NATO STANDARD

ATP-3.2.1.2

CONDUCT OF LAND TACTICAL OPERATIONS IN URBAN ENVIRONMENTS

Edition A, version 1

MAY 2022

NORTH ATLANTIC TREATY ORGANIZATION

ALLIED TACTICAL PUBLICATION

Published by the
NATO STANDARDIZATION OFFICE (NSO)

INTENTIONALLY BLANK

NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

12 May 2022

1. The enclosed Allied Tactical Publication ATP-3.2.1.2, Edition A, version 1, CONDUCT OF LAND TACTICAL OPERATIONS IN URBAN ENVIRONMENTS, which has been approved by the Nations in the MILITARY COMMITTEE LAND STANDARDIZATION BOARD, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 6509.

2. ATP-3.2.1.2, Edition A, version 1, is effective upon receipt and supersedes ATP-99, Edition A, version 1, which shall be destroyed in accordance with the local procedure for the destruction of documents.

3. No part This NATO standardization document is issued by NATO. In case of reproduction, NATO is to be acknowledged. NATO does not charge any fee for its standardization documents at any stage, which are not intended to be sold. They can be retrieved from the NATO Standardization Document Database (https://nso.nato.int/nso/) or through your national standardization authorities.

4. This publication shall be handled in accordance with C-M(2002)60.

Dimitrios SIGOULAKIS
Major General, GRC (A)
Director, NATO Standardization Office

INTENTIONALLY BLANK

RESERVED FOR NATIONAL LETTER OF PROMULGATION

INTENTIONALLY BLANK

RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
ITA	“The Italian Navy does not support glossary/lexicon terms, definitions or contents, related to riverine operational sphere that are not harmonized with ATP-08 Vol. III because it misleads and is not related to the pertinent amphibious warfare area. ITA Navy personnel is directed to use ATP-08 Vol. III. The standard will be applied and the reservation will be lifted when relevant frameworks and constructs are corrected”.
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

INTENTIONALLY BLANK

RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]

Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.

INTENTIONALLY BLANK

TABLE OF CONTENTS

INTENTIONALLY BLANK

PREFACE

Context

1. ATP-3.2.1.2 – *Conduct of Land Tactical Operations in Urban Environments* is a subordinate document to the keystone publication for land operations, AJP-3.*2* – *Allied Joint Doctrine for Land Operations* and supplements ATP-3.2.1 – *Conduct of Land Tactical Operations* as well as ATP-3.2.1.1 – *Conduct of Land Tactical Activities* to provide specific guidance for operations within urban environments on the tactical level.

Scope

2. ATP-3.2.1.2 is the overarching NATO tactical doctrine for operations in urban environments. It covers the fundamental principles of full-spectrum operations in urban environments. This edition is updated to ensure coherence with the new editions of basic land doctrine.

Purpose

3. The purpose of the publication is to provide NATO and partner nations with a common understanding and approach to the planning and execution of a wide range of operations in urban environment, forming a common basis for formations, units and sub-units in order to enhance interoperability during NATO-led multinational operations in an urban environment.

Application

4. ATP-3.2.1.2 is written for commanders and their staffs from the land component commander down to battalion level or even below where sub-units operate in an urban environment employing combined arms principles.

5. Acknowledging that in an urban environment the combined arms principles have to be applied at much lower levels than in traditional environments, all leaders at each echelon need to be aware of both combined arms principles and the specifics of operating in an urban environment.

Structure

6. This document covers the characteristics and fundamentals of operating in an urban environment, as well as the necessary approach to operations in this environment and its tactical implications.

Linkages

7. ATP-3.2.1.2 was developed in accordance with AJP-3.2 – *Allied Joint Doctrine for Land Operations* and supplements ATP-3.2.1 – *Conduct of Land Tactical Operations* and ATP-3.2.1.1 – *Conduct of Land Tactical Activities* to provide coherent and concise doctrine.

The summarized content is:

a. AJP-3.2 - *Allied Joint Doctrine for the Conduct of Operations* provides guidance and describes principles for all land operations within a joint and multinational framework.

b. ATP-3.2.1 – *Conduct of Land Tactical Operations* describes how to plan, orchestrate and coordinate land operations at the tactical level in general.

c. ATP-3.2.1.1 – *Conduct of Land Tactical Activities* describes how to plan, coordinate and execute tactical activities within any land operations.

8. In terms of command and control ATP-3.2.1.2 should be used in close conjunction with ATP-3.2.2 – *Command and Control of Land Forces* and APP-28 *Tactical Planning for Land Forces*.

CHAPTER 1 – THE URBAN ENVIRONMENT

SECTION I – GENERAL

1.1. A greater percentage of the world's increasing population will live in urban areas and as a result, the land area physically covered by towns and cities will continue to increase.

1.2. The urban environment (UE) is a complex interconnected system of systems expressed through a three-dimensional physical system, an information system and a human system comprising a population of significant size and varied configuration[1]. An action in one system can have multiple, sometimes unpredictable effects in the others. An UE can therefore truly be described as complex. Conflict at any scale will magnify any fragilities in its systems. Consequently, an UE is associated with a series of risks, which need to be considered to avoid failure, but the same features also provide opportunities, if properly exploited. A thorough understanding of the UE's interconnected systems is vital to success. Understanding, however, cannot just be conducted during the initial operations planning, so to keep pace with the ever-changing environment, understanding needs to be a continuous activity and conducted at all levels. This will ensure that the whole force shares a common understanding and that commander's intent can still be implemented.

1.3. UEs have high-density populations and man-made structures built to support them. UEs include towns, cities and their surrounding suburbs. Some urban areas might be relatively prosperous, while other areas, possibly only a few miles away, are scarred by un-governed spaces, poverty, and overcrowding. The UE is often described by the 5Cs:

- **c**ongested and **c**luttered by urban terrain and human systems;
- **c**ontested by multiple parties competing for power, influence and money;
- **c**onnected by global perspectives, digital information and communication technologies, media and transport; and
- **c**onstrains the use of force by NATO due to ethics, law, and policy.

SECTION II – THE PHYSICAL SYSTEM

General

1.4. The UE is characterized by a physically functional system of transportation, communications, education, cultural, health, public safety, and utility infrastructures forming a complex matrix of flows, with linkages and nodes that enable the critical flow of water, fuel, electricity, money, people, goods, and waste to sustain the city's function.

[1] This definition applies for the purpose of this document.

1.5. The physical system includes both the natural geographic features (whether it is flat or hilly, the associated drainage and its proximity to the coast) and the man-made infrastructure built to support the urban population on and below the surface. It includes subterranean (e.g. underground), surface, super-surface (e.g. rooftop), and hollow-space[2] environments. The multi-dimensional blend of horizontal, vertical, interior, and exterior forms superimposed on the natural landscape makes the total size of the surfaces and spaces of an urban area many times that of a similarly sized piece of natural terrain.

1.6. In this interdependent urban functional system, distant nodes (water supplies, food sources, transportation modes, energy supplies, outlying towns supporting larger environments) may have significant influence across the entire city.

The physical terrain

1.7. The urban physical terrain is characterized by both natural terrain features such as shorelines or hills, as well as man-made structures, buildings, etc. Generally, the UE can be divided into distinct types of terrain:

a. **Historical centre/old town**, characterized predominantly by large old historic buildings with thick walls.

b. **Financial/business centre**, characterized by high-rise buildings usually constructed of modern building material.

c. **Heavy industrial area**, traditionally located within the outlying UE, characterized by large buildings and factories with heavy operating machinery.

d. **Light industrial area**, traditionally forms a commercial ribbon located around the inner city, predominately constructed of cheap materials.

e. **High density residential**, characterized by both horizontal and vertical buildings, constructed of modern building material.

f. **Low density residential**, traditionally characterized by residential sprawl, consisting of detached and semi-detached housing, constructed of modern building material.

g. **Slum/shanty areas**, characterized by narrow streets and alleys, flat roofs and walls, often areas of significant size, which are complex and cluttered with a changing profile, constructed of cheap or waste material. Due to the frequent changing profile, there is usually little or no mapping.

h. **Subterranean**, located under the other terrain types, ranges from sewer systems to underground railways, car parks, and shopping centres.

See Annex A for more detail.

[2] Hollow-space: Cavity, opening or space within something (e.g., building interiors).

1.8. Cities vary depending on a number of factors such as location, history, culture, civilian population, socio-economic development, climate, building materials, natural terrain, and many other factors. Cities normally consist of a central hub surrounded by satellite areas to form complex networks; rectangular, radial, concentric, or irregular street patterns; and multiple building types that range from single-story wooden, mud dwellings, to high-rise apartments, office buildings, from galvanized metal shops to petro-chemical plants. An example of an urban landscape might be characterized by a very high standard of construction and thick, layered walls found in countries with harsh arctic climates. Another example might include extended family residential compounds surrounded by walls in some cultures. While the UE is complex, many reoccurring and logical patterns can be identified due to the predominance of man-made structures.

1.9. Several common types of buildings, categorized by purpose (residential, commercial, industrial, etc.) and construction type (mass construction, framed, etc.) can be identified. A study of building types is necessary to predict the strength and cover provided by buildings as well as providing building floor plans to aid in operations planning. Furthermore, the UE requires a multi-facet understanding. As with all terrain, it consists of airspace and surface area, but the subterranean and super surface (rooftop) areas must also be considered during planning. Equally important are the effects of the exteriors and hollow spaces of buildings on operations as well as building types and their potential impact on munitions.

1.10. The subterranean landscape is an important part of the physical operating environment (OE) in most urban areas. Much of the subterranean environment is not easily mapped or understood with technologically advanced surveillance but its mapping is usually available through civil/public information sources.

1.11. Military maps may not provide sufficient detail for proper terrain analysis in UEs, and maps obtained from cities could be out of date.

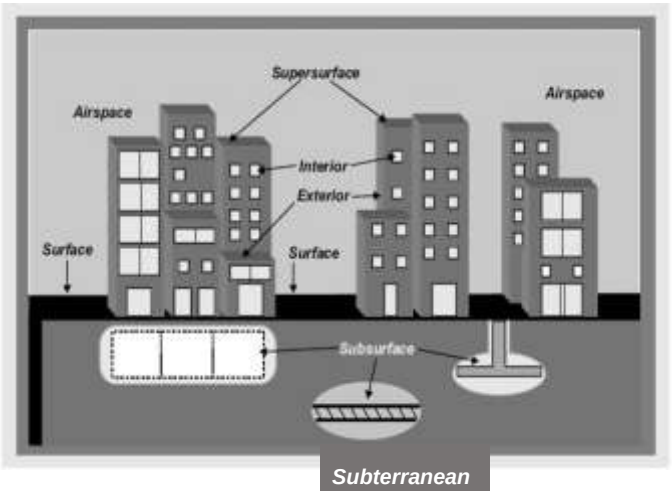


Figure 1-1: The physical terrain

1.12. **Littoral and riverine areas** include those land areas (and their adjacent sea and associated airspace) that are predominantly susceptible to engagement and influence from the sea in the case of littoral areas, while riverine[3] areas encompass wetlands such as deltas, rivers, lakes and artificial waterways, including their banks.

1.13. Complex, man-made physical terrain is likely adjacent to large bodies of water, whose associated port facilities create a range of mobility challenges and opportunities. Big cities are often located on large rivers or on the coast, while some are also located at the mouths of rivers. Those rivers often extend into interior riverine or inland waterways and serve as inland "highways". Ensuring the free use of littorals and rivers may be of crucial strategic, operational, tactical and economic importance. Littorals and riverine areas provide access routes into the UE. In particular, harbours within the UE may serve as points of entry for forces and supplies, for both adversary's[4] and friendly forces' and for the flow of essential goods to the city. Central services essential for a functioning UE, such as facilities, are often located at harbours. General destruction and collateral damage can often cause land lines of communication (LOC) to become blocked or slow down the ability to transport troops, supplies and casualties. Waterways constitute an alternative or even a main LOC.

Urban infrastructure

1.14. The urban infrastructure consists of man-made structures built to support the population. As civilian objects (being all objects which are not military objectives), urban infrastructure is protected under the law of armed conflict (LOAC). Buildings that fulfill purposes critical to the lives of the civilian population are essential parts of the infrastructure and require special attention and protection. While they may have no intrinsic military value at the tactical level, their protection or defence may contribute to regional or domestic support for the NATO mission. The urban infrastructure can thus be seen as the link between the physical terrain and the civilian population but without inadvertently making them into a legitimate military target by physically occupying the site(s).

Civilian infrastructure, in most cases, is not designed with sufficient redundancy to withstand extensive deliberate or incidental damage or disruption.

1.15. The inconsistent structure may create dead zones and make it difficult to keep an extensive and coherent overview.

[3] An inland or delta area comprising both land and water, characterized by water lines of communication, including major rivers and tributaries or an extensive network of minor waterways, canals, and irrigation ditches. (AJP-3.2)

[4] An audience defined *as a party acknowledged as potentially hostile and against which the legal use of force may be envisaged* (NATOTerm), while enemy is defined *as a party whose actions are hostile and against which the legal use of force is authorized* (NATOTerm).

1.16. The following categories of infrastructure are most relevant:

a. **Emergency services**

(1) Emergency facilities such as fire and rescue services, civil defence services and facilities.

(2) Police facilities and prisons.

b. **Government**

(1) Governmental buildings.

(2) Buildings and facilities of non-governmental organizations (NGO).

c. **Communication**

(1) Information facilities such as tele communication, media, broadcast, post.

(2) Public gathering places.

d. **Health**

(1) Emergency hospitals, health care centres and other medical and health services.

(2) Recreational facilities such as sports centres, stadiums and parks.

e. **Water and waste**

(1) Potable water – sources, purification plants, desalination plants, pumping stations inter-connecting pipes, sewerage and treatment facilities.

(2) Waste – The collection, transportation and recycling or disposal of the waste generated by the urban civilian population and the industry.

f. **Energy**

(1) Electrical power – generation (fired by natural gas, oil, coal or, most sensitive, nuclear energy) and infrastructure to distribute electrical power.

(2) Natural gas – The storage and distribution of gas used for heating and cooking.

g. **Finance and commerce**

Business and financial centres, including shops, restaurants, hotels, markets, banks, trading and business centres.

h. **Food**

Outlying industrial, mineral and agricultural centres, including food processing, storage and distribution centres, manufacturing plants, mines and mills.

i. Transportation and distribution

(1) Road networks within and leading to the UE.

(2) Rail networks.

(3) All forms of public transportation within the UE, including both surface and subterranean means.

(4) Airports.

(5) Seaports.

(6) Inland waterways.

j. **Chemicals**

(1) Chemical, biological and toxic industrial materials (TIM) facilities.

(2) Petroleum facilities.

k. **Civil nuclear**

Nuclear sites, nuclear waste sites.

l. **Defence**

(1) Military facilities.

(2) Armaments industries.

m. **Space**

Space associated infrastructure.

n. **Religious and cultural facilities and objects**[5].

(1) Religious places of worship and shrines.

(2) Schools and universities.

(3) Museums and archaeological sites.

1.17. The military use of infrastructure may be in conflict with simultaneous civilian use[6]. All participants in a conflict will try to make the best use of infrastructure to be successful. Under the LOAC only those buildings and objects which by their nature, location, purpose, or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offer a definite military advantage, may be targeted. Furthermore, certain types of buildings, particularly hospitals, religious sites and sites of significance for the protection of cultural property, when such buildings or sites are not used for military purposes, have a specific protected status under the LOAC meaning that they shall not be targeted. If in doubt about the status of infrastructure, it shall be considered to be protected. Additionally, rules of engagement (ROE) may contain further limitations on targeting

[5] See Annex B for the identification through markings.

[6] Dual-use entities can be used for both civilian and military purposes, provide services to civilians and the military, or be civilian-crewed and operated. Examples of dual-use entities that may be dual-use depending on the circumstances include satellites, bridges, electrical systems, fuel, communication nodes, cyber infrastructure etc. An object used for both military and civilian purposes is a military objective provided that the use for military purpose fulfils the definition of military objective. However, if there is doubt whether an object normally dedicated to civilian purposes is contributing to military action, the presumption is that it is not.

buildings and objects. Commanders should pay special attention to identifying critical infrastructure and preventing destruction. Additional consideration should be given to having appropriate capacity and specific capabilities to restore functionality of critical infrastructure in a timely manner and to protect cultural property.

1.18. Qualified personnel, to include utility managers and city planners, are critical to allow critical infrastructure to function.

Visibility

1.19. While visibility along major roads and riverbanks can be excellent, providing unimpeded long-range observation and fields of fire, multi-storey buildings can completely mask large areas of ground from even the highest observation posts. This provides excellent opportunities to infiltrate and outflank defensive positions. Mutual support between sub-units may be challenging. Limited visibility can make orientation, navigation - particularly if only equipped with standard scale mapping - and the identification of friendly forces more difficult.

