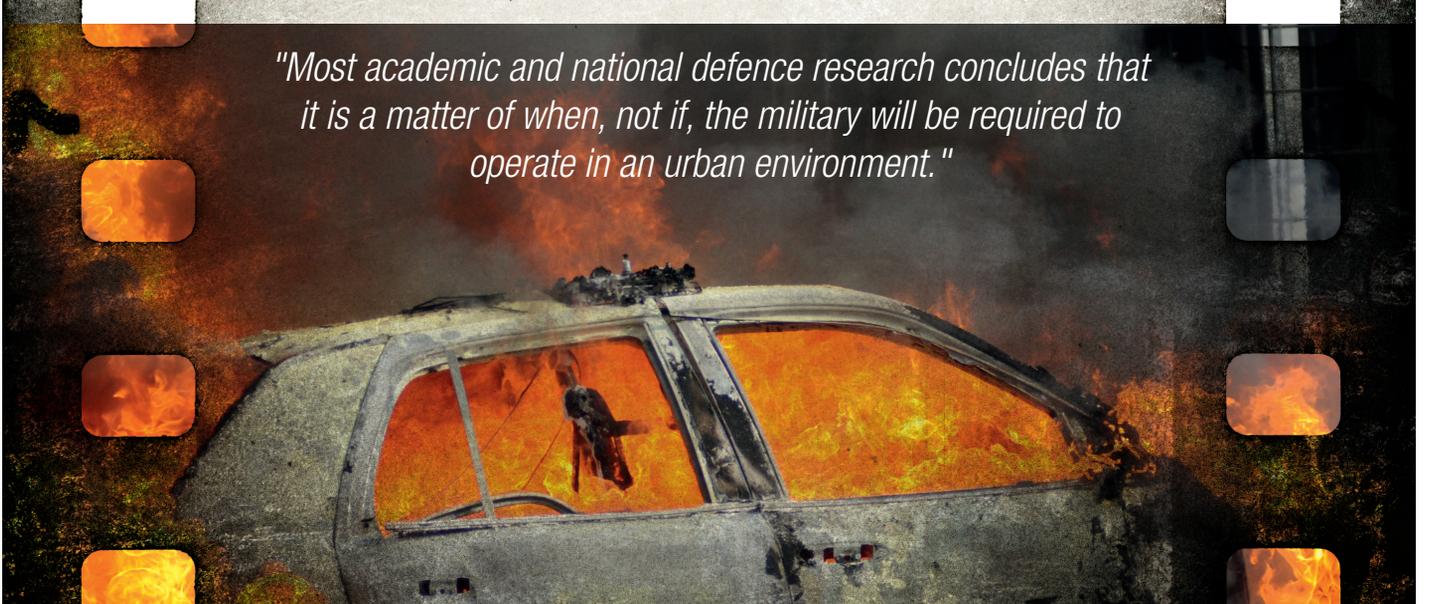


"Most academic and national defence research concludes that it is a matter of when, not if, the military will be required to operate in an urban environment."



*"The future character of conflict has been described by the **5Cs**. They may not be applicable for all environments, but they absolutely resonate with the future urban battlespace: it will be more **congested**, more **cluttered**, more **contested**, more **connected**, and more **constrained**. (...) It is critical for NATO to think in this space, and remain adaptable and resilient enough to operate in the most challenging physical and human environment. It is not if we have to, but when we have to... and we need to get it as right as possible, when we do."*

**~ Brigadier Ian Rigden, British Army
Head of Land & Research Development,
Concepts and Doctrine Centre**

NEW CONCEPTS

JOINT URBAN OPERATIONS AND THE NATO URBANISATION PROJECT

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Introduction

The Military Committee (MC) tasked Headquarters Allied Command Transformation (HQ SACT) to deliver a Bi-Strategic Command Concept "NATO Conceptual Study on Urbanisation" by 31 March 2016 that examines the impact of the urbanisation trend on NATO military operations between now and 2035. The NATO Strategic Foresight Analysis (SFA)¹ had identified that urbanisation was a future strategic trend of concern and should be monitored closely. The NATO Framework for Future Alliance Operations (FFAO)² went further and identified three urbanisation related "instability situations" that could impact future NATO operations significantly:

