Protection of critical infrastructure.
Delivery of aid and financial assistance.
Capacity building.
Control of disease.
Improving situational awareness.

ENDURING REQUIREMENTS

Access to critical services such as Government and banking.
Access to energy.
Access to shelter.
Access to water, sanitation and food.
Access to health services and treatment.
Access to communications and data.
Access to transportation.

CONSIDERATIONS FOR URBAN PROTECTION OF CIVILIANS

Urban Resilience and the Protection of Civilians

Many of the factors identified above were incorporated by NATO into its Resilience Agenda, adopted at the 2016 Warsaw Summit, at which Allied leaders committed to enhancing resilience through seven baseline requirements for civil preparedness.³⁸ These requirements, articulated in the Warsaw Summit Communiqué,³⁹ included:

- Assured continuity of government and critical government services;
- Resilient energy supplies;
- Ability to deal effectively with uncontrolled movement of people;
- Resilient food and water resources;
- Ability to deal with mass casualties;
- Resilient civil communications systems; and
- Resilient civil transportation systems.

Each of these considerations is equally relevant for those working to address conflict prevention, protection of civilians during conflict, and civil resilience in the aftermath of urban conflict. The consistency of factors for success suggests that principles of societal resilience and the robustness of urban systems are equally important aspects of urban protection of civilians. This approach, alongside the more traditional IHL considerations of restraints on combatants' military behavior, joins the ambition to take proactive steps to physically protect civilians who adversaries may seek to harm.

Urban Rules of Engagement

Urban rules of engagement (ROE) by their very nature are normally constraints on military operations, but they may contain instructions to use force to defend or protect civilians, critical infrastructure or sites of historical/religious importance. In terms of combatant behavior itself, recent Australian experimentation suggests that the protection of civilians during conflict is likely to be significantly enhanced in urban areas by following “urban special instructions” which are normally contained in an Annex to the issued ROE. These instructions are in addition to the standard ROE that normally are applied under IHL. These special instructions may include, for example, defining certain portions of an urban zone as densely populated areas (DPAs) within which additional restrictions or limitations on tactics or weapon systems apply.⁴⁰ Additional urban limitations or constraints could include some or all of the following:

- ROE may specify, for example, that military strikes only be conducted following an ISR soak of a specific duration,⁴¹ on a specified number of separate occasions, periods of the day and days of the week, over a certain period of time, in order to establish and/or confirm the pattern of life in densely populated areas.⁴²
- In the absence of such confirmed pattern of life, ROE might specify that operations in DPAs must be conducted on the assumption of an evenly-spread population density in the area, equal to the greatest known population density in any adjoining area, or a specified number of persons per square kilometer, whichever is greater.
- ROE might specify that planning for operations in DPAs must make provision for regular humanitarian pauses to allow aid to reach impacted civilians, or enable their evacuation, and must make provision for humanitarian corridors by which aid may reach impacted civilians and civilians can be evacuated from conflict areas.

- In relation to use of specific weapons, means, and methods of warfare, ROE might prohibit the use of explosive weapons with warheads larger than a specified size in DPAs, except where essential to protect troops in contact, civilians, or other non-combatants, and might require that all explosive weapons employed in DPAs must be individually targeted and singly launched. Salvo or multiple launch fire might be prohibited, while close air support aircraft may be permitted to only launch one munition per target per approach/strike. ROE might require that non-explosive kinetic warheads be used instead of explosive warheads wherever possible.
- Where explosive warheads are necessary, ROE or urban special instructions might require the use of “focused lethality munitions” such as munitions employing carbon-fiber casings wherever possible, rather than conventional metal casings.
- Where explosive warheads with conventional casings are necessary, ROE might specify that warheads with directed (shaped) charges are to be preferred over fragmentation warheads.
- For reasons of protecting critical infrastructure, ROE or urban special instructions may restrict the use of explosive warheads in strikes where there is a likely impact on services (electricity, water, sewage, health etc.) on which the civilian population relies, except where essential to protect troops in contact, civilians, or other non-combatants.
- ROE may prohibit the use of indirect fire weapons, such as rockets or artillery, and may restrict the use of obscurants (smoke) and teargas, as well as “dumb” (non-precision) or airburst munitions (with the possible exception of hand launched or shoulder fired grenades) in DPAs, except where essential to protect troops in contact, civilians, or other non-combatants.
- ROE may restrict communications jamming or cyber operations that negatively affect civilian and humanitarian communications, banning the use of jamming or cyber against certain targets or limiting jamming to specified bands of the electromagnetic spectrum, or to a specified number of hours per day.
- Commanders may discourage the practice of tunnelling through adjacent civilian buildings to reach a target and encourage junior commanders to consider ways to achieve their military objectives without damage to civilian property.