1.20. Urban terrain can, however, provide excellent cover from ground and aerial observation, especially when supplemented with improvised camouflage using local resources and the skilled use of shadow cast by buildings. However, cover and concealment can be mitigated in larger urban areas that have buildings over five stories tall as observers can look down or engage from greater heights. Careful positioning can provide protection from aerial thermal detection. Urban terrain makes it more difficult to locate the enemy, estimate strengths, dispositions and intentions, or to fix them. The UE therefore provides excellent opportunities to surprise, but also presents the threat of being surprised by the enemy.

Weather and climate

1.21. UEs can be seen as a mixture of structures and mobility corridors, that if not served by civilian utilities and services, can be affected dramatically by the weather. Some weather effects are of the utmost relevance and will affect tactical considerations. These are:

a. Rain or melting snow can flood the subterranean systems. This is especially true when automatic pumping facilities that normally handle rising water levels are deprived of power. Rain can also make storm drains and other sewer systems hazardous or impassable. Chemical agents washed into underground systems by precipitation cause these systems to contain agent concentrations much higher than surface areas. These effects become more pronounced as agents are absorbed by brick or unsealed concrete sewer walls. Snow and ice can also influence mobility.

b. Many major cities are located along canals, rivers or shorelines, which often creates a potential for fog in the low-lying areas. Industrial and transportation areas are the most affected by fog due to their proximity to waterways. Operations in riverine areas must be based on

hydrographic analysis, as some rivers close to the sea are affected by ocean tides, thus increasing depth or at certain times of day being extremely shallow or absent of water altogether.

c. Air inversion layers are common over cities, especially cities located in low-lying “bowls” or in river valleys. Inversion layers’ trap dust, chemical agents, and other pollutants, reducing visibility, and often creating a greenhouse effect, which causes a rise in ground and air temperature.

d. The heating of buildings during the winter and the reflection and radiation of summer heat make UEs warmer than surrounding open areas during both summer and winter. This difference can be as great as 10 to 20 degrees centigrade.

e. Wind chill is not as pronounced in UEs. However, the configuration of streets, especially in closed-orderly block and high-rise areas, can cause wind canalization. This increases the effects of the wind on streets that run parallel to the wind direction, while cross-streets remain relatively well protected.

f. Light levels in the UE will fluctuate. Commanders at all levels should consider the operational constraints associated with both natural and man-made light.

Conclusions for operations

1.22. The typical features of the physical system provide specific advantages, disadvantages and risks for operations in UEs:

- Three-dimensional aspect to operations, at street level, on rooftops and in buildings, and underground in sewers and subway systems. This will complicate command and control and slow the tempo of operations.
- Restricted fields of fire and observation will limit the employment of weapons at their maximum effective ranges, limit reconnaissance, degrade situation awareness and complicate command and control. Density of the terrain will limit radio communications thus further frustrating command and control.
- Infrastructure, in particular when damaged or destroyed, provides cover and concealment for both sides. This will increase options for surprise, counter-attacks, infiltration, bypass and continuous disruption to any movement.
- Canalizing streets, regular patterns and damage to infrastructure may channel, limit and delay movement. Shifting resources from one part to another also proves difficult.
- Increased demand for personnel due to the interaction with the local population, the high casualty rates and density of the terrain. There will be higher casualty rates and higher rates of consumption of ammunition and other combat supplies. Thus, sustainment and casualty replacement must be carefully considered in planning.

- Restricted vehicle movement and requirement for intimate support for all vehicles by dismounted troops due to close engagement ranges.
- Weather and the results of combat in UE, like rubble, dust etc. increase the restrictions.
- There will be additional physical and psychological strain on the personnel. This will demand a greater requirement for high levels of initiative and quality leadership.
- Riverine and littoral areas may offer potential lines of communication and points of entry for own or adversary forces as well as for the civilian population.

SECTION III – THE INFORMATION SYSTEM

General

1.23. Information is plentiful and easily accessed in an UE. Beyond the developing public affairs, government and commercial sectors continue to develop information and communication technologies to provide government services, transport and traffic management, health care, postal, banking, shopping and delivery services and electrical power, water supply and waste disposal utilities. These technologies are used to enable governments and businesses to engage more effectively and actively with the population, enhance the quality of services, reduce resource consumption and therefore costs.

1.24. The continuous accelerating technological development and unfettered access, especially in communications, has increased connectivity within and between cities. This enables the rapid exchange of ideas, data, techniques, and the coordination of activities (e.g. flash mobs and protests). Increased technology and human connectedness broaden the city's networks beyond its physical boundaries, linking it to populations throughout the world. Like other systems, the information system[7] is fluid and is interlinked with the physical infrastructure and is influenced by human interaction within (and external to) the UE.

1.25. The information system within a city can support or counter military operations as well. The city's connectedness provides the means to 'get the word out' quickly to millions of people with minimal effort and almost instantly - with the ability of those people to share the thought/idea with others rapidly. While this can be exploited by military forces, it can also work against them. Without consistent messaging and a free flow of information, it is easy for people to misunderstand military intentions/actions and cause greater unrest within the urban system. Winning the battle of the narrative through effective information activities is therefore paramount.

[7] Describing the interaction within the information environment.

Communication and information

1.26. Many of the information and economic subsystems under political, military, economic, social, information and infrastructure (PMESII) may also be considered integral parts of the urban infrastructure. Examples include:

- the telephone network serving both static and mobile communication;
- the postal and courier system;
- mass communication and media systems consisting of broadcasted and printed media;
- internet service;
- police, fire, ambulance and rescue communication systems;
- the logistical distribution systems for goods including the accessibility of food and other essential services;
- the banking system;
- public/governmental monitoring systems.

Cyberspace

1.27. The interdependent network of digital technology infrastructures continues to evolve and has become a fundamental part of modern life. Elements of the network include platforms, the internet, telecommunications networks, computer systems, and embedded processors and controllers. Even critical national infrastructure (CNI) has become dependent on it. While this has many benefits to the civilian population, it also provides opportunities that can be exploited particularly during operations in an UE. For example, the ability to hack into CNI control systems to turn off the electrical power supply could be as powerful as the threat of or actual use of military force.

Media

1.28. The internet, satellite communications and digital data transmissions, coupled with twenty-four-hour media, mean that journalists report events live or in near real time from the ground. Many journalists, accredited and unaccredited are becoming skilled at operating in close proximity to urban areas where the operations take place. Media representatives often work closely together with the civilian population and therefore have a tangible link to the affected civilian population.

1.29. Media presence should always be expected in the UE where land forces will operate. Every level of command and every single soldier has to be aware of the implications of operating in the UE within a multi-media environment.

1.30. Because journalists are often immersed in a region for months and years, they can be experts in the causes of the conflict and useful sources of information. Newspapers, radio, and television stations will service the

needs of different audiences[8] and can promote a particular view or narrative sympathetic to their target or sponsor.

1.31. In addition to journalists, exploiting information and communication technologies to provide live or near real time broadcasts, smart phones enable any owner to upload reports, images and video to the internet. Although their sponsors' interests may compromise the impartiality of some media, the content uploaded by individual citizens is wholly unverified or uncorroborated. Indeed, adversaries are likely to upload information and images purporting to be ordinary people to contest NATO's narrative to maintain or change the understanding and behaviour of local and global audiences in their favour.

1.32. Social media has exploded in most cities and towns with the advent of smart phones and other hand-held internet devices. These can be used by actors in an UE to plan activities, mobilise and organise supporters, provide situational awareness (SA) and generate support from sympathisers.

Word of mouth

1.33. Due to their close proximity to each other, urban populations often pass information by word of mouth. Information purporting to be factual is often taken at face value and perceptions can be easily created where the originators of information are considered credible. Whispering campaigns can be used in this way to shape perceptions and attitudes very quickly in an urban community. The danger for intervening land forces is that they are insufficiently connected to the local population to know or understand what is being said or believed.

Conclusions for operations

1.34. The complex information system paired with the dense presence of people of all kinds

- confronts commanders and their staffs with a dynamic situation in the information environment;
- provides audiences, in particular actors, adversaries and enemies with possibilities to influence and coordinate actions, but also provides a source of intelligence to seek out influencers;
- provides commanders with the possibility to interact and communicate with large audiences situated in one geographical location, in order to build support for operations.

[8] Individual, group, or entity whose perception and interpretation of events and subsequent beliefs and behaviour may contribute to achieving the end state. See AJP-3.2 – *Allied Joint Doctrine for Land Operations* for more detail.

SECTION IV – THE HUMAN SYSTEM

General

1.35. The human system[9] can be defined as the social, political and economic environment and belief systems that shape the interaction between different sections of the civilian population. Culture, religion, literature, language, music, legend and myth are shared concepts that guide what people believe, how they behave, and how behaviour is interpreted or misunderstood by different groups including NATO forces. The human system includes values, norms, and beliefs influenced by historical and recent events. These shape institutions and how their legitimate and illegitimate power may be exercised.

1.36. The urban human system consists of the characteristics and interactions of individuals, groups and populations linked to the UE. It includes people and their jobs, leisure, business transactions, and study, and learning opportunities. This system is not static as it accounts for population flows into, within, and out of the city. These are complex relationships. In addition to the physical movement of people, they include supply chains, information and internet access to name a few.

1.37. The human system of a city is not confined to its physical location but includes external populations connected to the city (physically and virtually), such as those in peripheral and transitional areas. In addition, diaspora populations located in multiple countries worldwide are part of this system by remitting money to, communicating regularly and spreading ideas with, and engaging in business with the population of their home city, or they might be carrying out political or even criminal activities related to the city. Similarly, events within a city can influence its diasporas and, by extension, influence the countries where these diasporas are located.

National and local government.

1.38. Host nation (HN) and indigenous leaders will seek to function and exercise authority within an UE before during and after military operations. These systems are populated by actors who can be allied, neutral, or opposed to NATO. Their aims will often be focussed on sustaining their sources of power (including legitimate and illegitimate revenue generation) as well as promoting the aims of those they lead. Their allegiances are unlikely to be fixed and may easily change as a result of activities by NATO forces. Understanding these and the actions required to maintain or change their understanding and behaviour is derived from analysis of the society and achieved through the application of joint action. The primary groups are political, religious, tribal or clan, ethnic, and economic.

[9] An element of the human environment.

Administration and services.

1.39. The human system meets some of the needs of local populations by providing services that enable society to function and people to live in relative peace. Their continued operation can assist NATO in establishing and maintaining law and order as well as the consent of local actors through the delivery of essential services. They are:

- government services that include embassies and diplomatic organisations;
- food, shelter, medical and educational services;
- police, fire and rescue emergency services;
- the security and judicial systems;
- water supply, sewerage and treatment services;
- waste collection and processing services;
- welfare and social services.

Civilian society

1.40. Civilian society is a mostly a non-coherent body that consists of many different smaller entities. The civilian populations in towns and cities tend to be more diverse than rural areas.

1.41. Evacuation of the civilian population from the combat areas, even if only partially, will be difficult and extensive and will most likely exceed the commanders' capabilities. Additionally, no matter how great the personal risk, part of the civilian population may resist evacuation in order to remain with their homes. Consequently, operations in an UE will most likely be conducted amongst the civilian population.

1.42. The civilian population in an UE is a significant factor in characterizing the resulting OE. Like physical terrain, it is subject to stratification by a number of factors. Stratification can be by levels of wealth, or differentiation by such factors as ethnic identification, language, age, gender, religion, familial relationships or political affiliation. Even when reasonably homogenous and apparently unified under normal conditions, in times of unrest – especially involving a loss of confidence in government – the civilian population will tend to fracture along self-identification lines.

1.43. In the absence of a recognized, legitimate local government, the civilian population may seek leadership from non-governmental institutions such as religious leaders, tribal chiefs, disenfranchised or banned political figures, labour organizers, or criminal factions seeking political power. Individuals and groups may alternate between cooperating with or competing with one another. Depending on their own interests, they may influence the passive elements of the civilian population to support or defy the conduct of operations.

1.44. All changes create dynamic forces on a civilian population causing what should be recognizable trends in-group behaviour. Change whether positive or negative is unlikely to be perceived as affecting all segments of the civilian population favourably. For example, the delivery of food to starving people by NGOs can be perceived as a threat to the ruling warlords who may use food both as a means of controlling the civilian population and as a source of revenue.

1.45. Regardless of intent, the sheer size of a civilian population can impede movement and pose overwhelming demands on government or military services.

1.46. Social unrest typically leads to the dislocation of civilian populations, resulting in internally displaced persons, refugees and evacuees who can pose overwhelming burdens on urban services and threaten the well-being and security of long term residents and large-scale disruption of public order.

1.47. Commanders have to identify key influences and events that could affect stability in order to understand and control legitimate movement within a civilian population as well as to separate foreign and disruptive elements from the civilian population. Each situational assessment must be based on extensive knowledge of local, social and cultural norms. Use of HN personnel will ease the burden of identifying key influential personnel and better understanding of varying cultural differences.

1.48. The struggle to gain the people's support is of pivotal significance for the success in operations in UEs. Therefore, civilians must be at the centre of the commander's considerations at the early planning stage, including, most importantly, measures for the protection of civilians and their property.

1.49. The support of the local civilian population is considered one of the most important factors in military operations. Therefore, trained civil-military-cooperation (CIMIC) personnel and stability policing (SP) capabilities along with governmental organizations (GO) and NGOs are required to make military effects understandable and acceptable to the local populace. Commanders must allow and facilitate the rapid and unimpeded passage of humanitarian relief for civilians in need, while still maintaining control over the movement people and goods in and out of their AOR.

Conclusions for operations

1.50. The presence of a civilian population

- requires its protection in accordance with the LOAC and/or human rights law as applicable;
- requires every effort to distinguish between combatants and civilians;
- makes it an actor or audience for information activities for both own forces and the adversary;
- requires continuous interaction due to ever changing dynamics.

SECTION V – THREATS

Threat characteristics

1.51. An UE offers adversaries or enemies an opportunity to exploit their superior knowledge of the terrain and to counter the current technological and training advantages that many western armies enjoy. They will try to target the population's national will by inflicting an unacceptable level of casualties to undermine public support for NATO as well as undermining the will and cohesion of the force. Furthermore, for relatively ill-equipped groups who are attempting to make a political statement, the connectivity offered by the UE gives them access to a worldwide audience, putting propaganda at the very centre of operations. They are then not dependent on tactical success and will very often try to avoid decisive engagement. It is thus highly likely that adversaries or enemies will do all they can to draw NATO into towns and cities.

1.52. Enemies may be either regular state sponsored forces or irregular entities. Both may use conventional or unconventional methods.[10] Unconventional methods may include irregular activities, which are defined as *the use or threat of force by irregular forces, groups or individuals, frequently ideologically or criminally motivated, to effect or prevent change as a challenge to governance and authority*[11]. Those activities may be applied by insurgents, criminal-networks or groups organizing riots.

1.53. In an UE different enemies and groups using unconventional methods may very likely operate in parallel, independent of each other with different objectives, while still coordinating their activities to some degree.

1.54. Beyond conventional warfare NATO will most likely be challenged by asymmetric[12] or even hybrid threats[13]. Examples of asymmetric threats include terrorist attacks, criminal activity, guerrilla warfare and environmental attacks.

1.55. Operations in an UE will be conducted amongst the civilian population, which can make it difficult to distinguish between civilians and the enemy. Enemies may not be wearing uniforms and therefore, may easily blend into the civilian population. Pattern of life analysis, consistent civilian and threat assessments, and the observation of behaviours may help to

[10] Conventional methods are more commonly used or recognized. These are associated with predictability, and NATO can generally pre-plan protective and preventive actions against threats emanating from activities executed through conventional methods.
Unconventional methods are methods not commonly used, not easily recognized or possibly detected. They are associated with unpredictability. NATO may find it challenging to pre-plan and organize protective and preventive action against threats emanating from activities executed through unconventional methods. (See AJP-01 *Allied Joint Doctrine* for more detail)

[11] NATOTerm.

[12] Asymmetric threat is defined as *a threat emanating from the potential use of dissimilar means or methods to circumvent or negate an opponent's strengths while exploiting his weaknesses to obtain a disproportionate result* (NATOTerm).

[13] Hybrid threat is defined as *a type of threat that combines conventional, irregular and asymmetric activities in time and space* (NATOTerm).

distinguish between civilians and the enemy. The use of human shields is illegal under the LOAC but will not preclude the enemy from being legally targeted, provided that there is adherence to the LOAC principle of proportionality and its prohibition of excessive collateral damage. In operations below the threshold of armed conflict the peacetime rules on proportionality apply, which do not allow collateral damage. Thus, it is even more difficult to deal with enemies employing human shields.

1.56. Enemies may use the existing urban infrastructure, such as hospitals, schools, churches, banks and government buildings, because some are considered neutral sites or critical infrastructure that discourage friendly forces from attacking them.

1.57. Irregular enemies will not rely on traditional, established logistics networks, but they will use the city's sustainment systems to supply their forces and use caches to pre-stage materiel within the city itself. Some enemies may also attempt to co-opt or coerce civilians to support their sustainment/logistic needs.