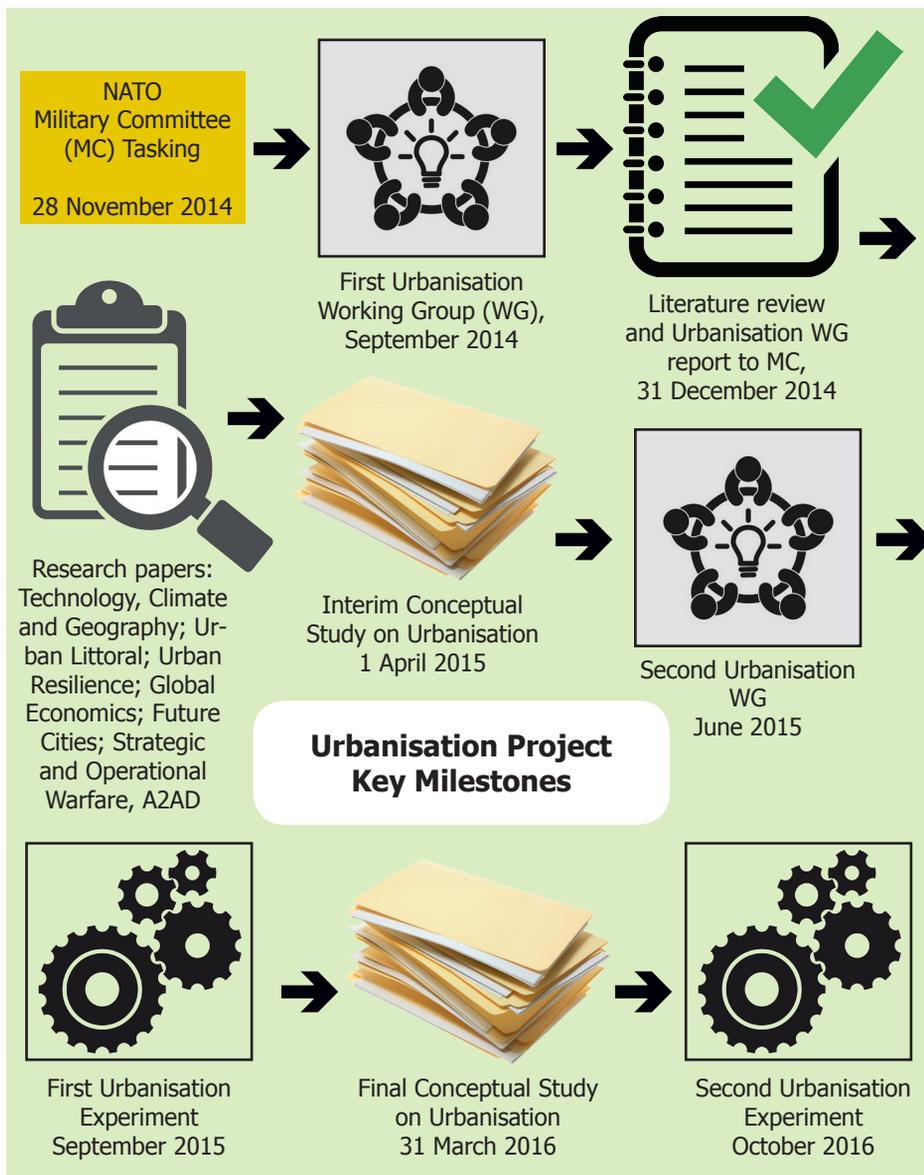
- Natural disaster,
- Mass migration, and,
- Megacity turmoil.

The MC tasking also added the requirement to consider hybrid warfare and high-intensity conflict within the inner city turmoil instability situation.