Commanders operating in urban areas may also incorporate legal advisors, local government liaison personnel, and local community representatives into planning efforts, and integrate protection of civilian activities with NGOs and international institutions. These efforts, where possible, may include the active protection of civilians and critical infrastructure from harm or destruction by opposing forces.

CONCLUSION

As urban areas expand to account for an ever-greater proportion of the world's population, commercial and government activity, and critical infrastructure – and as conflict increasingly occurs in and around cities – the protection of civilians in urban environments will become both increasingly important and significantly more difficult for NATO and other military coalitions. The traditional military desire to avoid urban warfare will become even less achievable. Rather, the increased complexity of smart cities, connected infrastructure, coastal urban areas, and networked urban populations will place a premium on understanding and protecting urban systems writ large, not solely urban inhabitants. Emerging threats, from irregular forces through hybrid and conventional forces to peer and near-peer adversaries, will further complicate the protection of civilians in an urban environment. Emerging technologies will also exacerbate the threat to civilians while complicating the challenge for military forces to operate effectively. These emerging threats and technologies will require civilian and military organizations to regularly review their urban policies and doctrine to ensure they are prepared for the future urban operational environment.

Some of these challenges already are evident, as seen from the experiences in the battles of Mosul and Marawi – just two out of dozens of recent urban engagements. These cases offer complementary lessons on the implications for the protection of civilians in circumstances where civilians faced real threats: they remained trapped in urban areas in large numbers during high-intensity combat, or they successfully evacuated but then required extensive and ongoing humanitarian support. These cases demonstrate the clear need for coordination among local authorities, host-nation governments, international military forces, NGOs and international organizations, and the requirement for resilience efforts to strengthen protection of civilians ahead of conflict. Strengthening resilience, ahead of crisis, across requirements such as continuity of government and critical services, energy, ability to handle displaced persons and mass casualties, food and water, civil communications systems and transportation systems will help in protecting civilians should conflict arise. Combatant behaviors may be constrained by ROE and ISR requirements designed to minimize civilian casualties, limitations on certain types of weapons or methods of warfare, requirements for IDP handling and humanitarian support, and the need for humanitarian pauses during battle or humanitarian corridors enabling civilians to be evacuated or aid to reach a beleaguered population. Wherever possible, facilitating the safe departure of civilian populations from a city before large-scale combat remains an important aspiration for military forces. At the same time, however, the examples cited in this paper unfortunately suggest that large-scale and safe evacuation will rarely be achievable.

“As urban areas expand to account for an ever-greater proportion of the world’s population—and as conflict increasingly occurs in and around cities—the protection of civilians in urban environments will become both increasingly important and significantly more difficult.”