1.58. The UE presents an ideal environment for the employment of low cost but effective obstacles and threats such as burning tyres, mines and improvised weapons, such as improvised explosive devices (IED), booby traps and off-the-shelf unmanned aircraft systems (UAS). The IED threat assessment crosses all levels of potential conflict, from warfighting to stability and peace support. Assessments need to be comprehensive and continuously updated so that appropriate countering-IED (C-IED) capabilities and measures can be implemented. IEDs can be used in both an offensive and defensive manner, in multiple phased attacks and in conjunction with secondary devices as well as in deception scenarios. Generally, it is vital for all levels of command to identify and assess the IED threat situation as timely as possible, protect forces and understand and attack the IED network[14].

An IED is a device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic or incendiary chemicals and designed to destroy, incapacitate, harass or distract. IEDs and other explosive ordnance (EO) have to be handled only by specially qualified personnel (e.g. EOD/IEDD teams). Similar procedures are to be used by handling unexploded explosive ordnance (UXO).

1.59. Littorals and riverine areas in an UE may be exploited by enemies as a means of manoeuvre, reinforcement, or resupply, and thus can impose a risk for the land force if not taken into consideration.

1.60. In order to deny NATO's objectives adversaries will use different means and ways to achieve several key effects:

[14] See AJP-3.15 – *Allied Joint Doctrine for Countering Improvised Explosives Devices* for detail.

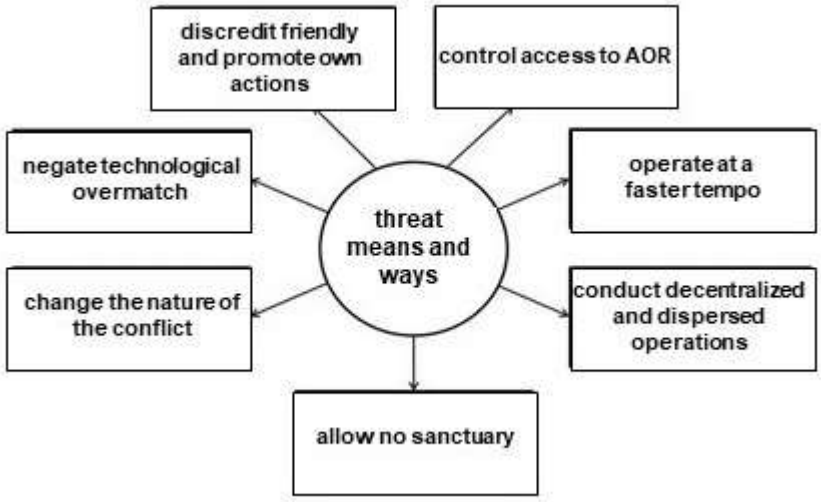


Figure 1-2: Key threat means and ways

1.61. To identify, counter or pre-empt threat efforts is challenging in an UE, due to the high costs in time, materiel and manpower. The limited effects of some technological advantages, legal and moral issues created by exposing numerous civilians to harm or injury, and the ability of the media to observe and report the adversary's version of events are also threat challenges. Commanders must adopt innovative methods to counter asymmetric threats. They must have a particular focus on the adversary's attempts to discredit friendly actions, increase the public support for his cause and even break public support in the troop contributing nations. The battle for the narrative becomes paramount.

1.62. Although some enemies may refuse to comply with the LOAC and/or other applicable law, this must not affect NATO forces adherence to it and their need to act legally at all times.

1.63. Criminality can be driven by factors including poverty, inequality, political transitions, and poor urban planning and design. All of these issues may be exacerbated in the aftermath of combat operations, especially if the existing domestic police force is ineffective or non-existent. In this situation, military personnel with police-like skills will in cooperation with local authorities play a crucial role in identifying and locating criminal actors. Success will depend on understanding the causes of criminality and how they can best be prevented or contained.

Urban hazards

1.64. Inherent to an UE are hazards caused by the specific features. Those hazards could, whether they are caused by military action or not, hamper operations and impose considerable risks on both military personnel and the civilian population. Those hazards could be imposed by questionable construction standards, specific hazard areas such as fuel stations, industrial sites, and electric or gas lines. Industrial accidents and the breakdown of urban systems (including nuclear power plants), either

through deliberate targeting or collateral damage, pose a significant threat to NATO forces and the civilian population.

1.65. Toxic Industrial Material (TIM) production, storage and research facilities are in particular at least a risk and often a threat in an UE. TIM industry and storage facilities are often located in the direct vicinity of seaports and airports of debarkation. Industrial chemical and related environmental hazards can cause tactical, operational and strategic implications. Hazardous substances may be released intentionally or unintentionally. Damage to infrastructure may lead to unforeseen consequences by creating the conditions for disease to affect not only the operating force but also for the indigenous civilian population. Qualified chemical, biological, radiological and nuclear (CBRN) personnel must clarify possible threats emanating from industrial infrastructure such as chemical and agricultural operations and from academic institutions at an early stage of the operation.

1.66. The UE causes CBRN hazards to react in very unique ways, which offer many advantageous targets to the enemy. UEs may cause CBRN hazards to wash into low-lying or subterranean spaces, and the concentration of people increase risks associated with infectious diseases and the use of biological toxins. Enemies are likely to target places and facilities with a high density of people (e.g. public transport, military camps) as targets for the use of CBRN weapons and civilian facilities may be used for the production of CBRN. Ports should be monitored to combat weapons of mass destruction (WMD) proliferation.

CHAPTER 2 – FUNDAMENTALS FOR OPERATIONS IN URBAN ENVIRONMENTS

SECTION I – THE RELEVANCE OF OPERATIONS IN URBAN ENVIRONMENTS

2.1. Towns and cities are the centres of leadership, administration, economic power and culture and therefore are symbolically and psychologically important to the civilian population. Cities are significant drivers of development and economic activity and centres of strategic, political and symbolic power with great influence outside their geographical space. Urban settlements have always represented centres of civilization and major assets for their countries, regions and, in some cases even the entire globe. Cities are becoming increasingly prime targets of military and insurgent attacks to exploit the connectivity of UEs to broadcast political statements to a global audience.

2.2. Precisely because operations in UEs remain complex, challenging, and difficult to sustain and win, cities are also the most likely environment for a serious enemy to challenge NATO. It is not a matter of “if” but “when” NATO will be involved in operations in an UE across the spectrum of conflict from humanitarian to stabilization missions and warfighting operations. The great concentration of urban centres in Europe and North America makes it very likely that, in the case of an attack on a NATO country, NATO forces will find themselves either defending cities in Alliance countries or conducting major offensive operations to expel an enemy.

SECTION II – BASIC PRINCIPLES

2.3. Land operations conducted in an UE follow the general principles of land operations as described in AJP-3.2 – *Allied Joint Doctrine for Land Operations*, ATP-3.2.1 – *Conduct of Land Tactical Operations* and ATP-3.2.1.1 – *Conduct of Land Tactical Activities*. The fundamentals for all types of land operations are described there.

2.4. However, due to the specific character of an UE as described in Chapter 1, some additional specific principles must be taken into account. The physical characteristics of urban areas embody more than terrain. The density of the civilian population, the complexity of the infrastructure, the sheer scale of the city, and the interconnectedness of the physical, information and human systems will drive military considerations regarding the employment of force.

2.5. NATO operations in an UE will follow the following five basic principles:

- maintain continuous understanding of the UE;
- prosecute operations across all urban systems;
- maintain a mind-set of force agility;

- adopt a campaign mentality in terms of the duration of the operation and amount of resources required for its conduct;
- maintain the integrity of the urban system.

Maintain continuous understanding of the UE

2.6. Understanding the flow of information, goods, people, energy, waste, and commerce is essential for the comprehension of how the city functions. These flows are all interdependent, and a disruption of one often interferes with or interrupts others. This complexity and inter-relation of systems lead to multiple consequences of every single action.

2.7. The conduct of operations in an UE will therefore be enabled by the understanding of the urban system, including monitoring and analysing city data feeds, recognizing flows and tempo, and building a shared operational picture among all inter-organizational partners. Understanding the characteristics of an UE requires a holistic way of thinking to comprehend the multi-dimension[15] and multi-domain[16] nature. A force operating in this environment must comprehend all these sub-systems and manage the information to succeed.

2.8. The inter-relationships between the different systems within an UE will lead to frequent and quick changes, presenting new problems and challenges. Understanding must therefore be a continuous process.

2.9. Permanent interaction within the UE is a prerequisite for quick understanding, timely reaction and projection of forces.

2.10. Due to the dense and diverse environment and the consequent dispersed approach to operations, understanding is not just a strategic or operational level requirement. Tactical commanders at all levels must have a thorough understanding of the environment in which they are operating to be able to implement the higher commander's intent in a continuous changing complex environment.

Prosecute operations across all urban systems

2.11. The complex and densely populated nature of the UE with its attendant different urban systems (physical, social, informational) provides multiple opportunities to create effects across the OE at a level, which is impossible in non-urban environments. This confronts NATO commanders with challenges but also with significant opportunities. By creating concurrent effects in all urban systems, across all effects dimensions and supported by effects in other domains a NATO land force can pose multiple, simultaneous dilemmas for the enemy, outpacing their decision, action cycle and attacking their cohesion. While creation of multiple effects across all dimensions and domains will confer a significant advantage in a rural environment, it is critical for successful

[15] NATO recognizes the physical, virtual and cognitive effects dimension.
[16] There are five operational domains: maritime, land, air, space and cyberspace. See AJP-3.2 – *Allied Joint Doctrine for Land Operations* for more detail.

operations within the UE. Should commanders restrict their effects, it is likely that the enemy will exploit the other effects dimensions or domains unchallenged.

2.12. In order to successfully operate this way, commanders will need to orchestrate multiple actions across time targeted at multiple actors ranging from the civilian population to the enemy. Thus, it is likely that an operation in an UE will present itself as a series of smaller operations.

This approach requires broad interaction and planning with indigenous local authorities and other international actors formal and informal leaders and entities, and commercial/economic players in the execution of operations. The best possible level of interaction between military and non-military actors is based on proactive engagement, shared understanding, mutual trust, and a willingness to cooperate. Commanders must be aware that planning and coordination under those conditions takes time.

2.13. The complexity of an UE and consequent multi-faceted operations must not lead to operations without focus. The commander must maintain his path towards the objective and concentrate on the essential elements necessary for achieving that objective.

Maintain a mind-set of force agility

2.14. The UE poses multiple challenges caused by multiple constraints to military operations and the dynamic nature of the environment itself. Therefore, detailed planning needs to be complemented by a high level of agility in order to maintain initiative, react in time, and adapt to the dynamic environment.

2.15. Because conditions in an UE reduce the ability of military forces to operate as a coherent whole and prohibit the employment of traditional formations, units will be forced to disperse into multiple smaller elements more so than in a traditional battlespace. These small, distributed units need to be highly adaptable and ready to aggregate if mass is required.

2.16. Force elements must be capable of quick regrouping and re-establishment of command relationships between or even during phases of an operation, taking into account certain limitations such as those associated with movement and communication. This implies the need for interoperability, communication, and rehearsals at levels lower than usual, and it requires a correspondingly high level of networking across organizational units.

2.17. To do this, the level on which combined arms principles need to be implemented will be much lower than normally accepted and understood. Command and control (C2) must be organized in a way to increase the speed of decision-making, adaptation and coordination.

2.18. Agility requires organizational preparedness, flexible task organizations and sustainment, and the mental preparedness to rapidly adapt plans, to assign capabilities and delegated authority to the lowest levels and to

extensively use mission command. However, commanders need to careful to not overstretch the span of control for subordinates.

2.19. Force agility includes the capability to locally increase or reduce the intensity of the operation according to the demands of the prevalent situation.

Adopt a campaign mentality

2.20. The physical terrain in the UE increases the natural superiority of the force familiar with the battlespace. The UE features make operations more difficult, costlier, and time consuming. As adversaries will exploit the characteristics of an UE, NATO forces will not be in a position to defeat the enemy in a single action. The enemy will use all possibilities to avoid defeat while keeping NATO forces constantly committed.

2.21. Seizure and control of a specific UE area will not lead to the enemy's collapse. Control of the complex system of an UE needs a sequence of coordinated actions, maintained over a prolonged period to be effective.

2.22. The limitations and specific conditions of military operations in UEs and the complexity of military operations restrict NATO forces' ability to bring technical advantages and higher force ratios to bear. Adversaries will use the UE to increase their combat effectiveness through support by civilians and militarization of commercial off-the-shelf technology. This ability and tactical and technical adaptation in the face of superior resources are significant factors in their ability to sustain the fight.

2.23. Time-consuming operations require the sustained provision of resources. Sustainment of friendly forces, movement in and out of the UE, the size of the force, and the maintenance of the necessary staging areas are operational factors that the UE exacerbates. Even single actions to be conducted within the dense UEs require comparably high levels of resources[17].

2.24. The prolonged duration of operations in an UE allows for the development and refinement of techniques and procedures through experience. This is especially true for asymmetrically operating irregular opponents. Commanders must be prepared to adapt their own approach to operations accordingly.

2.25. The appropriate approach towards the desired end state is most likely not a quick decisive action but an effort by small but constant steps. As a consequence, commanders conducting operations in an UE need endurance and patience. Planning and conduct of an operation need to be economized in order to avoid premature culmination.

Maintain the integrity of the urban system

2.26. Commanders must plan for a civilian presence, which in turn, increases the potential for civilian casualties and imposes the requirement to plan

[17] US experiences call for three to five time more resources than in comparable operations in rural areas.

for the protection of civilians and minimize harm in line with NATO Policy for the Protection of Civilians[18], the LOAC and/or applicable human rights law.

2.27. As cities are built to operate in peace, the complexity and density of the UE makes it very vulnerable to any effects of violence. A breakdown of sanitation and health systems can lead to large-scale health crises. Any damage to one small part of the system, such as a critical infrastructure node, could have an impact on a much larger area of the city, and implicitly on the larger population. Every bit of damage could have negative consequences, which may endure far beyond the timescale of the operation. As a consequence the UE may not only have to be re-build, but commanders also may have to deal with unintended second and third order effects, for instance internally displaced persons, refugees and evacuees.

2.28. The survival of the civilian population and the availability of basic services, however, is dependent on the functioning of the urban systems. Beyond being the living area of a considerable number of people, cities are centres of leadership, administration, economic power, and culture and therefore have symbolic importance and political relevance.

2.29. Land operations are always embedded in NATO's support to a comprehensive approach[19] of international crisis management. The strategic end state will most likely imply the maintenance or re-establishment of functioning governmental systems and basic services. This implied strategic objective will both guide and limit all tactical actions. Short-term tactical success must always be weighed against the required consequence management to maintain the functionality of the urban system.

2.30. This basic principle does not only call for minimizing harm, but for maintaining or, when required, re-establishing basic services providing for the survival of the civilian population. NATO forces may therefore be forced to assume responsibility for specific systems, services, and infrastructure within the city, or provide a safe and secure environment, law and order, aid and relief to the citizens of a city until their critical infrastructure can be re-established.

2.31. Consequence management, defined as *actions taken to maintain or restore essential services and to lessen the effects of natural or man-made disasters*[20] includes measures, tasks, and activities taken to mitigate the damage, loss, hardship and suffering. It includes measures to restore essential services, protect public health and safety, and provide emergency relief to affected civilian populations. Commanders should develop consequence management plans for predictable scenarios prior to engaging in an UE.

[18] www.nato.int/cps/en/natohq/official_texts_133945.htm
[19] See AJP-3.2 – *Allied Joint Doctrine for Land Operations* and ATP-3.2.1 – *Conduct of Land Tactical Operations* for more detail.
[20] NATOTerm.

2.32. In planning, military engineering (MILENG) staff will play a crucial role in locating, identifying, and continuously assessing critical civilian infrastructure that provides essential services to the civilian population, and which should be protected.

2.33. A prerequisite for termination of operations in UEs and the re-deployment of the land forces is the transition to another capable authority, which can assume responsibility, provide security, and essential services to the civilian population.

CHAPTER 3 – IMPLICATIONS ON ORCHESTRATING OPERATIONS IN URBAN ENVIRONMENTS

SECTION I – JOINT FUNCTIONS IN URBAN ENVIRONMENTS

General

3.1. The joint functions as described in AJP-3 – *Allied Joint Operations* and AJP-3.2 – *Allied Joint Doctrine for Land Operations* and specified for land operations in ATP-3.2.1 – *Conduct of Land Tactical Operations* are an analytical tool for commanders and staff in all kinds of land operations. They provide a complete description of all the functions that military organisations do in planning, conducting and consolidating operations.

3.2. The role of the joint functions and their implications for planning and conduct of operations applies for operations in an UE as well. However, in an UE, the constituent parts of the system are so tightly interconnected that the natural overlap of the joint functions may become even more blurred. Additionally, an UE will provide some supplementary specific implications regarding the joint functions, as described below.

Command and control (C2)

3.3. An UE will challenge centralized decision-making. The need to coordinate, de-conflict, and sequence roles, missions, and activities will stretch C2 processes, staffs, and systems, possibly beyond their maximum capacity, due to the density and quantity of information desired. Maintaining appropriate SA requires the use of a network approach.