The Urbanisation Project was initiated through Concept Development and Experiment (CD&E) Engagement with NATO Nations in late 2013. In 2014, a number of workshops were held to gather together urbanisation experts, strategic foresight experts and national defence planners to distil their knowl-

edge. At the start of the project, a number of gaps in existing urbanisation literature were identified and HQ SACT commissioned eight academic research papers to assist in answering the "so what" on urbanisation for NATO. Additionally, a Limited Objective Experiment was executed at the Rome-based Modelling and Simulation Centre of Excellence (M&S COE) in September 2015. The experiment explored future urban scenarios in order to gain additional insights and identify gaps in future capability and capacity requirements associated with the three FFAO instability situations mentioned above. To date, 17 NATO Nations (Bulgaria, Czech Republic, Denmark, Esto-





population in the developing world will jump from 2.9 billion in 2015 to 4.3 billion in 2035.

Moreover, the urban environment is also changing rapidly. Technology is already affecting how people live and work in urban environments; for example the use of social networks for everything from organising large-scale gatherings to reporting news events instantly; to buying goods and possibly having them delivered by unmanned drones. NATO will have to adapt to this changing environment of rapidly increasing population.

The future cities will be hard to navigate—the streets will be narrow and congested, as will the airspace; and the rise of slums will also increase the likelihood of no-go areas for parts of the population. The paucity of major highways and other routes running through city centres will mean that military movements could become entirely predictable. Cities will have a vertical as well as a horizontal dimension, and the subterranean space underneath a city will also have to be considered as part of the future operating environment.

This future operating environment can best be summed up as the "9 or 10 Domain Challenge" (the diagram on the next page) and NATO planners of the future will need to con-

nia, France, Germany, Hungary, Italy, Latvia, Lithuania, The Netherlands, Norway, Poland, Slovenia, Spain, Turkey, United Kingdom and United States), the United Nations, the City of San Francisco, NATO Allied Command Operations (ACO), 17 NATO Centres of Excellence, universities in Italy, United Kingdom and the United States have all contributed to the Urbanisation Conceptual Study and Experiment. A detailed breakdown of the project timeline—the milestones and key deliverables—is provided in the diagram above.