As this paper shows, protection of civilians in cities will be not just a necessary part of future war, but one of its most important aspects. Future coalition operations and missions led by NATO need to understand and address preparedness for such scenarios and integrate understanding of urban terrain with the need to anticipate threats facing civilians that have strategic consequences. That approach requires going beyond traditional warfighting views of protection of civilians as a matter of IHL to integrate NATO policies that emphasize the need to protect civilians from the harm of other perpetrators or from NATO's own operations. This paper identifies a set of NATO policies that each tackle part of that challenge: the Protection of Civilians Policy, Joint Military Operations in the Urban Environment and the Resilience Agenda. Each of these policies can support the other as NATO leaders look to prepare for urban, tactical choices that will have strategic consequences for operations, for achieving the political aims of missions, and for urban civilian populations facing conflict.

ENDNOTES

- 1 NATO's *Policy on the Protection of Civilians* states: "Protection of Civilians (persons, objects and services) includes all efforts taken to avoid, minimize and mitigate the negative effects that might arise from NATO and NATO-led military operations on the civilian population and, when applicable, to protect civilians from conflict-related physical violence or threats of physical violence by other actors, including through the establishment of a safe and secure environment." North Atlantic Treaty Organization, "NATO Policy for the Protection of Civilians," (Warsaw: June 2016), https://www.nato.int/cps/en/natohq/official_texts_133945.htm.
- 2 Examples of urban battles that decided the outcome of a war or altered the course of a campaign include Stalingrad 1942, Monte Cassino 1944, Berlin 1945, Hue City 1968, Mogadishu 1993, Grozny 1994, Fallujah 2004, Baghdad 2007, Aleppo 2012-17, Second Donetsk Airport 2015, Ilovaisk and Debalt'seve 2015, Mosul 2014-17 and Raqqa 2018.
- 3 Harm to one group of civilians could also shift the dynamics of the conflict, for example. A planned Stimson Center and NATO Wargame in October 2021 will seek to address the protection of civilians and infrastructure during an Article V operation in an urban environment. The lessons identified from the wargame will be fed back into the NATO Protection of Civilians Handbook.
- 4 Peer-on-peer conflict in this example refers to a NATO v. Russia scenario.
- 5 United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2018 Revision* (New York: United Nations, 2019), <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf>.
- 6 See David Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla* (New York: Oxford University Press, 2013), 239; Kendall D. Gott, *Breaking the Mold: Tanks Into the Cities* (Ft. Leavenworth, KS: Combat Studies Institute Press, 2006), ix-xi; Ian Klaus "Intuition, the City, and War," *Modern War Institute*, August 1, 2019, <https://mwi.usma.edu/intuition-city-war/>.
- 7 North Atlantic Treaty Organization, "NATO Policy For the Protection of Civilians: Endorsed by the Heads of State and Government participating in the meeting of the North Atlantic Council in Warsaw 8-9 July 2016," (2016). https://www.nato.int/cps/en/natohq/official_texts_133945.htm.
- 8 Ibid.
- 9 North Atlantic Treaty Organization, Supreme Allied Commander Transformation, "Framework for Future Alliance Operations," (2015), 5. <https://www.act.nato.int/images/stories/media/doclibrary/ffao-2015.pdf>.
- 10 Government of United Kingdom, Ministry of Defence, "Strategic Trends Programme: Future Operating Environment 2035," (Shrivenham: HMG Publishing Service, 2014). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/646821/20151203-FOE_35_final_v29_web.pdf.
- 11 North Atlantic Treaty Organization, "Capstone Concept: Joint Military Operations in an Urban Environment," NATO SH/SDP/J5/STP1/VP/18-000452 (2018).
- 12 Ibid.
- 13 *The putative "feral city" is (or would be) a metropolis with a population of more than one million people in a state the government of which has lost the ability to maintain the rule of law within the city's boundaries yet remains a functioning actor in the greater international system.* Richard J. Norton, "Feral Cities," *US Naval War College Review* 56, no. 4 (2003): 2, accessed May 11, 2021, <https://digital-commons.usnwc.edu/nwc-review/vol56/iss4/8/>; See also Kilcullen, *Out of the Mountains*, 52, 67.
- 14 Norton, "Feral Cities," 2.
- 15 Ibid.