3.4. To overcome specific challenges commanders must find a good balance between giving subordinates sufficient freedom and putting the necessary control measures in place. This approach will synchronize effective operations in UEs, and avoid friendly fire incidents and/or collateral damage. The flatter the command organization, the better.

3.5. Commanders must generally **delegate responsibilities** in order to provide subordinates freedom of action in achieving their tasks and exploiting opportunities. A prerequisite is that subordinates know the higher commanders' intent and are fully aware of the restrictions in the UE in terms of protection of the civilian population and the integrity of the urban system.

3.6. This approach needs to be supported by providing subordinates with sufficient time and assets. The task organization must provide the units with sufficient assets to exploit their freedom of action and be able to face unexpected developments without the need to request external specialist support, which may not be as easily reallocated as in the rural environment. This leads inevitably to the requirement to apply **combined arms principles** at levels much lower than usual.

3.7. In an UE centrally organized reinforcements, support and sustainment is often not possible on short notice. To ensure such support, commanders must establish a flexible, often de-centralized layout of supporting capabilities, delegating release authorities as appropriate.

3.8. **Control** needs to be ensured through thorough preparation and dynamic **battlespace management** (BSM)[21]. Multiple elements occupying the same grid coordinate in different vertical levels of space, but reporting to multiple authorities, will present control challenges for BSM. The boundaries of assigned AOR in an UE extend below the ground and cross boundary movements in the subterranean have to follow traditional reporting or handover procedures.

The extensive use of UASs by both friendly units and the adversary will require additional identification measures to avoid friendly fire incidents.

3.9. **Communication.** Ground operations tend to become decentralized. The difficulties of communication that arise from the dispersal of force elements into buildings, underground passages, streets and alleys force C2 to devolve toward the smaller unit level. Combat net radio, high capacity data radio, automated situational reporting systems and global positioning systems can all be degraded by the terrain. Complex systems are prone to failure in urban terrain. Forces operating in subterranean urban spaces may completely lose radio connectivity.

3.10. Mitigation of these effects may be achieved by the following measures:

- carefully position commanders, command posts and antennas to take advantage of urban terrain characteristics;
- establish and protecting tactical satellite dishes and rebroadcast stations on high rise buildings or dominating ground, placing armoured vehicles at nodal points and employing helicopters or other aircraft systems to rebroadcast or relay transmissions;
- use alternative means of communication including messengers (runners), field signals, line and civilian telephone systems;
- make use of liaison detachments, where appropriate also on lower levels;
- be prepared to reconnect to combat net radio networks when emerging from buildings, tunnels or dead spots, and optimize short range personal radios and word of mouth to maintain SA within the sub-unit or platoon;
- maintain the ability to switch to analogue or non-electronic means of battle monitoring and planning within headquarters;
- use spot maps, which are quicker to use than grid references, to relay friendly and adversary locations over combat net radio (see Annex B).

[21] See ATP-3.2.1 – *Conduct of Land Tactical Operations* Chapter 4, Section VII.

Intelligence

3.11. Intelligence to support land operations in the UE must consider assessment of all three systems in the environment and the manner in which they interact and impact upon planned objectives. Intelligence must work to help distinguish threats within this environment. Particularly, intelligence work must identify the objectives and conditions that the adversaries wish to achieve or create. This should directly inform and influence a commander's planning and conduct of operations.

3.12. Land forces planning to operate in an UE should consider how civilian populations and enemy forces interact within each particular part of the UE, what patterns of life are normally applied and what constitutes normal and abnormal behaviours. This will differ across physical, ethnic and commercial boundaries. Understanding these changes will be important for SA across land forces operating in or transiting an UE.

3.13. Specific information requirements in an UE may be:

- what are the critical, mission vital and key infrastructure in the AOR?
- what are the potential vulnerabilities to the infrastructure facilities?
- are there TIM or WMD production, storage and research facilities?
- where are critical national infrastructures (such as cultural, religious, political, or symbolic facilities) located?
- what are the locations of diplomatic embassies and missions in the UE?
- are there endemic or emerging diseases in high-population or surrounding areas?
- what are the local medical capabilities for treatment of conventional warfare and CBRN patients, handling mass casualties and assessing the worried well?
- how do locals (by faction) perceive friendly forces and their efforts in general?
- is the civilian population pro-NATO (or coalition), neutral, or pro-adversary?
- what are the existing networks?
- is the adversary indigenous to the UE or from outside the area?

3.14. Friendly application of various effects will be constrained by limited visibility and the ability to locate, classify, and discriminate between threats and civilians rapidly. The limited exposure time to locate, classify, and discriminate between the enemy and civilians as they move from street to street, building to building, and room to room is a major challenge for land forces. This limited exposure, coupled with the mixing of enemy with civilians, also impacts weapon choice, particularly in the case of explosive munitions. Additionally, land forces must be able to

effectively communicate with the local population to exploit local knowledge or to elicit their support or to remain neutral.

3.15. For operations in an UE some special sources are available. Data on the layout, structure, and organization of the majority of urban areas in the world will often be readily available through open source as well as military means. In addition to imagery from military satellite and air reconnaissance, commercial mapping and satellite imagery may be more immediately available, although possibly less accurate due to the age of the image. Geographic information systems, Google Earth and similar 3D visualization tools are used extensively for planning by commercial agencies. Communication, power, and transport networks as well as town plans can be accessed from government agencies, utility companies and often directly off the worldwide web. Data on the social and information system of the UE may be provided by the HN or may be collected through regional TV and broadcast stations. Due to the role of the information system in an UE, monitoring of social media is of paramount importance. Passive monitoring of social media traffic can offer insights into the intentions, opinions, and expectations of other actors and audiences connected with the UE.

3.16. Operating with local forces offers several advantages, particularly in urban terrain where engagement with the local populace will be frequent. Their SA and ability to spot the abnormal will be useful as will be their ability to communicate in the native language. Their presence may assist a narrative or help gain local consent. These circumstances can mean that the tempo of the land force is enhanced and its ability to spot and exploit newly acquired intelligence is significantly greater than if it operated alone. Local forces add legitimacy to the operation and should therefore be included in targeting, reactive, or pre-emptive operations aimed at disrupting or neutralising an enemy.

3.17. Infrastructure and other components of essential services are usually interconnected and interdependent. Therefore, a proportionality assessment prior to using force in urban settings must specifically include not only the impact of death, injury and destruction of infrastructure in the weapon’s impact zone, but also indirect affecting the provision of essential services to the civilian population well beyond the impact zone. For example, direct or indirect arms engagements may result in residential building fires that not only pose risks to civilians and destroy homes, but secondary effects that create added problems of newly displaced persons who require housing, food, health care, protection, and jobs.

3.18. Route and terrain reconnaissance must be emphasized due to the existence of multiple obstacles, the reinforcement of natural terrain features, and the three-dimensional UE (subterranean, surface, super-surface) which requires an increased level of support owing to the three-dimensional nature of the environment.

Manoeuvre

General

3.19. Manoeuvre in an UE is characterized by complex terrain, smaller units, and more options for movement, as well as by the canalizing effect of infrastructure and destruction. Bold manoeuvre may be risky, because SA may be incomplete due to the complex environment and continuously changing conditions. Forces may need frequent halts to keep the lines linear thus restoring contact among each other.

3.20. The cluttered confinement of streets and buildings in built up areas precludes the traditional deployment and manoeuvre of battalions and brigades and demands more decentralised command. Manoeuvre by dispersed units requires more independence of the force and additional coordination. This includes appropriate control measures, frequent liaison and communication between units and their headquarters staffs as well as frequent location reports relayed to sub-unit leaders.

3.21. Manoeuvre can exploit cover, concealment, direct fires, or even indirect fire from multi-storey buildings.

3.22. Manoeuvre on the ground includes manoeuvre from building to building, between buildings and within buildings as well as the exploitation of the super surface and the subterranean. This complex way of operating requires the creation of appropriate identification friend from foe procedures, and well-known and standardized visual signals or diagrams placed on buildings to indicate the status of a building (see Annex B).

3.23. Land forces should not become over extended or unnecessarily expose flanks by setting limits of advance. Strict limits of exploitation should be imposed.

3.24. Subterranean manoeuvre along tunnels and drains can be used to penetrate, infiltrate, bypass or envelop an enemy who is operating from a static location. However, the capacity of many tunnels means that only small numbers of light forces can move along them at any one time. Therefore, they are less suitable for operations where a rapid concentration of force is required or where the risk of isolation of the manoeuvring forces would be unacceptable. As this option is also equally open to the enemy, entry and exit points to tunnels and drains should always be secured, covered by fire or sealed if they offer no value to friendly operations. If entry and exit points of subterranean facilities are bypassed it has to be reported to the higher headquarters to assist in maintaining a clear common operational picture at all echelons regardless of whether a battle handover is conducted.

3.25. Air manoeuvre or support of ground manoeuvre by aerial platforms can offer several advantages in an UE. However, even an irregular adversary is likely to have access to weapons that can be used for air defence,

some of which may be highly effective. The risk for slow and low flying helicopters has to be carefully weighed against the possible benefits.[22]

3.26. Littorals and riverine areas may restrict manoeuvre space or even constitute considerable obstacles and require a bridge, ford or ferry to cross. On the other hand, they can expand manoeuvre space, if the required capabilities are available. Unlike on land, it is more difficult for the enemy to place effective obstacles into the water. Water therefore may provide opportunities in particular to envelop or bypass the enemy. Control of the littoral and riverine areas ensures friendly freedom of manoeuvre and denies the same to the enemy. Control of waterways includes the control of banks.

Littorals and riverine areas may also provide possibilities for first entry into the UE or for demonstration or feint, drawing the enemy's attention away from the actual break-in point in another location of the urban environment.

Mobility

3.27. Some terrain will enable fast movement along wide metaled roads. However, as it is channelled over, under and around natural features and other infrastructure, such movement can easily be slowed if not halted by blowing bridges, over/under passes or cratering and mining road junctions and covering with direct and indirect fires. Road movement may also be reduced by rubble from buildings demolished by indirect fires or demolition.

Movement through parkland or low-density suburbs, however, may be similar to rural terrain and relatively unconstrained. Conversely, vehicle movement through shantytowns may be totally prevented by the narrowness of their tracks or possible steepness of the road slopes.

3.28. Manoeuvre ground must be secured to prevent adversaries from infiltrating, placing IEDs or mines, and from using that ground to conduct an encirclement or a counter attack. Covering ground visually may be necessary where insufficient forces are available, but vulnerable points such as obvious junctions or bridges on infiltration or withdrawal routes must be held and protected until no longer needed by a manoeuvring force.

3.29. MILENG provides the capabilities to shape the physical OE enabling mobility by clearing (passive and active) obstacles that hamper the freedom of manoeuvre.

3.30. Using explosive materials may enhance the horizontal and vertical mobility in buildings by creating entries and passages through walls, stories and roofs. This has the additional advantage of keeping manoeuvre forces out of the streets that can quickly become killing areas.

3.31. Effects created by fire support could hamper manoeuvre elements, if not coordinated properly.

[22] See ATP-49 *Use of helicopters in land operations*, Chapter 5 for more detail.

3.32. While dismounted infantry lack firepower and protection, given time, they can manoeuvre virtually anywhere. Armour has considerable protection and firepower and is capable of rapid, but armoured vehicles are more subject to canalization and they are more vulnerable to shoulder launched anti-armour weapons in an UE than in a rural environment.

3.33. The primary role of the tank in an UE is to engage adversary armoured fighting vehicles and tanks. The secondary role of the tank is to provide heavy direct fire against buildings and strong points that are identified as targets by the infantry. The wall and fortification breaching effects of the tank gun are important capabilities. Armoured fighting vehicles may be also used for directly breaching of walls and obstacles.

3.34. There are occasions when helicopters' ability to provide precision long range direct fire (e.g. from attack helicopters) can overcome limitations of ground based systems. Helicopters can maintain a greater stand-off range and continuous communication between them and the supported ground forces. However, helicopter manoeuvrability is often limited by buildings, and helicopters face increased hazards, e.g. towers, wires and antenna hazards, as well as increased risks from adversary ground forces, such as tank main guns, antitank guided missiles, small arms, man-portable surface-to-air missiles, as well as interference from enhanced handheld laser pointers.

3.35. Air-mobile manoeuvre insertion methods and associated landing site/zone selections will be challenged by urban canyons that allow the enemy to engage from below, alongside, and even from above. The UE will rarely offer large open areas capable of landing large formations. Instead, it will require the ability to rapidly deploy smaller formations using multiple landing sites/zones.

3.36. It is likely there will be a proliferation of micro- and mini-UAS for both commercial and military use, and these systems may represent a considerable challenge to air/land operations and freedom of manoeuvre in this environment. Countering the enemy's use of low-altitude airspace and their use of small UAS will require creating appropriate control measures to enable friendly freedom of manoeuvre will be critical to success.

Counter-mobility

3.37. Three-dimensional operations (surface, subterranean, super surface) in UEs make counter-mobility a three-dimensional effort, denying the adversary alternative movement possibilities. The canalizing effect of an UE and the existence of rubble and natural obstacles like vehicles must be exploited.

3.38. Shaping the UE is strongly MILENG resource demanding due to the layout of the UE, rubble and the extremely dispersed layout of forces. To ensure the required support for counter-mobility will require MILENG resource coordination and a certain degree of adaptation of all forces in conducting basic MILENG tasks, always under direction of the MILENG staffs/advisors.

Fires

General

3.39. Engagement of targets will vary rapidly from personnel to armoured vehicles to buildings, and other structures. This requires infantry, armour, artillery, and other joint fire support (JFS) means to be able to switch rapidly from one type of target acquisition and munition to another. Operating in combined arms groupings at platoon and company requires those levels of directing fire, if necessary, with their own organic capabilities.

3.40. Operations in an UE connected to littorals and riverine areas may take advantage of firepower provided by amphibious and naval forces.

Target identification

3.41. The dense UE makes it difficult to positively identify and target a threat with capabilities that rely on visual signatures, locations or behaviour to indicate adversaries. Due to terrain-features and poor visibility, targets are fleeting. This very complex OE demands an accurate target acquisition process, which requires a wide range of sensors including intelligence, surveillance, target acquisition and reconnaissance (ISTAR) assets in order to cross check the collected data.

3.42. The urban grid system (see Annex B)[23] is very useful in facilitating fire support. It allows for fast and precise targeting, enables the coordination with other indirect fires or close air support (CAS) and is useful for all reporting and messaging by ground troops.[24]

Limitations for the delivery of fires

3.43. Fires can degrade mobility corridors, destroy city infrastructure, and cause mass civilian casualties, potentially violating the LOAC and jeopardising the success of the mission. The effects may cause destruction that would hinder the movement of friendly forces and cause collateral damage. It may also trigger indirect (‘‘reverberating’’) effects hindering the provision of services essential for the survival of the civilian population. The presence of civilians and legally protected structures as well as toxic and/or industrial sites influence planning and the conduct of fire support. TIM and environmental hazards have to be assessed before target engagement.

3.44. The enemy’s fire position within sensitive urban areas may cause challenges for counterbattery fire, which has to take into account the rule of proportionality under LOAC.

3.45. Well-integrated fires and airspace command and control plans decrease target identification and clearance times, and can create a more rapid,

[23] Also labelled as gridded reference graphic.

[24] It has to be noted, that the grid generated by this urban grid system has to be converted to a UTM grid by fire support specialists in order to process an indirect fire mission.

permissive indirect or counter fire response. Fire support coordination measures play a paramount role.[25]

Deliver fire support

3.46. **Dead space**. This pertains to all direct delivered munitions and is due to urban canyons, building structures, riverbanks and other urban characteristics. Systems such as mortars, with a high trajectory will reduce this effect but will be less accurate, in particular as a result of wind canalization through “urban canyons”.

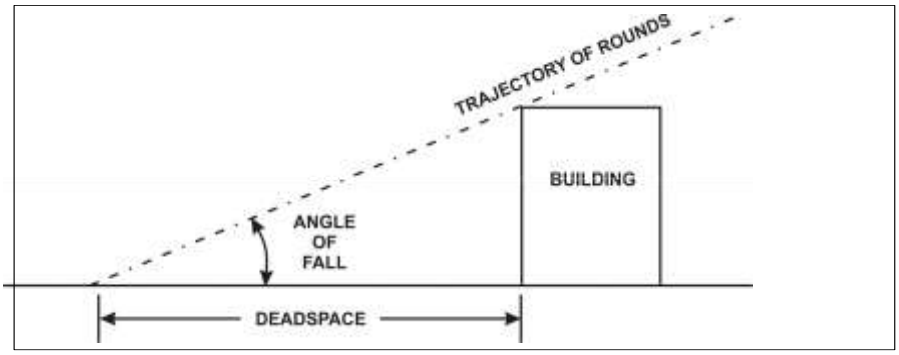


Figure 3-1: Dead space in the UE

3.47. **Danger close fire**[26] in an UE is not the exception, but the rule. The nature of urban infrastructure actually helps mitigate the risk of danger close fire because the houses and structures serve as buffers for weapons effects between friendly forces and the target. The presence of civilians within buildings and the enormous relevance of collateral damage need to be taken duly into account.