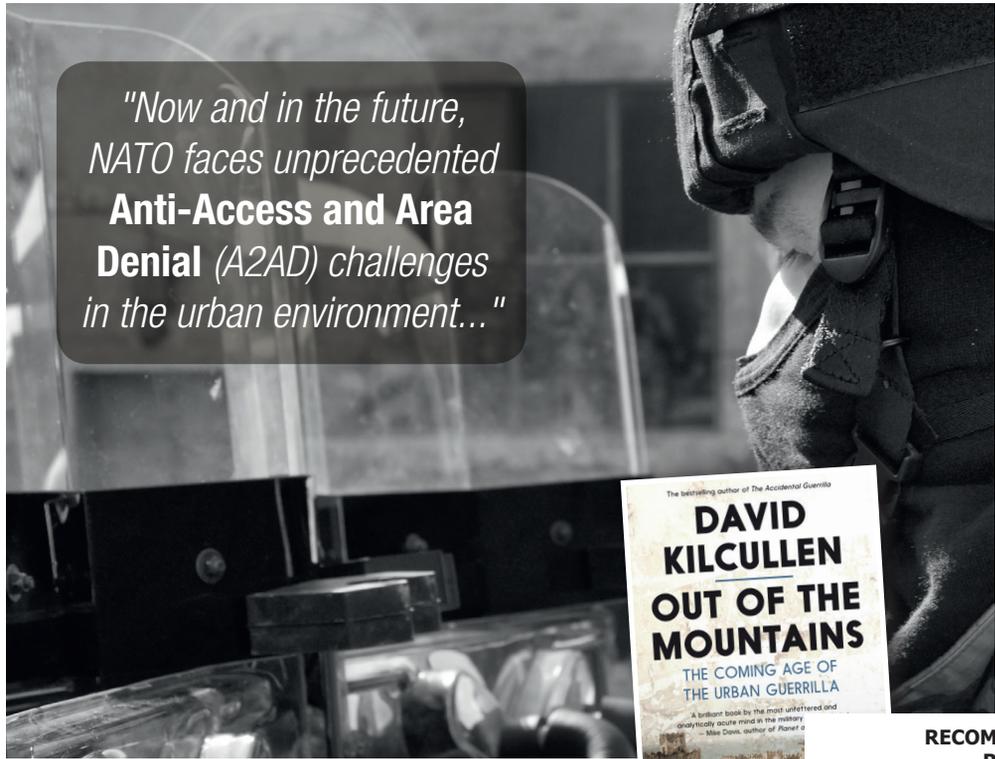
The urbanisation challenge

Urbanisation can be defined³ as the increase of the share of the urban residents amongst the total population. It is driven by two processes:

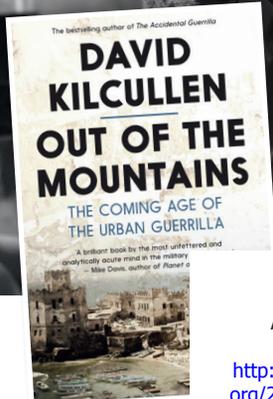
- Net internal migration, from rural to urban areas, and net international migration into urban areas,
- The natural population growth of urban areas (e.g. the excess of births over deaths in the cities).

According to a recent United Nations report⁴ more people live in urban areas today than in rural areas—with 54% of the world's population residing in urban areas. In 1950, 30% of the world's population was urban, and by 2050, 66% of the world's population is projected to be urban. The western world is already urbanised, with 78% of people living in urban areas. Developing countries are experiencing a rapid rate of urbanisation, and this, combined with large population growth, means that the urban





*"Now and in the future, NATO faces unprecedented **Anti-Access and Area Denial (A2AD)** challenges in the urban environment..."*



RECOMMENDED READING:

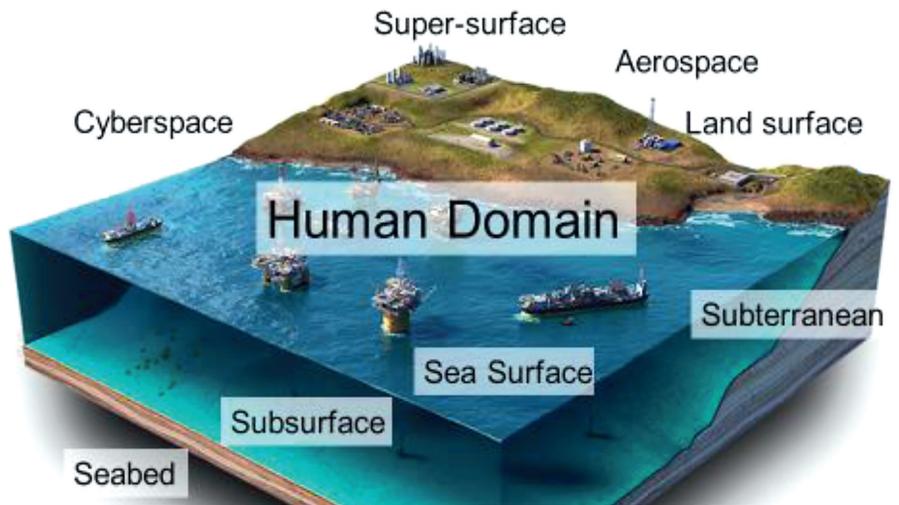
A future perspective of warfare, read more at <http://henryjacksonsociety.org/2013/09/25/out-of-the-mountains-the-coming-age-of-the-urban-guerrilla/>