- 16 North Atlantic Treaty Organization, “Concept for the Protection of Civilians,” (2018).
- 17 David Kilcullen. *The Conduct of future operations in the urban littoral and its implications for NATO*. (Norfolk, VA: NATO Allied Command Transformation Urbanization Project, 2015).
- 18 Martin Fink, “Naval Blockade and the Humanitarian Crisis in Yemen,” *Netherlands International Law Review* 64 (2021): 291-307, accessed May 11, 2021, <https://link.springer.com/content/pdf/10.1007%2Fs40802-017-0092-3.pdf>; United Nations Security Council, *As Conflict, Humanitarian Crisis Grows, Yemen ‘Speeding towards Massive Famine’, Under-Secretary-General Warns, in Briefing to Security Council*. SC/14470, 16 March 2021, <https://www.un.org/press/en/2021/sc14470.doc.htm>.
- 19 North Atlantic Treaty Organization, “Science & Technology Trends 2020-2040: Exploring the S&T Edge,” NATO Science & Technology Organization, (2020). https://www.nato.int/nato_static_fl2014/assets/pdf/2020/4/pdf/190422-ST_Tech_Trends_Report_2020-2040.pdf.
- 20 TNO - Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek (Netherlands Organization for Applied Scientific Research). The MARVEL model is an analysis tool that was developed by TNO to increase understanding of the urban environment and analyse the effects, variables and causal relations of military actions on an urban area and its population.
- 21 A hybrid adversary uses a combination of military and non-military means, including disinformation, cyber-attacks, economic pressure, deployment of irregular armed groups and use of regular forces to destabilise and undermine societies.
- 22 Arnos C. Fox, *The Mosul Study Group and the Lessons of the Battle of Mosul*, Land Warfare Paper 130 (Washington DC: Association of the United States Army, 2020), 8.
- 23 Ibid.
- 24 Mosul Study Group, “What the Battle for Mosul Teaches the Force,” no. 17-24 U (Fort Eustis, VA: Army University Press, 2017), 5,8, <https://www.armyupress.army.mil/Portals/7/Primer-on-Urban-Operation/Documents/MosulPublic-Release1.pdf>.
- 25 Mosul Study Group, 67-8.
- 26 Ibid. 38.
- 27 Ibid. 38.
- 28 Ibid. 68.
- 29 Australian Strategic Policy Institute, “The Marawi Crisis — Urban Conflict and Information Operations,” Charles Knight and Katja Theodorakis (2019). <https://www.aspi.org.au/report/marawi-crisis-urban-conflict-and-information-operations>.
- 30 Ibid.
- 31 Ibid. 9.
- 32 Ibid. 10.
- 33 Ibid.
- 34 Knight and Theodorakis, *The Marawi Crisis*, 8.
- 35 “Troops kill five militants in besieged Marawi city,” *Gulf Times*, September 13, 2017, <https://www.gulf-times.com/story/563655/Troops-kill-five-militants-in-besieged-Marawi-city>.
- 36 See Ervin Malicdern, “Post-war Status of Structures at the Main Battle Area of the Marawi Siege,” (2017). https://www.academia.edu/35344140/Post_war_Status_of_Structures_at_the_Main_Battle_Area_of_the_Marawi_Siege.
- 37 Ibid.
- 38 North Atlantic Treaty Organization, “Warsaw Summit Communiqué Issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Warsaw 8-9 July 2016,” (2016). https://www.nato.int/cps/en/natohq/official_texts_133169.htm.
- 39 Ibid.

- 40 The following constraints are adapted from University of New South Wales, *UNSW Urban Wargame 2035: Rules of Engagement*, (2021).
- 41 An ISR soak is the use of intelligence and surveillance assets (human, air, ground and space) to monitor an assigned area consistently over a given period to build up knowledge of the operational area.
- 42 A pattern of life analysis is developed from the use of ISR assets to monitor a specific group/set of behaviours and movements in a given area over a given period of time.

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