3.48. Many engagements in UEs will take place within or against enemies operating from buildings. This places a premium on the use of **precision weapons and munitions**, which have the ability to penetrate the building without necessarily destroying it.

3.49. When considering the use of fire support, due consideration should be given to the foreseeable wide area effects[27] of the munitions (due to their explosive yield and/or lack of accuracy or precision) and the subsequent risk of collateral damage. All measures, including in the choice of weapon, must be taken to minimize such damage. These should include avoiding the use of explosive weapons with a wide impact area in populated environments, as well as measures to reduce the wide area effects of munitions, as far as the tactical situation permits.

[25] See ATP-3.2.1 – *Conduct of land tactical operation* for more detail.

[26] Friendly forces are in close proximity of the desired mean point of impact and the supported commander accept the risk/danger to friendly forces.

[27] Wide area effects understood as effects from

- explosive weapons that are designed to create effects over an area (as opposed to a point target);
- explosive weapons whose blast and fragmentation radius is significantly larger than the target against which they are (planned to be) used.

Information

3.50. The particular role of information for operations in UEs becomes obvious by the information system being one of three constituent elements of an UE. The complexity of the UE leads to a tremendous amount of information, both relevant and irrelevant to operations, but sometimes difficult to discriminate.

3.51. SA and information passing through headquarters must be made available to the lowest level. Shared SA is key to understanding the progress of the battle and to avoiding friendly casualties.

3.52. Operations in UEs are conducted amongst the people. They are directly exposed to operations and gain direct experience. This, coupled with the likely possibility of quick and extensive reporting of transpiring events in the area makes them important players in the information environment. The proliferation of social media, the ability to forecast, shape, influence, and monitor the 'pulse' of the population will be critical to conducting successful operations. An adversary's ability to manipulate populations (willing or unwilling, aware, or unaware) and population flows has increased with the ubiquitous nature of social media over the internet and its influence over social/civil leadership.

3.53. **Information activities**, being a substantial element of all NATO operations, have become even more important in operations in UEs. The UE is characterised by multiple audiences and influential actors, each of whom is likely to have a different perception of, and reaction to, the information they receive. Information activities must therefore match key messages to particular audiences based on an analysis of their needs. These will often be local and specific to a particular area of the town or city and often different to those of a regional or domestic audience. Therefore, the targeting by information activities will often be imprecise and may cause unforeseen reactions elsewhere. Examples of objectives for information activities are:

- promote the authority of and generate popular support for legitimate HN institutions and security forces;
- isolate violent factions and criminal factions from the majority of public support;
- develop and protect consent (or tolerance) towards friendly forces by the local civilian population;
- communicate instructions, provisions and orders/rules to the civilian population;
- shape conditions prior to military activity in order to pre-empt negative effects;
- reinforce and strengthen the will and resolve of the indigenous security forces and allies;

- break cohesion between cooperating enemy factions;
- decrease morale within the enemy organisation.

3.54. **Cyberspace.** In an UE, military and non-military adversaries can use capabilities within cyberspace to create logistic and force protection issues or to create misinformation and cause civilian unrest, which may escalate the level of conflict by involving the civilian population and disrupt public order, overwhelming the HN police. Cyberattacks can disrupt computer information services and degrade information integrity. Cyberspace including defence and the exploitation of the utility becomes a warfighting environment in itself. Effects through cyberspace operations may include manipulation of urban systems to enable a physical operation, or a cyber-attack geared towards causing physical damage, such as the creation of industrial incidents or the manipulation of specific elements of a city's infrastructure. They can also undermine the consent of neutral populations and therefore require judgement, careful targeting, and close integration with other aspects of the NATO operation.

Civil-Military Cooperation (CIMIC)

3.55. The diverse social and organizational environment and the complexity of the terrain in an UE increases the number of relevant contact points tremendously and makes the early identification of non-military actors and their delineation paramount. The coordination and de-confliction of military and civil movements and actions to ensure freedom of movement/action, is of high complexity in urban terrain. Within all three CIMIC functions, civilian-military liaison, support to forces and support to non-military actors, the effort rises to an extent, which could rarely be satisfied by qualified CIMIC personnel alone. Dispersed forces make it difficult to provide CIMIC support at all places required. This has likely negative implications for effective and efficient interaction with nom-military actors. In this case, all military leaders must be prepared to conduct civil-military-interaction with limited enablement and facilitation by CIMIC.

3.56. The use of civil-military operation centres, set up outside restricted military areas, to allow civilians to directly interact with military forces and to address grievances for population while allowing friendly forces to gather information is significantly gaining importance.

Sustainment

3.57. Sustainability is defined as *the ability of a force to maintain the necessary level of combat power for the duration required to achieve its objectives*.[28] The capability is provided by combat service support (CSS), which is defined as *the support provided to combat forces, primarily in the fields of administration and logistics*.[29]

[28] NATOTerm.
[29] NATOTerm.

3.58. Operations in an UE are manpower and resource intensive. Small, distributed units will potentially require CSS more often and must be supplied throughout the sub-surface, surface, and super-surface areas of the UE. The consumption rates for combat supplies during operations in an UE are generally greater than similar scale operations in rural terrain. Forces will find it impossible to move large bulk resupplies up multiple flights of stairs or move them within crowded and confined areas. When external supply is required, the amount of supply must be balanced with the carrying capacity of the individual or the unit supplied.

3.59. Principles for providing effective CSS to units operating in an UE are as follows:

- Forces will require a high degree of self-sufficiency.
- CSS groups should be dispersed and decentralized and provided with the appropriate communications and command and control facilities to operate.
- The use of HN support and civil resources should be considered, when authorized and practical. However, if resources are obtained from the city, there will be an impact on city resiliencies, which has to be taken into account.
- In particular, for the purpose of humanitarian support the simultaneous utilization of required resources by other players, e.g. governmental organizations (GOs) and NGOs have to be considered.

3.60. CSS planning should anticipate the temporary isolation of elements of the force within the UE. This may be a result of encirclement by enemy forces or the result of successful interdiction by enemy forces of friendly lines of supply. Combat supplies and enhanced medical and equipment support should be held forward in sufficient quantities to allow for this, and alternate means of delivery and evacuation of casualties should be considered.

3.61. Logistic lines of supply should normally be cleared and stabilised before committing to high-intensity operations in urban terrain. This could include the dumping of non-essential supplies, the clearance of casualties from role 2 and 3 medical facilities and ceasing all non-essential equipment repair and maintenance work. Littorals and waterways may be used as LOCs, when capabilities to do so are available.

3.62. Injuries caused by sustained combat operations are likely to cause a significant increase in casualty numbers. Although buildings may give cover, the hard surfaces of streets and walls increase shrapnel injuries through the explosive effects of shells and grenades. In prolonged operations the damage to water and sewage installations provide an additional health hazard. It will often be difficult to evacuate casualties from fighting positions. A critical challenge in an urban setting may be posed by the need for timely medical treatment and evacuation. Locating and extracting casualties from urban structures, subterranean spaces,

rooftops, or heavily damaged, collapsed or ruined structures will be challenging. Therefore, the organization of the rescue chain has to be aligned, evacuation plans should be established in conjunction with medical units as far forward as possible in order to reduce the time between the time of injury to the first administration of medical care.[30]

The following points should be considered:

- The role 1 medical treatment facility may be reinforced and located closer to the area of combat.
- Helicopters may be used to evacuate casualties and to insert medical personnel. Evacuation from forward positions by helicopter may be possible but unlikely due to the inherent dangers of landing a helicopter too close to the scene of actual combat operations.
- Medical evacuation (MEDEVAC) by medical rescue teams has to be protected by the supported units.

3.63. The immediate requirement for a commander to search for, collect and evacuate, whenever possible, both civil and military casualties is of significant importance in the UE. Doing so will likely increase population support or neutrality with the potential to reduce enemy resistance.

3.64. Prior to operations, medical support for the civilian population and internally displaced persons (IDP) should be coordinated with NGOs, given a permissive security environment and willing NGOs.

3.65. The **physical-psychological strain**. Operations in UEs are extremely tiring, both physically and mentally. The constant sense of danger, the need to remain alert and the shock of actual combat, coupled with feelings of intense discomfort and isolation brought about by the nature of operations in the UE all contribute to physical fatigue. In addition to the physical effects, combat operations in the UE also contribute to a degree of mental exhaustion not normally found in operations in other environments. Often soldiers feel ethical dilemmas related to civilian casualties and collateral damage, and commanders should monitor the physical and mental well-being of their troops, conduct regular reliefs in place, ensure they remain aware of the situation, and treat signs of battle stress early.

3.66. When conducting combat operations in subterranean conditions, there are additional factors that can inflict psychological injuries. Operating in the subterranean environment is much like night combat operations. The psychological factors affecting soldiers during night operations reduce confidence, cause fear, and increase a feeling of isolation. This feeling of isolation is further magnified by the tight confines of the tunnels. The layout of tunnels requires greater dispersion between positions than is usual for other operations. Commanders should enforce measures to dispel the feelings of fear and isolation experienced by soldiers in tunnels.

[30] According to the maximum timelines mentioned in AJP-4.10 *Allied Joint Doctrine for Medical Support.*

These measures include leadership-training, physical and mental fitness, sleep discipline, and stress management. Commanders should maintain communication with soldiers manning positions in the tunnels either by personal visits or by field telephone. Soldiers manning positions below ground should be given as much information as possible on the organization of the tunnels and the importance of their task. They should be briefed on plans and on secondary or fall-back positions if their primary positions become untenable. Physical and mental fitness can be maintained by periodically rotating soldiers out of the tunnels so they can stand and walk in fresh air and sunlight. Stress management is also a factor of operations in tunnels.

Force protection

3.67. With its dense infrastructure and diversity of people, force protection in an UE is very resource-intensive. The canalization of movements, the limited lines-of-sight, and urban environmental threats increase the risk.

3.68. The specific vulnerability of **dismounted infantry** on one hand and the specific vulnerability of **armoured vehicles** in UE on the other can be mitigated through coordinated, mutually-supporting manoeuvre. The tank's size and armour can provide dismounted infantry with cover from direct fire weapons and fragments, while infantry screening can protect tanks and other armoured vehicles from falling prey to hand-held anti-armour weapons. With co-ordination, tanks can also provide moving cover for infantrymen as they advance across small open areas. However, enemy fire striking a tank is a major threat to nearby infantry. Fragmentation generated by anti-tank rounds and ricochets off tank armour have historically been a prime cause of infantry casualties while working with tanks in UEs**.** Armoured vehicles may be also used for

- protected evacuation of casualties, civilians and prisoners;
- protected transport of ammunitions, explosives and water.

3.69. The inevitable **use of infrastructure** should be based on the advice of MILENG staff. They will also play a major role in increasing the survivability of troops.

3.70. **Combat identification** is defined as *the use of identification measures to reduce friendly fire and increase the operational effectiveness of forces and weapon systems*[31]. Within the UE electronic combat identification measures may well be degraded due to the environment’s impact on the electromagnetic and acoustic spectrum[32]. Commanders should consider more basic identification measures such as reflective patches, panels or symbols and the use of infra-red markers during periods of low visibility.

3.71. **Force health protection** consists of actions taken to counter a number of debilitating effects within the UE. Additional health risks may include

[31] NATOTerm.
[32] See ATP-91 *Identification of Land Forces on the Battlefield in an Area of Operation* for more detail.

disease, hazards from TIM released by damaged industrial infrastructure, and the close proximity to working with the local civilian population. Due to the close nature and confined spaces within the UE, extra provision should be made for blast injuries during operations. Preventive measures for personnel, systems, and force elements should be considered.

3.72. Against air threats the ability of surface based air and missile defence (SBAMD) systems to detect and track targets in an uninterrupted manner is complicated by the presence of buildings and other structures associated with the urban landscape. A degree of mitigation can be achieved by deploying systems on high points, such as the tops of modern, multi-storey car parks where their open architecture reduces the risk from back blast at launch. The denser, the more built-up the OE is, the more difficult SBAMD operations will be. Consideration should be given to the deployment of SBAMD assets outside or on the fringes of the urban area in order to engage hostile aircraft before they reach the urban area. This will also reduce the risk of causing collateral damage in the event of an engagement over a populated area. Countering small UAS will be especially challenging in an UE. The inherent difficulties in detecting, tracking, identifying and engaging small UAS are further exacerbated by the buildings, structures, canyons, and other obstacles found in this environment. Planners must ensure the strategy to counter these systems is integrated with the broader SBAMD and air defence plan, to include passive air defence measures.

3.73. Inside of the UE additional considerations have to be made for **CBRN defence**, mainly because CBRN threats, once released, are more persistent within urban structures particularly within the subterranean environment. There will be less of a weathering effect, thus prolonging the potency of even non-persistent agents shielded inside structures. Once an UE has been affected by CBRN, forces should avoid it whenever possible. Decontamination of infrastructure is extremely time-consuming and requires intense efforts by CBRN defence forces.

3.74. The defence against **cyber-attacks** to internet-based services and mobile communications is currently not a land force activity. For more detail on cyber-attacks, see the joint function “information”.

3.75. **Screening of civilians.** Civilians fleeing conflict zones may fuel legitimate security concerns for NATO forces as they need to identify potential security threats among the displaced population. At the same time, a large influx of individuals fleeing over a short period of time poses major tactical challenges when it comes to ensuring their protection and provision of basic services. Displacement of a population therefore has implications that require careful planning in order to ensure a balance between security considerations and humanitarian ones and a dignified treatment of persons at all times. In this regard, displaced civilians should be presumed to not require further deprivation of liberty unless their screening process suggests otherwise. In the planning of security screening operations, the potential for detention, as well as the possible

need for the management of displaced populations in camps, it is required to ensure the following:

- Both screening and detention[33] are carried out in secure areas preferably by HN authorities, and allocated with sufficient and adequate human and material resources so as to guarantee a smooth processing of cases, respect of individuals' basic rights (and allowing for gender-respectful body searches), and appropriate material conditions. Should NATO-forces conduct such operations, frequent national caveats regarding detentions require special attention.
- Vulnerable groups of displaced civilians such as women, children, the elderly, sick, and disabled, are given priority in the screening and benefit from assistance according to their needs, and that they are provided additional security.
- Family members should, wherever feasible, be allowed to remain together. Should there be a need to separate them, care should be given that the time of separation be as short as possible. Children should stay with female members of their family, or alternatively with male relatives or with trusted caretakers.
- At the end of the screening process, displaced civilians should be promptly allowed to pursue their relocation into safe areas in a voluntary and informed manner, or transferred to IDP camps. Civilians who would be transferred to places of detention for further interrogation must be promptly informed of the reason for their detention and provided with the opportunity to inform their families about their whereabouts. Contacts between detainees and their relatives should be facilitated whenever possible within security, legal, and healthcare guidelines.

SECTION II – CONCEPTUAL FRAMEWORKS

General

3.76. The conceptual tools to visualize a commander's intent and the integration of different actions into a coherent concept of operations, the frameworks as described in ATP-3.2.1 – *Conduct of Land Tactical Operations* Chapter 4, are the valid tools for operations in UEs as well. The implementation of those frameworks within the typical characteristics of the UE require consideration of some specific implications. While the roles of the different elements of the different frameworks still apply, the actions required to fulfil those roles may differ for operations in UEs to some extent.

[33] See AJP-2.5 *Captured Persons, Materiel and Document* for more detail.

The operations framework

3.77. This framework is well suited also for operations in an UE, although the characteristics of the three elements in an UE have to be well understood.

3.78. There might not be one **decisive** action, but a row of activities over a prolonged timeframe leading to a decision. In this case, those operations must unequivocally advance the land operation towards the conditions envisaged by the objective. If the destruction of an enemy force is not the objective, often, those actions will seek to compel an enemy to act according to the will of the NATO commander. In the UE, such operations may be marked by a shift of emphasis towards the seizure and control of key terrain, either directly by friendly forces or by enabling the actions of partners. Maintaining control of key terrain will require maintaining a persistent presence on it. In stability oper

3.79. ations[34] a row of decisive actions could be the neutralization of adversary leadership.

3.80. **Shaping** action may occur not only in advance and in preparation of decisive actions of this phase of an operation, but more often simultaneously with and in close proximity to decisive actions with no direct effect, no link or timely connection. The intended effects may occur at a later stage, oriented to future phases of the operation.

3.81. Specific shaping actions in an UE could be controlling access to and egress from the UE, isolation to restrict mobility within UEs, building indigenous force capacity, evacuating civilians, precision strikes, securing a foothold in a well-fortified defensive sector, securing key infrastructure and protecting the civilian population.

3.82. In an UE **sustainment** includes often sustaining isolated detachments.

The functional framework

3.83. The functional framework fits well for operations in an UE also on lower tactical levels, where the focus is directed on a specific group of the enemy.