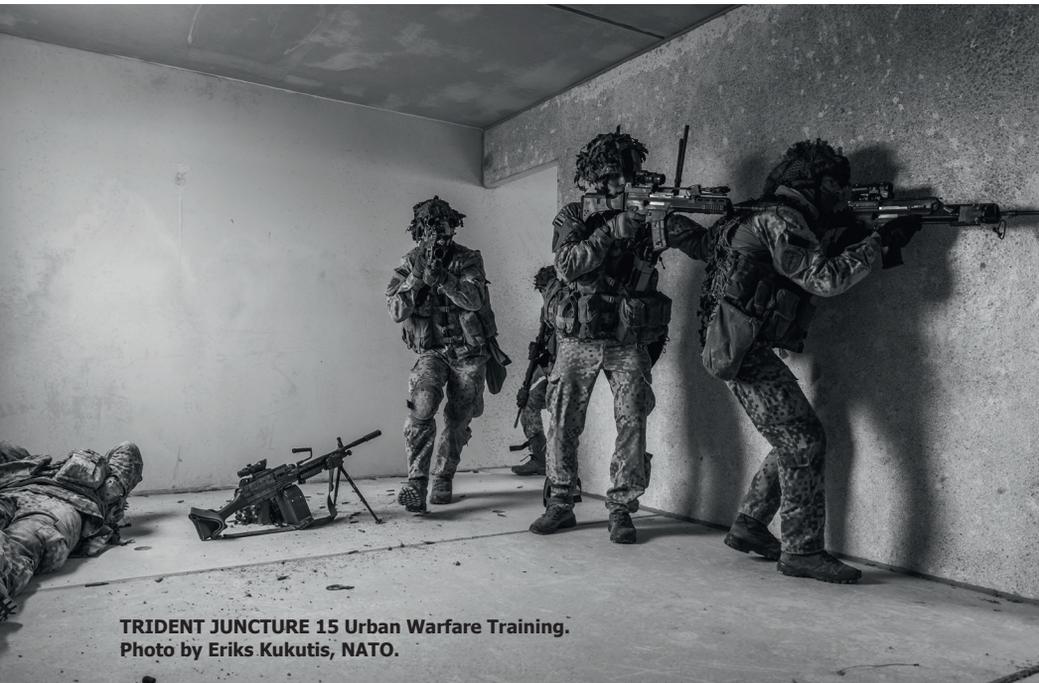
sider all aspects of this challenge when developing a fully comprehensive operational plan. Now and in the future, NATO faces unprecedented Anti-Access and Area Denial (A2AD) challenges in the urban environment and littoral approaches. A2AD aggression threatens not only power projection, but also Collective Defence in the Alliance's border regions. Both state and non-state competitors continuously challenge NATO's security via cyber intrusions, multi-dimensional surveillance, support of proxy militias, and psychological operations aimed at provoking anti-Western sentiments. Hybrid threat tactics, empowered non-state actors, and the proliferation of advanced weapons systems pose a future threat dilemma that is as unpredictable as it is dangerous. Competitors will exploit the vulnerabilities, resources, and sanctuary of strategically situated cities to deny NATO access to key points of entry and limit freedom of action within the mission space. They will persuade or terrorize civilians into participating—willingly or otherwise—in a comprehensive A2AD strategy that employs physical, virtual, and psychological components to pose dangerous obstacles to both military forces and vulnerable civilian populations.⁵ History shows that military opera-

tions tend to be where the population resides, whether it is assistance in the event of a natural disaster or crisis response during a period of unrest. NATO countries have relatively little recent experience of operating in large urban areas, with the focus over the last decade being on Afghanistan. Furthermore, most academic and national defence research concludes that it is a matter of when, not if, the military will be

required to operate in an urban environment, however training and capabilities for such an environment are lacking at this time, and NATO has yet to adapt to the changing landscape of cities.

The 9 or 10 Domain Urban Environment
Dr David Kilcullen, 2014





TRIDENT JUNCTURE 15 Urban Warfare Training.
Photo by Eriks Kukutis, NATO.

"NATO expeditionary forces are likely to operate in urban, often littoral, environments in the developing world on multiple occasions between now and 2035."

The "so what" for NATO

Urbanisation will be one of the most significant dynamics affecting the future, presenting both opportunities and risks.⁶ This will be accompanied by increased demand for natural resources—particularly water, energy, and food—creating stresses as vital municipal services and systems come under increasing pressure. As more people live in urban areas,⁷ which become ever more central to the way people live, armed forces will need to develop ways of delivering military effect in this environment. Failed and failing cities, in both developed and developing countries, could pose major security challenges.

Taking the large-scale trends together, a clear pattern emerges.⁸ Rapid urban growth in coastal, underdeveloped areas is overloading economic, social and governance systems, straining city infrastructure, and overburdening the carrying capacity of cities designed for much smaller populations. This is likely to make the most vulnerable cities less and less able to meet the challenges of population growth, coastal urbanisation, and connectedness. The implications for future conflict are profound, with more people competing for scarcer resources in crowded, under-serviced and under-governed urban areas. Rapid urbanisation and inadequate socio-economic infrastructure are likely to increase the number

and scale of densely populated slums. Such areas are likely to be more prone to social unrest. Urbanisation concentrates populations, potentially making them more vulnerable to the effects of natural disasters, disease and deliberate acts of violence. With most urban areas likely to be in coastal regions, cities will be particularly vulnerable to the effects of rising sea levels. Megacities⁹ may also offer safe haven for threat groups who wish to strike NATO while simultaneously megacities' links to national interest only grow stronger over time. This dichotomy of threat conjoined with growing criticality will produce a complex security environment, which will challenge policy makers and military planners.

Therefore, NATO¹⁰ expeditionary forces are likely to operate in urban, often littoral, environments in the developing world on multiple occasions between now and 2035, as the global population increasingly urbanises, especially in developing countries, and as urban centres continue to cluster on coastlines. (This is not to suggest that operations in remote environments, including the global commons, will not still occur—they will, and capabilities for these kinds of operations will remain critical. It is just that, with an increasing proportion of the world's population and economy clustered in urban littoral areas, operations in the urban littoral will become an increasingly large proportion of the whole).

The military implications

NATO must view urbanisation as both a challenge and an opportunity. We must exploit our superior professionalism, fleeting technological edge, and compelling ideological narrative to produce our own asymmetric advantages and overmatch substantial competitor investments in A2AD systems across all domains.

As highlighted in the NATO Smart Defence principle, future capability contributions must be affordable, feasible, and relevant. Our operational concepts specify the requirement for enhanced situational awareness, redundant capabilities, enhanced partnerships, and joint solutions for combined arms entry operations. Future technologies including autonomous systems, directed energy, and robust deployable networks will reduce the costs to generate a lighter, lethal and agile force, but will likewise provide new options for adversaries if our research is not jealously safeguarded.

Equipment programmes must focus more on the requirement for NATO to be able to operate in complex, and, in particular, urban terrain in the future. Most important for success is the ability for all elements, whether mounted, dismounted, in the air or in the littoral, to be able to communicate without congesting nets to a point where they become unworkable. NATO will need a number of new technologies to deal with the threat posed by



the urban environment, all of which will need to be considered from both an offensive as well as a defensive standpoint—that is, how NATO forces can field and employ such technologies to their own advantage as well as protecting against possible use by an adversary.¹¹

The following principal categories of technology development will have the greatest impact on future urban environments: Food and water technologies, travel and transportation, mass surveillance, energy production, storage and distribution, communications, unmanned (autonomous) systems, human performance enhancements, data management and processing, and advances in architecture, open source design and advanced manufacturing technologies including additive manufacturing.

Training and exercises

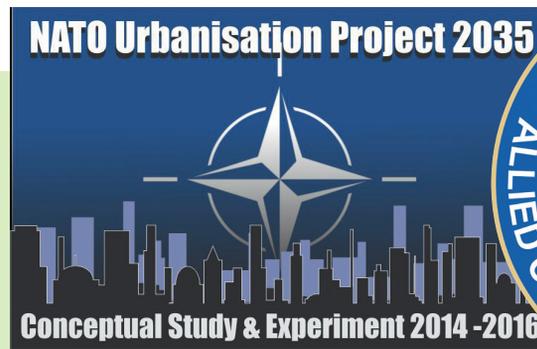
So, how can the recommendations of the study be applied to NATO training, integrating all aspects of operational level planning and execution—the Joint Warfare Centre’s domain?