3.84. It may help to think in terms of **find** and **fix** being a matter of cunning and stealth and therefore conducted at varying rates of tempo.

3.85. **Strike** on the other hand should be conducted at a tempo to ensure that the enemy remains fixed. The essential requirement is that commanders determine a tempo of operations that they can sustain while achieving a higher tempo than that of the adversary thus exploiting the situation. However, where operations are taking place in a densely populated area, psychological effect of striking might be more successful than physical effects. Whilst planning physical action, consideration must be given as to how the environment affects the ability of tactical levels of command to achieve them.

[34] See Chapter 4, Section IV

The geographic framework

3.86. Although the purpose driven differentiation between deep, close and rear operations remains valid also in an UE, the organization of operations along deep, close and rear is much more difficult, because the geographic separation of the roles is often problematic due to the compression of geography. Deep operations may be very near to close operations, close operations are dispersed and there are often no clear limits for rear operations.

3.87. This framework may be relevant on higher tactical levels, where commanders have a rougher geographic perspective or where the operation is conducted in and outside the UE as well.

CHAPTER 4 – IMPLICATIONS TO LAND TACTICAL OPERATIONS IN URBAN ENVIRONMENTS

SECTION I – GENERAL

4.1. For operations in an UE, all fundamentals and principles as described in AJP-3.2 – *Allied Joint Doctrine for Land Operations* and ATP-3.2.1 – *Conduct of Land Tactical Operations* are completely valid. However, some additional principles need to be considered due to the specific circumstances of operating in the UE.

4.2. Operations in the UE require a higher force ratio than in rural areas, because of their de-centralized character, and because combat support may not be available at the same level as in other OEs. The fluid nature of operations in the UE means that the tactical situation in one area will often differ markedly from that in another. The disjointed UE will cause large units to split into small teams. Operations will likely comprise a large number of small-scale, fleeting engagements. Concentration of force requires preparation and time.

4.3. Commanders of major operations must be prepared to conduct operations simultaneously in both the UE and in the surrounding areas from where threats or other influences can come.

4.4. Commanders may have to contend with simultaneous execution of offensive, defensive and stability operations with different types of tactical activities, executed across multiple domains, in a complex physical environment, and against a hybrid enemy.

4.5. Particularly in the UE, members of civilian organizations (police, rescue services or relief organisations) may pursue similar objectives to NATO in terms of security or relief for the people. Where appropriate, military activities must be harmonized with activities undertaken by these organisations.

4.6. Operations in the UE require cooperation and collaboration with other actors. Commanders may be able to influence specific urban areas through their broader networks rather than by entering or occupying such areas. Land forces must be able to identify and engage key leaders at all levels early, while at the same time supporting the HN government and security forces and NGOs. Integrating urban government leaders into operations can significantly increase SA and understanding of local dynamics.

4.7. Planners must always consider the potential consequences of the destruction of infrastructure on the civilian population’s perception and their access to vital services. The preservation and protection as well as the potential disruption of such facilities need to be carefully planned.

4.8. Given the considerable risk to civilians in the UE and the obligation under LOAC to protect them, consideration must be given to civilian evacuation before the commencement of operations. Commanders should endeavour, in areas under their control, to provide civilians - who wish to evacuate - with an

evacuation route that is safe from hostilities, mines, UXOs, and other threats. Detailed planning will be essential in providing the opportunity and information for the civilian population to evacuate a particular area or even the entire built-up area, including ways of controlling the movement and providing for their needs when away from their homes. Thought will also need to be given to countering adversary attempts to prevent the civilian population from moving, whether by drawing on their support or through intimidation. Stability policing (SP) can contribute to the disruption of the activities of illegal actors trying to exploit these movements of large masses of people. Commanders will also need to facilitate the safe return of civilians to their homes as soon as possible. Commanders need to accept that there will always be sections of the civilian population who do not wish to, or cannot, evacuate, and that those civilians retain their protected status under the LOAC.

4.9. Knowledge of the nature and location of underground facilities is of great value to both the attacker and defender. To exploit the advantages of underground facilities, detailed maps and plans and, if possible, a thorough reconnaissance are required. Subterranean features include sunken garages, underground passages, subway lines, utility tunnels, sewers, and storm drains. Many of these features allow the movement of troops. Even in smaller towns, sewers, and storm drains permit soldiers to move beneath street-level during operations.

4.10. The commander has five options to mitigate risks related to underground facility or subterranean system exploited by the adversary:

- bypass[35] (handover);
- neutralize[36];
- control[37];
- contain[38];
- clear[39].

Each of these options requires a different amount of time, effort, and combat power. The choice of option depends on the role of the facility within the urban system and for the operation, the risk involved, and the available capabilities of friendly for forces as well as the opportunity costs involved in each choice.

4.11. The challenges of conducting operations in the UE are exacerbated at night. The risk of fratricide and collateral damage in the UE is even higher than in

[35] To move around an entity or obstacle to maintain momentum. (NATOTerm)
[36] To render a hostile entity or materiel temporarily incapable of interfering with friendly forces.(NATOTerm)
[37] To exert influence over an entity, process, object or area to establish, maintain or prevent a specific situation or event. (NATOTerm).
[38] To restrict an entity's freedom of movement to within a specified area.(NATOTerm)
[39] To ensure an area is free of the enemy troops and/or their obstacles.
(This is a new term and definition being processed for NATO agreed status via terminology tracking file 2011-1231)

operations in other environments. Also, the ability to anticipate or understand the adversary's movement and intentions is impaired, while the coordination of friendly forces is made much more difficult in the UE. These factors increase the need for greater control and restrictions on individual action.

4.12. Operations in littoral and riverine areas within or close to UEs may be conducted by specialized forces either

- as part of a greater amphibious operation, where land forces operate as a landing force in an UE or where land forces are deployed in support of a joint/naval operation; or
- in support of a land operation in an UE.

In the second case, those specialized capabilities may be made available for the land force commander within his order of battle. However, because these are rare capabilities, they may be either limited in size or available only for a limited time. It is the commanders' responsibility to coordinate their concept of operation with the availability of riverine capabilities and to establish mitigation concepts for phases where they are not available. If no specialized capabilities are available, land forces can control water areas only by fires, mainly direct fire or air support.

Principles for operations in littoral and riverine areas are described in detail in ATP-08 Vol I – *Doctrine for Amphibious Operations* and ATP-08 Vol III – *Riverine Operations*.

4.13. LOAC requires that, after an engagement, all possible measures be taken to search for and collect the dead and to treat them in accordance with the requirements of the LOAC. The management of human remains in the area of operations must therefore be factored into the planning of operations in an UE. This may include developing or supporting the capacity of relevant local partners in coordination with civil defence authorities, possibly reinforced by friendly forces. Apart from the legal implications, failure to handle the dead appropriately will likely result in a protracted humanitarian situation in which persons remain unaccounted for.

SECTION II – OFFENSIVE OPERATIONS

General

4.14. The main purpose of offensive operations is to impose one's own will upon the enemy by defeating him through the use or threat of force.

4.15. Offensive operations could be launched in or into an UE. In both cases the purpose is:

- to defeat or destroy enemy forces; and/or
- to gain control of the UE or part of it as a prerequisite for the creation of effects and to protect the force.

Defeat or destroy

4.16. The defeat or destruction of enemy forces can include both regular and irregular enemy forces.

4.17. In general, offensive activities like attack will be the core of these operations. When applied against regular and irregular forces, however, it will be most likely a combined threat, where the enemy is applying different conventional and asymmetric tactics in order to make best use of the advantages the UE provides. The requirement for high force levels will lead most likely to heavy casualties and collateral damage, which might not be acceptable or legal. Because of those circumstances, a deliberate, direct offensive operation, as one would conduct in open terrain has to be carefully weighed against the benefits.

4.18. Land Forces should not become over-extended; strict limits of advance should be imposed. These may be defined by a street, a block, or a physical boundary such as a river, canal or railway line. In some circumstances, it may be necessary to isolate parts of the city or town by encircling, screening, or deploying a guard force until more favourable conditions for more direct action present themselves.

4.19. The UE may reduce the advantages of a technologically superior force. The congestion of ground avenues of approach combined with the massive size of an UE can make getting to an objective from the periphery difficult if not impossible, let alone achieving an operational effect for acceptable costs in time, resources, and casualties.

Gaining control in an urban environment

4.20. Control is defined as *to exert influence over an entity, process, object or area to establish, maintain or prevent a specific situation or event*[40].

4.21. Although **control** of a defined part of an UE seems to be terrain-oriented, it is different from terrain-oriented offensive operations outside the UE, because of the greater complexity in terms of objectives involved. The objective may be to secure a port or a communications centre, to eliminate the threat to a friendly government or the urban civilian population, or to deny the enemy freedom of movement within the UE.

Gaining control over an UE is more than just seizing, occupying and securing terrain in one manoeuvre. Due to the complex urban systems and the principle of operations with effects in all dimensions, control is a task, which implies actions in the different urban systems simultaneously. The specific requirements for ensuring control depend on the detailed mission, the specific situation in the UE, and the expected threats. To achieve complete control is unlikely. The level of control possible depends on the capability of the force.

4.22. The size of UEs and the required capabilities to meet the above-mentioned, multi-dimension and multi-domain challenges makes gaining and maintaining

[40] NATOTerm.

control of territory in an UE more difficult than in other environments, requiring the employment of specific UE-related approaches. Those are:

- the time limited approach;
- the key terrain related approach;
- the full sequential approach.

4.23. These alternative approaches may be used in combination, either sequentially or simultaneously in different parts of the UE as the developing operational situation dictates. Commanders will implement the chosen approach by a concept integrating the required tactical activities (as described in ATP-3.2.1.1 – *Conduct of Land Tactical Activities*, specified in Chapter 5 of this ATP), and using the forms of manoeuvre (described in ATP-3.2.1, specified below).

The time limited approach

4.24. The time limited approach is aimed at isolating the adversary by means of an encirclement of the UE followed by reconnaissance and raid-type activities. Enemy forces operating under the cover of UEs should be cut off from supplies and reinforcements from outside, to create favourable conditions for subsequent (time limited) activities to establish control of the UE.

4.25. The time limited approach does not seek a rapid resolution of the situation. This approach will be chosen if sufficient information on the enemy in the UE is not yet available, or if the enemy is too strong for a direct confrontation within the UE and force protection has priority.

4.26. However, there are some risks involved. This approach neither allows for the UE to be controlled through the presence of friendly forces, nor does it ensure the protection and safety of the civilian population. Moreover, it provides no means or opportunity for exerting influence on the attitude and demeanour of the civilian population. Related activities are mainly limited to assets and methods that can be employed from a distance (e.g. leaflets, TV, radio). On the other hand, enemy forces can communicate directly with the local people, use the isolation of the UE for propaganda purposes or misuse the civilian population as an instrument to exert psychological pressure.

4.27. With friendly forces generally obliged to make arrangements that allow the civilian population to leave the encirclement, there is always the risk that the measures taken to isolate the enemy will not be successful, since in practice, and particularly in asymmetric warfare, it is difficult to distinguish between the enemy and civilians.

The key-terrain-related approach

4.28. The dependence of a functioning UE on key terrain and key points offers the opportunity to gain control over these areas without being present throughout the area.

4.29. As part of the key terrain related approach, friendly forces are employed to rapidly seize selected areas and points. By seizing these areas and points, the enemy is denied the ability to use them or to prevent their use by friendly

forces. This way, important urban infrastructure and facilities are preserved and kept intact for the remainder of the operation. Also, the placement of friendly forces among the civilian population helps ensure their support by members of that population, and it helps ensure that infrastructure and facilities are protected. Since this approach does not involve exercising control over the entire UE, it requires a relatively small number of forces while offering considerable opportunities to influence the UE.

4.30. Seized/gained areas and points may provide the basis for the subsequent extension of control over the entire area. The successful implementation of the key-terrain related approach requires good knowledge of the urban area, based on thorough intelligence and reconnaissance efforts, which allow for a reliable identification of key areas and points as well as of their impact on the civilian population, the adversary, friendly forces, and the intended conduct of operations. The control of key areas and key points enables the commander to positively influence the living conditions from an early stage of operations and thus improve the mood among the civilian population. On the contrary, it confines the potential courses of action of asymmetric adversaries who heavily rely on the support of the population.

4.31. However, the key-terrain-related approach is not without risk. The fact that friendly forces do not control the entire UE allows the enemy to occupy areas where no friendly forces are present. Even areas that friendly forces had seized/gained and subsequently withdrawn from may once again fall under the influence of hostile forces within a very short time.

4.32. For that reason, it must always be carefully considered whether friendly forces can leave the key areas or key points once seized/gained or whether they have to continue to occupy them. If they stay, arrangements will have to be made to allow for a relief operation in case of encirclement. The forces must be robust and sustainable enough to accomplish their mission independently for a limited period of time.

The full-sequential approach

4.33. The full-sequential approach is aimed at gaining control over the complete area, though not in one single move but step by step. The objective is to increasingly deny the enemy the opportunity to create effects in the area concerned. This approach is to be chosen, if sufficient forces are available and if the situation requires effects throughout the area. For that purpose, the area of employment is subdivided into sectors over which friendly forces, one by one, gain control.

4.34. The sectors are chosen in such a way that:

- the coherence of friendly operations is maintained;
- the enemy's possible courses of action are quickly limited;
- the individual sectors are easy to identify by the forces on the ground, thus facilitating coordination;
- the operation can be easily continued from the seized sectors.

4.35. Gaining control over a chosen sector is done in general by the steps of clear, hold, and build[41].

4.36. **Clearing** a sector requires the elimination of any threat to friendly forces and to mission accomplishment in that sector of the UE. Clearance of large areas may be only undertaken, if the force has sufficient resources to achieve it and to maintain the gains, but it is likely to be expensive in terms of both friendly and civilian casualties. Consequently, only mission-essential infrastructure/locations and vital communications should be cleared. Outside the cleared areas, intelligence driven raids and precision strikes might offer a better alternative.

4.37. **Hold** could mean to occupy an area for an extended time if required or to maintain control by other means.

4.38. Control may be supported by specific measures to re**build** urban structures or systems in order to gain the civilian population's support.

4.39. The full sequential approach allows shifting the main effort more easily. With every sector gained or seized, further activities can be adapted accordingly. Thus, the commanders' freedom of action is maintained, because it is up to them to decide where to continue the operation in response to the prevailing situation. Success depends on whether the forces are able to retain control over the sectors they have seized. This can be guaranteed only by a continuous presence, thus requiring an increase in forces as more and more sectors are seized.

4.40. This approach, also entails some risks. It requires a great deal of time and manpower, and as friendly forces have to cover an increasingly large area, they are thinned out and thus more and more exposed to potential threats and to the danger to losing control over the occupied territory. Reliably identifying and neutralising enemy forces in the sectors to be seized is a particular challenge. This requires intense intelligence and reconnaissance activities.

4.41. The fact that individual sectors of the UE are seized one at a time enables the enemy to use the civilian population in those sectors not yet controlled by friendly forces for their own purposes. They may even leverage reports of actual or alleged hostilities in the sectors not yet controlled by friendly forces to influence public opinion. Furthermore, an enemy may use sectors still under their control to exert an influence on those already controlled by friendly forces (e.g. by disrupting energy supply).

Isolation

4.42. Offensive operations in the UE very often include the isolation of UEs or a vital part of it as a prerequisite for offensive activities against adversaries or the enemy. Isolation may therefore be characterized as an UE-typical operation.

4.43. Complete isolation however, is – depending on the size of the UE to be isolated - difficult to achieve. Often forces will not have the force levels required to

[41] See also ATP.3.4.4.1 – *Counter-Insurgency Tactics*.

prevent all movement into or out of the city. Intelligence, surveillance, reconnaissance and fires are then a minimum requirement.

4.44. The cordon force must be strong enough to face inwards and outwards. In case the UE includes littoral and riverine areas, specialized capabilities are required to include those areas.

4.45. In case the isolation has to be enforced, it will follow the principles of encirclement.

4.46. Successful isolation can make a deliberate attack on an urban area unnecessary, keeping friendly and civilian casualties and collateral damage to a minimum. This will be the case when the isolation is inducing the enemy to capitulate or evacuate through a carefully orchestrated combination of all applicable effects.

4.47. Isolating an irregular enemy includes conventional methods and equipment, but also requires simultaneous, careful information activities like influencing the enemy's (and perhaps even the civilian population's) information flow on the internet and other electronic forms. Controlling access to the UE also offers a valuable means for land forces to collect intelligence from the population who may continue to transit in and out.

4.48. It may be advantageous to deny external help getting to the enemy, either by stopping, or perhaps by controlling, movement into and out of the urban area, but leaving the means for the adversary to escape. If the operation is focused on defeating an enemy, deliberate gaps within the isolation that allow the enemy to escape may provide the opportunity to engage them outside the UE.

4.49. Isolation may give the enemy the opportunity to profit from the siege's effects on the civilian population. In those circumstances a partial or flexible approach to controlling access and egress may be preferred in order to ensure that unnecessary suffering by neutral local actors is minimised, so that regional, domestic or political support is not undermined.

Forms of manoeuvre

4.50. Forms of manoeuvre are the arrangement and combination of activities and movements by manoeuvre forces in terms of space, in relation to the enemy and time. Offensive operations may be conducted through different forms of manoeuvre, as described in ATP-3.2.1 – *Conduct of Land Tactical Operations* Chapter 3 Section II:

- frontal attack;
- penetration;
- flanking attack;
- envelopment;
- turning movement; and
- infiltration.

They may be applied within an UE or in operations conducted in areas including both UEs and open terrain outside the UE. Urban specifics are as follows.

4.51. In an UE **penetration** often has, beyond the disruption of the enemy's defence, the purpose to seize objectives quickly, which may provide a basis for establishing control over the UE, such as power plants, water plants, food storage and distribution centres (key terrain related approach). Because speed is paramount in this case, the commander has to be focused on the objective and less on flanks or lines of communication.

4.52. The significance of those objectives for control and the urban characteristics constitutes for penetration in an UE in general a considerable higher risk to flanks than the same operation in open field. To minimize this risk movement to the objective area may be either surface, subterranean, above the surface or a coordinated mixture of them. Stealth could well be the preferred movement tactic in order to maximize force protection and surprise. Once the objective has been seized, the penetrating force has to be prepared to counter immediate enemy assaults or attempts to isolate the objective.

4.53. A **thrust** is a type of penetration in an UE, where secure flanks are essential. The purpose is less to disrupt the enemy defence by speed and surprise but to make the enemy defence unsustainable by driving a massive deep wedge of forces into his defensive system. The urban thrust can be conducted on multiple axes simultaneously. Ideally, this will force the enemy's withdrawal and exposure without the necessity of a room-by-room clearing of buildings.

4.54. **Infiltration into UEs** requires consideration of some additional specifics. The outskirts of an UE may not be strongly defended. Its defenders may have only a series of anti-tank positions, protective posts on the principal approach, or positions blocking the approaches to key features in the city. The strong points and reserves may be deeper in the UE. If this is the case, a force is able to seize areas or objectives inside the UE by by-passing the units or sub-units between those enemy positions on the outskirts. Moving by stealth on secondary routes (e.g. subterranean or super surface), by using cover and concealment provided by back alleys and buildings, the force is able to seize undefended or weakly defended key street junctions or terrain features to isolate enemy positions, and to help follow-up units pass into UEs. Such an infiltration is ideally performed in poor visibility or darkness.

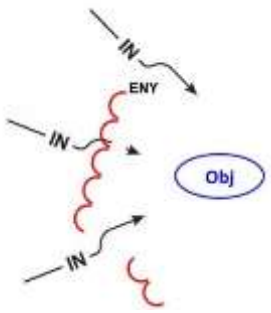


Figure 4-1: Infiltration into UE

A co-ordinated counter-attack using infiltrated forces, at the same time as other attacks from outside may rapidly overload the enemy, leading to collapse.

4.55. **Urban saturation**[42] constitutes an additional form of manoeuvre for UEs. Force elements are operating in a dispersed, non-contiguous fashion, exploiting the complex and unclear terrain. The purpose is to engage the enemy on a wide frontage to stretch their ability to mass combat power. It is reliant on clear and concise orders and mission command at all levels with comprehensive coordination measures.

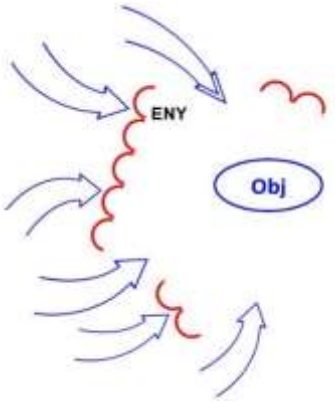


Figure 4-2: Urban saturation

SECTION III – DEFENSIVE OPERATIONS

General

4.56. The purpose of defensive operations is to oppose an enemy's offensive operations and to deny the enemy's aims or objectives.

4.57. Defensive operations have to be conducted in the UE to:

- defend against a regular enemy's efforts at trying to seize and occupy the UE or a part of it from outside the defended area;
- maintain the control of the UE or parts of it to eliminate asymmetric threats inside the UE, because even a regular enemy will make additional use of asymmetric means and methods inside the UE to exploit the possibilities provided by an UE and to challenge the defender to a maximum.

Defend an urban area

General

4.58. If the mission is to break the enemy's advance and to destroy him through a defensive operation within a major combat operation[43], it is the land force commanders' decision - within imposed constrains - where to defend. Although

[42] Also known as urban swamp or urban swarm.
[43] A series of battles and engagements (AJP-01).

an UE provides considerable tactical advantages to the defender, commanders will, to prevent casualties among the civilian population and damage to the urban system, decide to defend inside an UE only if unavoidable.

4.59. A major defensive operation will be conducted inside an UE when:

- the enemy's advance to seize the UE cannot be stopped outside the UE;
- the operational and/or strategic conditions require the defence of the UE in order to protect an ally's political institutions and economic infrastructure.

In all cases the benefit of operating in an UE has to be weighed with the strategic consequences caused by civilian casualties and collateral damage (whilst ensuring that LOAC is complied with at all times).

4.60. Wherever possible the civilian population should be encouraged to accept evacuation. If this is not accepted or not possible, the responsibility for their sustainment and protection will fall to the NATO commander if authorized.

4.61. In UEs the commander must consider the terrain restrictions. This will require a higher density of troops and smaller defensive sectors than in open terrain. The tactical situation, the density of buildings, rubble, and street patterns will dictate not only the frontage of the formation and units but also the avenues of approach.

4.62. In planning defensive operations, commanders must anticipate that the enemy will attempt to isolate the UE. Commanders defeat this effort by allocating sufficient defending forces outside the urban area to prevent its isolation. The wider the perimeter to be defended, the more difficult it will be for the enemy to isolate the UE, but the wider perimeter will also lead a decreased concentration of friendly forces. Commanders must weigh the advantage of breaking isolation against the higher risk of enemy infiltration and raids through thin lines.

4.63. Information protection and operations security based on deception can also be used to mislead the enemy regarding the defensive array in and outside the urban area.

4.64. If the enemy has successfully isolated the UE, commanders of a major operation have several courses of action such as an exfiltration, a breakout attack by forces defending the UE, or an attack by forces outside the UE to relieve the siege.

4.65. At the end of a successful defensive operation, commanders generally expect civil authority, control, and jurisdiction to increase. Additionally, the civilian population may be anxious to return to the urban area. Defensive combat requires virtually complete military control of the urban area; however, after the successful defence, a rapid **transition** occurs from military control to civilian or joint military and civilian control afterward. Important transition tasks include demilitarizing munitions, clearing obstacles, and searching for isolated enemy pockets of resistance. Conclusion of defensive operations also requires the transition to tasks such as evaluating structures for safety, restoring essential

services, and possibly standing up law enforcement. Commanders of major operations anticipate these requirements and begin early preparations to ensure a smooth, successful transition.

4.66. An operation to defend an UE may follow the stages of

- covering force;
- main defence; and
- countermove (if applicable).

Details of these stages are described in ATP-3.2.1.

Covering force battle in UEs

4.67. As in any other defensive operation, the covering force has the tasks to conduct reconnaissance, provide security to the main defence force, delay and canalize the enemy, and disrupt his approach. In case a corps or division commander decides to deploy a covering force, it should operate wherever possible outside the UE. However, pending the location of vital ground and related key terrain this might not be feasible.

4.68. The force is then to be grouped into a series of posts, which dominate the approaches and perimeter of the UE. The grouping for each post could comprise a mix of infantry, reconnaissance, armour, and anti-armour elements. Support from fires, air, aviation, and ISTAR assets should be integral to the grouping. MILENG capabilities are required to provide mobility corridors and counter mobility measures for withdrawal. Elements should be sited covertly at the perimeter on the outskirts of the UE and beyond. They should not be easy to identify as they are likely to be high priority targets for enemy indirect and air attack.

4.69. The amount of combat power allocated to the covering force should be balanced against the risk that it would be likely to sustain a high number of casualties. The withdrawal of the force into the UE requires planning in detail and rehearsal.

Main defence in UEs

4.70. As described in ATP-3.2.1, a defensive operation could be conducted following either the mobile- or the area-related method. In the UE the most common and the most suitable method is an area defence approach organized around the tactical activity defence. However, due to the characteristics of this distinct environment, the traditional area defence needs to be adapted to meet the specific UE challenges.

4.71. If no dedicated covering force is deployed defending commanders will then employ as appropriate - within their main defence battle

- forces at the perimeter of the UE (perimeter force) for reconnaissance and to cover the main defence forces and

- mobile forces forward the main defence positions to disrupt the enemy assault and canalize him to the planned engagement area (EA) (disruption force).

4.72. In a major defensive operation, the need to reduce collateral damage and the increasing likelihood of a hybrid or irregular enemy demand more flexible, targeted and agile defensive options. The definition of key terrain will allow the defender to identify areas where the operation needs to be focused, because it preserves the integrity of the defence and provides ease of movement to the defender. In the UE, key terrain may include bridges over rivers or canals, dominant building complexes, political centres, public utilities etc. or even open areas.

4.73. The main defence battle will take place in a series of defended localities with mutually supporting strong points focused around a main EA. This battle will comprise an aggressive defence and small and local counter-attacks, preventing the enemy from grouping or regrouping, encircling or trapping any defended locations.

4.74. The greater dispersion will avoid the requirement of the static strong point defence producing a considerable target. Defended points could be at section level or below avoiding concentration and reducing the risk. Allowing the enemy to attack what it believes to be a well-defended locality, manned, however, only by a small force, allows for a greater concentration of force to counter-attack.

4.75. If required, decentralized reserves should be designated in each sector or area, additional or in exceptional cases instead of a centralized reserve.

Countermove in UEs

4.76. In UEs offensive action is mostly executed through local counter-attacks. Should a countermove by echelon forces be conducted as element of a mobile defence it will follow principle as described in Section II.

Delay in defensive operations

4.77. The purpose of the tactical activity delay is to trade terrain for time. Although an UE provides theoretically good terrain conditions to delay the enemy's approach, there are also tactical disadvantages such as the high risk of close combat with the resulting problems to preserve combat power and the high number of forces required in an UE to be successful. Regarding the expected civilian casualties and the collateral damage potentially linked to delay, there is no good rationale behind using an UE for a deliberate delay.

4.78. Commanders will only conduct a delay in an UE:

- in the outskirts or in low density residential areas (see annex A);
- as element of the covering force battle;
- if forced by an enemy advance which they are not able to counter otherwise.

Exercising and maintaining control over an urban environment

4.79. An enemy will try to challenge any NATO defensive operation through asymmetric means. In an UE those threats will not only be directed to NATO forces but also against all urban systems all over the UE to create multiple challenges for land forces, i.e. irregular forces in the rear, a breakdown of essential services, and social unrest, all of which undermine the land force's freedom of action. Controlling an UE within a defensive operation is therefore aimed at denial of adversary manoeuvre and freedom of action, ensuring the security of military units and the security of the local civilian population as well as other civilian actors and their installations.

4.80. Maintaining control of an UE may be necessary:

- as part of a warfighting operation;
  - in support of actual defensive operations, for example in rear areas;
  - in every area occupied by friendly forces, for example an objective seized;
  - in support of a defensive posture to deter imminent aggression by an adversary;
- as part of a security or peace-support operation.

4.81. Maintaining control may require defeating small enemy units, special forces, or irregular forces who reside inside or near the UE. Many modern urban areas are too large to be completely occupied or even effectively controlled without an enormous force. Therefore, friendly forces must focus their efforts on controlling only those elements essential to mission accomplishment. At a minimum, this requires control of key terrain. In the UE, commanders determine key terrain based upon its functional, political, economic, or social significance. Within the urban defensive context, it will mean controlling routes or points overlooking the enemy's movement possibilities and potential axes of advance.

4.82. Civilians present within the UE complicate the ability for commanders to maintain control over their assigned AOR. Parts of the civilian population may also act as information gatherers for the enemy or assist adversaries in other ways. If the evacuation of civilians is not possible, commanders have to consider the consequences of their presence and adapt plans accordingly. They have to ensure protection of civilians and their essential services on one hand, but on the other, they have to deny civilian support to the enemy in order to protect their operation. The latter includes measures to undermine enemy influence, but also to restrict interference through civilians' behaviour or actions.

4.83. Maintaining control is therefore based on security activities, but may include offensive or defensive tactical activities as well. In particular, when the civilian

population is present, stability activities[44] may support the purpose of maintaining control.

4.84. If there is still a functioning and cooperating HN, for example in operations on Alliance territory, their authorities should be involved as much as possible. If this is not the case, commanders have to act according the LOAC, in line with the obligations as occupying power.

SECTION IV – STABILITY OPERATIONS

4.85. The purpose of stability operations is to set the conditions that enable authorities and other organizations to function properly and maintain or create the conditions leading to a more secure and less threatening environment. The principles for stability operations and activities are described in ATP-3.2.1, ATP-3.2.1.1– *Conduct of Land Tactical Activities* and ATP-3.22 – *Allied Joint Doctrine for Stability Policing*.

4.86. Stability operations may be conducted as:

- a consequence of earlier or concurrent major combat operations; or
- a part of operations under the security or peace support theme.

In the first case, stability operations should be planned and conducted concurrently with offensive and defensive operations.

4.87. Due to the nature and the purpose of stability operations, the main focus of efforts will be anyway within UEs, where most of the actors contributing or contesting stability will be concentrated.

4.88. Stability operations are not focused on force protection and maintaining the land forces freedom of movement, but on the protection and needs of the population itself, as an intrinsic element within an urban centric system. This is primarily ensured by the presence of friendly forces. This presence may be permanent or temporary, and it may vary in the levels of intensity in the individual sectors of the area in question.

4.89. Apart from being a show of force, military presence also serves to carry out monitoring and control tasks. Monitoring is aimed at identifying the location and identity of possible asymmetric threats.

4.90. As regards the control of the UE, friendly forces always play a dual role. On the one hand, they must institute control measures, which are often misinterpreted as a sign of mistrust while, on the other hand, they try to gain the confidence of the conflict parties and the civilian population and to find support for their mission and objectives.

4.91. Besides demonstrations of friendliness and commitment to dialogue, the demonstration of preparedness to escalate, to use military means beyond the

[44] See ATP-3.2.1.1 – *Conduct of Land Tactical Activities*

limits of a routine presence, is another important aspect of stability operations in UEs.

4.92. During the immediate aftermath of a conflict in an UE the HN police force may have been disbanded, be ineffective, or may not have the support of the local population. In this situation land forces should expect to be drawn into **stability policing** issues which usually follow wider military security tasks. The absence of effective policing leads to the following implications.

- Land forces are likely to be responsible for establishing a relationship with the local community and its representatives and for crowd management. This requirement may have to be met against a background of a murky situation, difficult coordination and language difficulties.
- Land forces will be constrained by the LOAC and/or human rights law – as applicable. Furthermore ROE, national policy and the need to apply reasonable and proportionate force will guide commanders decisions.
- Land forces may be able to resort to equipment and tactics that will be considered politically unacceptable under normal circumstances (such as the use of armoured vehicles).
- A breakdown of law and order will require land forces to be able to withstand a far higher intensity of violence than would be expected of a civil police force.
- The level of force necessary will be governed by the need to prevent crime, preserve life and prevent serious injury. This may require the application of force against rioters, looters and others engaged in serious crime in appropriate circumstances.

CHAPTER 5 – IMPLICATIONS FOR TACTICAL ACTIVITIES IN URBAN ENVIRONMENTS

5.1. The role of tactical activities within land operations is described in ATP-3.2.1 – *Conduct of Land Tactical Operations* Chapter 1. ATP-3.2.1.1 – *Conduct of Land Tactical Activities* provides the description of the different tactical activities and the principles for their implementation.

5.2. Although all of those principles apply in operations in an UE as well, there are some specifics to be considered, which are described in the following paragraphs.

SECTION I – OFFENSIVE ACTIVITIES

Attack

5.3. The attack will be conducted along the stages:

- mounting/approach;
- assault, subdivided in
  - crossing line of departure;
  - break-in; and
  - fight through;
- consolidation.

More details can be found in ATP-3.2.1.1 – *Conduct of Land Tactical Activities*. The characteristics of the UE however demand some specific additional consideration.

5.4. Where required and feasible the attack in an UE has to be prepared by shaping actions, for example by **isolation** of the enemy (see Chapter 4 Section II for more detail). The force which isolates the enemy to be attacked will support the attacking force' by providing information on enemy dispositions.

5.5. The **approach** and the **crossing of the line of departure** will be most likely within a very compressed geographic area that requires specific protection measures. The isolating force will cover the approach and the forward passage of lines.

5.6. The **break-in** to an UE is very often not only a break-in in the enemy's defensive position but inevitably connected with breaching into infrastructure. It has to establish a foothold on the edge of the enemy defensive positions, establish routes for forward passage of lines of follow-on forces and determine the strength, location and future intentions of the enemy.