To meet the urban and urban littoral challenge out to 2035, NATO needs to prepare for these eventualities explained above. If the Alliance wants to be successful in future urban conflicts, adaptation and continual training is not an option; it is a must.

Furthermore, adapting the mindset of leaders, and as a result the organisational culture, and particularly those leadership elements responsible for achieving information dominance are absolutely necessary to successfully operate within the urban environment.

Current NATO urban training areas are small in scale, designed to train Army units tactically and are built inland. NATO must consider the construction of a specialist Urban and Urban Littoral Training Area. The training area must be large with appropriate live and simulated training facilities and replicate the intellectual, physical, psychological and emotional challenges posed by Urban Operations.

Additionally, it must be built on the coast with port and airport facilities, buildings higher than 10 stories, complex subterranean structures, a riverine area, an industrial complex— Chemical, Biological, Radiological and Nuclear (CBRN) simulation—and cluttered airspace to allow Urban and Urban Littoral Operations to be exercised at the Joint and Comprehensive level. To meet the challenges



For these related stories, visit www.act.nato.int/urbanisation

— Why is the Urbanisation Study and Experiment important?

In 2008, the world as a whole passed the 50% threshold of individuals living in cities as opposed to the countryside. The western world is already urbanised, with 78% of people living in urban areas. Developing countries are experiencing a rapid rate of urbanisation, and this combined with large population growth means that the urban population in the developing world will jump from 2.9 billion in 2015 to 4.3 billion in 2035. History has shown that military

operations tend to be where the population resides, whether it is assistance in the event of a natural disaster or crisis response during a period of unrest. Academic and National Defence research share the same conclusion that it is a matter of when, not if, the military will be required to operate in urban environments. Therefore, the Alliance needs to identify possible gaps in training, requirements and capabilities, adapting to the changing landscape of cities in order to successfully tackle potential security challenges in urbanised systems.

posed by operating in the urban environment, urban tactics, techniques, and procedures (TTPs) should become mandatory for all arms during collective training. To achieve this suitable training, resources will need to be made available throughout the training progression. This training must be either a Command Post Exercise (CPX) or amongst the population, and include the full range of planning and tactical actions from offensive and defensive to enabling and stabilising actions. The latter will require training alongside the full range of civilian agencies to provide a fully Comprehensive/Whole-of-Government Approach. Investments in education and training will round out NATO’s professional edge, emphasizing mission awareness, agile and empowered leadership, and professional restraint down to the lowest tactical levels.¹² In sum, it is highly recommended to include and plan an Urban, Urban Littoral and Megacity LIVEX/CPX in the NATO 2017-2018 Military Training and Exercise Programme (MTEP) to further develop the recommendations and capabilities outlined in the NATO Urbanisation Conceptual Study which will help provide valuable lessons learned into Capability Development. ✦

END NOTES:

- (1) HQ SACT-Strategic Foresight Analysis Paper dated 11 September 2013.
- (2) NATO Framework for Future Alliance Operations, dated 9 April 2014.
- (3) HQ SACT Urbanisation Literature Review, dated 1 November 2014.
- (4) UN Department of Economic and Social Affairs, World Urbanisation Prospects, dated 2014.
- (5) HQ SACT Research Paper-Future A2AD Challenges Posed by Urban Centre to 2035.
- (6) Royal Dutch Shell-New Lenses on Future Cities, dated 2014.
- (7) United Kingdom-Global Strategic Trends, dated 12 February 2014.
- (8) HQ SACT Research Paper-Climate and Geographical Implications for Future Urban Operations, dated 5 January 2015.
- (9) United States Chief of the Army Strategic Studies Group-Megacities and the United States Army, dated June 2014.
- (10) HQ SACT Research Paper, Technology and its Implications for a Future Urban Environment, dated 18 December 2014.
- (11) HQ SACT Research Paper-Technology and its Implications for a Future Urban Environment, dated 18 December 2014.
- (12) HQ SACT Research Paper-Future A2AD Challenges Posed by Urban Centre to 2035.