5.7. The break-in will be supported by direct and indirect fire support of the isolating force. The break-in force supported by fire support elements should comprise mainly infantry and MILENG capabilities, like combat engineers or EOD, best

employed if decentralized and in close cooperation with infantry. Armour may be used to support the break-in, but needs to be supported by infantry to reduce its vulnerability to hand held anti-tank weapons.

5.8. The use of high explosive (HE) and smoke to support the break-in may neutralize enemy positions and cover the movement of assault forces.

5.9. From the foothold secured at the break-in the force will **fight through** to **seize key objectives** towards the final objectives. Even on low tactical level the attack in an UE will be directed to several objectives or a number of intermediate objectives. The aim is to secure objectives from which to launch an assault on to the next objective or to unhinge the enemy's defence by dominating ground, destroying enemy defensive positions or blocking enemy withdrawal and logistic routes. Objectives and routes to and between them may need to be held in order to prevent enemy counter-attacks or re-infiltration.

5.10. The attack may be conducted at night, either as a covert or overt attack, as an enhancement to security. This requires however, troops both trained and specifically equipped for night operations.

5.11. The **consolidation** stage may - beyond reorganization and sustainment - require **clearing of remaining resistance pockets**. The aim is to clear all remaining threats from the area. This task is likely to be executed by follow up force elements. Clearing resistance pockets in an UE requires specific considerations such as:

- the use of control measures, for example sectors to best coordinate a systematic clearance of the area;
- clearance tasks may be allocated to small combat teams down to section level.
- clearance tasks should not only focus on enemy forces but also include threats left by enemy forces, such as EO including mines and IEDs;
- clearance tasks are best done in daylight;
- provision has to be made for collection of casualties, handling of captured persons (CPERS) and evacuation of casualties and CPERS. CPERS shall be evacuated, as soon as possible after their capture, to camps situated in an area far enough from the combat zone for them to be out of danger;
- the treatment of casualties, control of prisoners of war and evacuation of civilians is likely to require considerable manpower and time.

5.12. Despite the prior clearance, the threat from snipers and counter-attack may remain in the consolidation stage. At a minimum, temporary defensive measures should be adopted at all levels, including the preparation of hasty defensive fire plans.

5.13. **Subterranean** passages provide the attacking force with covered and concealed routes into and through UEs. The attacker may launch his main offensive activity at street level while using subterranean passages to infiltrate a smaller force. The aim of such an activity may be to insert a unit into the

defender's rear, thereby, disrupting his defence and obstructing the avenues of withdrawal for his forward defence. Even if a subterranean effort is not immediately successful, it forces the defender to fight on two levels and to extend his resources to more than just street level fighting.

Raid

5.14. When control of a bigger area within an UE is not possible, raids provide the possibility to put pressure on the enemy by limited effort. This applies for example within the time-limited approach to gain control in an UE. Raiding can have both a physical and psychological effect. The neutralization of an enemy commander or destruction of key equipment can degrade the ability of an enemy to fight. However, perhaps of greater importance, the psychological effect on other adversaries groups can also be significant. Raiding demonstrates freedom of action, achieves surprise and keeps adversaries off balance by retaining the initiative and forcing them to respond to events. When accompanied by information activities, raiding can be very effective in undermining the will of an enemy to resist, improve own SA and maintain offensive spirit.

Relief of encircled forces

5.15. The need to operate in smaller groups in urban terrain, whether carrying out offensive, defensive or stability activities, and the tendency of close terrain to isolate small units, makes the likelihood of having a patrol or sub-unit encircled by an enemy very real. Isolated units will be a tempting target for irregular adversaries in particular, who will seek opportunities to achieve a significant propaganda victory. Furthermore, the threat of restricted communications makes coordinating the relief of isolated troops particularly challenging. All groupings must have the force level and weapon mix to give them the ability to be self-sufficient until relief can be effected. The enemy must realize that how relatively weak a force may be, it is supported by the full weight of combat power of the unit of which it is a part and overwhelming force is likely to be co-ordinated against him.

SECTION II – DEFENSIVE ACTIVITIES

Defence

5.16. Defence as the ground holding tactical activity is described in detail in ATP-3.2.1.1 – *Conduct of Land Tactical Activities* Chapter 3.

5.17. The concealment and protection afforded by the UE confer considerable advantages on the defender. The UE may canalize enemy armour into EA where it becomes vulnerable to ambush or destruction from flank fire and may fragment his armour and infantry by the need for repeated neutralization or clearance operations. The judicious use of an UE by the defender, in conjunction with other obstacles, can block and delay the enemy advance by forcing him to undertake lengthy and costly clearing operations.

5.18. Although concealment and cover will be plentiful, observation will be limited. Special attention has to be given to achieve mutual support and all-round defence to counter enemy infiltration. The nature of the terrain usually leads to close-quarter combat. Defensive measures may include the barricading of streets and the employment of short-range direct fire weapons.

5.19. Defenders can make use of the **subterranean** environment for the movement of personnel and reinforcement. Consideration has to be given to denying these areas the enemy if they are not to be used, while also being mindful of possible unintended damage to the infrastructure, building collapse, flooding, etc., resulting from the use of weapon systems/munitions. They also provide ready-made LOCs for the movement of supplies and evacuation of casualties, and provide places to cache supplies for forward companies.

5.20. The defender's detailed knowledge of the terrain permits him to avoid areas that are likely to be **fire hazards**. All cities are vulnerable to fire, especially those with many wooden buildings. The defender should pay special attention to the fire hazards of petroleum stores, gas tanks and electricity stations, but also large industrial areas. All defensive positions should have firefighting materials and evacuation plans.

5.21. **Stay-behind actions** can be used as a part of defensive or delay operation. There are two types of stay-behind operations:

a. **Unplanned**. An unplanned stay-behind operation is one in which a unit finds itself cut off from other friendly elements for an indefinite time without specific planning or targets and must rely on its organic assets.

b. **Deliberate**. A deliberate stay-behind operation is one in which a unit plans to operate in an enemy-controlled area as a separate and cohesive element for a certain amount of time or until a specified event occurs. A deliberate stay-behind operation requires extensive planning. Reinforced sniper teams with close protection could be used. Squads, sections and even platoons can conduct this type of operation as part of a larger operation. The terrain and the presence of civilians will dictate how, where and in what strength it is possible to conduct stay-behind operations.

Delay

5.22. If a delay cannot be avoided in an UE, for example because forced by the enemy’s quick advance, it is conducted along the principles described in ATP-3.2.1.1 – *Conduct of Land Tactical Activities*.

SECTION III – STABILITY ACTIVITIES

5.23. Stability activities as described in ATP-3.2.1.1 – *Conduct of Land Tactical Activities* or other related documents are focussed on the people and will therefore as such inevitably be concentrated in UEs where a large proportion of the civilian population is located.

SECTION IV – ENABLING ACTIVITIES

Reconnaissance

5.24. High civilian population densities makes covert reconnaissance in an UE difficult.

5.25. Reconnaissance in an UE may in particular include the collection of data of:

- locations of government offices, political party headquarters and NGO;
- compositions and dispositions of regional and local military, paramilitary, and law enforcement and public safety organizations;
- locations of police stations, armouries or barracks, encampments, weapon holding areas and staging areas;
- factions, key leaders, locations, compositions, and dispositions of known friendly, neutral, and belligerent elements. Include recent trends in public opinion, intensity levels of current and past disturbances and collateral damage if required;
- description of uniforms and insignia and capabilities of vehicles and equipment (both enemy and friendly);
- locations of power generation and transformer facilities, water treatment plants and food distribution points;
- locations of communications networks and media outlets.

March

5.26. The movement of all types of vehicles will be generally restricted to existing roads and streets, which makes routes easy to anticipate and interdict. They may well be obstructed by rubble and man-made obstacles. Vehicle routes must be cleared of EO especially of mines and IEDs and secured by troops on the ground to ensure freedom of movement; this is especially important where the use of unarmoured vehicles cannot be avoided. When using jammers, the shading effect in UE must be taken into account, for example by adjusting the distances between the elements to be protected.

5.27. When the situation allows, infantry should avoid movement along streets and endeavour to move through buildings to provide cover and protection, using mouse holes where necessary.

Crossing/breaching obstacles

5.28. Intelligence is critical when conducting breaching operations in restricted UEs. The commander must identify how the enemy is using the terrain (e.g. with the aim of leading friendly forces in an EA) to minimize the risk of surprise. Supporting engineer/EOD units or specialists used to assess obstacles should be able to recommend methods to reduce the effectiveness of obstacles.

Link-up

5.29. During operations in UEs link-up will be a common and regular task due to the decentralized manoeuvres of small units. The very likely presence of civilians and adversaries, short distances and difficulty of manoeuvring and finding the way will trouble the units involved in the link-up. Well-planned and rehearsed standards and methods as well as good mapping are essential for a successful link-up.

Withdrawal

5.30. Consideration may be given to the use of the subterranean environment.

ANNEX A – TYPES OF URBAN TERRAIN ZONES

Overview

A01. The general definitions of UEs by civilian population size are:

- megalopolis - (civilian population over 10 million);
- metropolis - (civilian population between 1 – 10 million);
- city - (civilian population 100k – 1 million; perimeter 25km +);
- town or small city - (civilian population 3 – 100k);
- village - (civilian population less than 3k).

A02. Types of UEs are:

- historical centre/ old town;
- financial/business centre;
- heavy industry;
- light industry;
- high density residential (both vertical and horizontal);
- low density residential (may include villages);
- slum/shanty (may include refugee camps).
- subterranean.

Transportation terminals represent a special form of infrastructure, often close to, sometimes inside the UEs.

Historical centre/old town

A03. Old towns and historical centres may house civil services within old historical buildings. Many of these centres will be connected with a myriad of streets and alleyways. Characteristics are:

- predominance of masonry construction, providing good ballistic protection, with little or no street pattern and multiple thoroughfares;
- total area is small;
- little/no parking areas;
- often complex surface design and occasionally unmapped sub surface areas;
- tourist facilities, centres for entertainment;
- significant presence of cultural property (movable and immovable).

Function	civil
Skyline	medium
Visibility	medium
Density	high
Infrastructure	medium
Day/Night activities	day, evening for entertainment
Building materials	frameless masonry (stone), timber and steel frame
Area	global
Population density	low

Financial/business centre

A04. Financial and business centres are primarily manufactured from modern materials. Characteristics are:

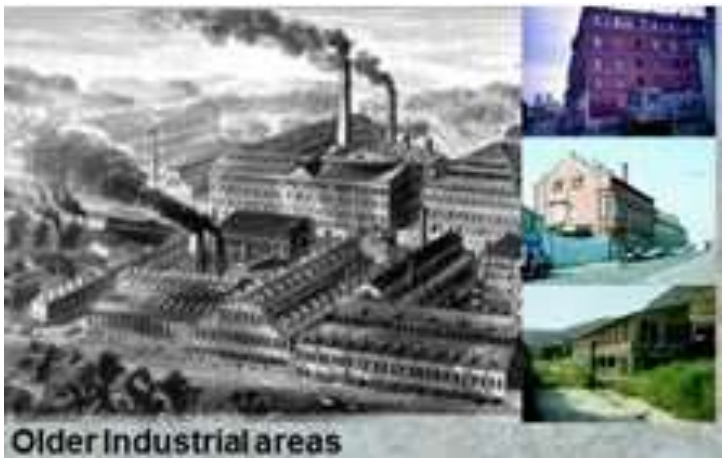
- predominance of modern construction, glass and steel, high rise, producing urban canyons;
- total area is small;
- underground and multi-story parking areas;
- often located immediately adjoining city centres;
- little ballistic protection, although structures extremely durable;
- high population during the working day.

Function	commerce
Skyline	medium
Visibility	low
Density	medium
Infrastructure	good
Day/Night activities	day
Building materials	steel, glass
Area	global
Population density	day - high night - low

Industrial areas

A05. **Older industrial areas** are primarily manufacturing buildings and sites that are established before World War II with a strong linkage to railroad lines. Characteristics are:

- predominance of masonry construction, two or more floors in height, with low ceilings and small sites relative to building size;
- total area is small;
- little/no parking areas;
- often located immediately adjoining residential areas (near city centre of medium size towns and larger cities) to facilitate walking from home to work.



A06. **Newer industrial areas** were established from after World War II to present day and are based on the use of transport by trucks. Characteristics are:

- located in subterranean areas;
- single floor, flat-roofed plants;
- total area is large;
- modern infrastructure/parking facilities.

	Older Industrial Areas	**Newer Industrial Area**
Function	Large and small-scale manufacturing, assembly, warehousing and distribution	
Skyline	medium	low
Visibility	medium	high
Density	medium	low
Infrastructure	medium	good
Day/Night activities	day	Day, sometimes night
Building materials	frameless masonry	frameless pre-fabricated, tilt-up
Area	global	global
Population density	medium	Low/medium

A07. **Heavy industrial areas** are normally older industrial areas that are well established. They are primarily involved in heavy manufacturing, power generation and heavy facilities such as waste disposal. Characteristics are:

- predominance of masonry and steel construction, multi-floors, vary widely in size;
- hazardous material present;
- large parking areas;
- often located immediately adjoining transportation terminals;
- seldom located adjacent residential areas.

A08. **Light industrial areas** are out of town shopping areas. Characteristics are:

- predominantly of cheap material, limited ballistic protection, larger open areas both internal and surrounding;
- large parking areas;
- total area is small;
- often located immediately adjoining residential areas to facilitate convenience to population.

High density residential

A09. High residential areas could be divided into horizontal and vertical areas. Characteristics of high density residential are:

- predominantly of cheap material, limited ballistic protection, larger open areas both internal and surrounding;
- large parking areas;
- total area is small.

High horizontal residential area

High vertical residential area

	Horizontal	**Vertical**
Function	housing	housing
Skyline	medium	high
Visibility	low	medium
Density	high	high
Infrastructure	medium	medium
Day/Night activities	day/night	day/night
Building materials	masonry	Steel frame
Area	western	global
Population density	high	high

Low density residential

A10. Villages in the perimeter of UE generally fall into this bracket although in many less well developed countries they may have the characteristics of slum/shanties. Facilities such as religious centres, schools and shops will generally be central. Characteristics are:

- detached and semi-detached housing;
- garaging and out housing (sheds);
- off street parking;
- gardens, hedges and fences;
- interspersed with small shops, schools and other facilities;
- parkland and open spaces will be prevalent.

Function	residential
Skyline	low
Visibility	good
Density	medium
Infrastructure	medium
Day/Night activities	day, limited night
Building materials	frameless masonry, light frame, t frame, concrete Adobe and mud in developing world
Area	global
Population density	medium

Slums/shanties

A11. A slum as defined by the United Nations (UN) is a run-down area of a city characterized by substandard housing, squalor and lacks security from law enforcement or other forces. Characteristics are:

- insecure tenure;
- substandard housing and overcrowding;
- inadequate or no infrastructure including sanitation;
- inadequate access to safe water.

A12. Housing structures. Housing may be an overcrowded, rundown, ill-maintained tenement building. Housing inside many slums also takes the form of makeshift shanties, shacks, hutments, and brick and mortar single room spaces constructed from whatever material is available (lumber, cloth, vegetation) depending on how much money is available to spend.

A13. Refugee camps are temporary settlements built to receive refugees. Usually they are built and run by a government, the UN or international organization.

A14. Risks are:

- disease/malnutrition;
- vulnerability to natural und unnatural hazards;
- unemployment and informal economy;
- crime/violence.

Subterranean

A15. Subterranean areas appear throughout the urban landscape. Examples range from basements within residential structures to subways, parking areas, sewer systems, catacombs (burial site) and canal systems. These areas are mainly man made but naturally occurring voids such as caves and tunnels should not be discounted. Characteristics are:

- complex, confined, confused;
- dark when power is not available;
- weapon effects, such as blast, are enhanced;
- often connecting one urban terrain type with another and into transportation terminals.

Hazards are:

- toxic chemical and biological gasses;
- conduits for power and waste utilities;
- neutralized technology such as satellite navigation;
- flooding/flash floods;
- collapse and entrapment.

Transportation terminals

A16. Any location where freight and passengers either originates, terminates or is handed in the transportation process. Terminals are central and intermediate locations in the movements of passengers and freight. Three major attributes are linked with the importance and the performance of transport terminals:

- location;
- accessibility;
- infrastructure.

A17. Major components of **airports** are:

- airfields;
- terminals;
- parking lots, multi-story parking garages.

Airports are normally sited at the periphery of urban areas.

A18. Configurations of **train stations** are:

- basic configuration with one or more platforms constructed alongside a line of railway;
- stations in tunnels;
- stations with platforms on more than one level.

A19. There are basically two types of **ports**:

- mainland ports are linked to a major river, which is often serving a vast hinterland;
- seaports have direct access to the sea. They may be linked to major rivers when located at the mouth of the river.

Major ports mainly fall within the heavy industry, but not exclusively, while smaller harbours and marinas can be found in any littoral urban environment.

Co-located with harbours are often energy facilities and logistical hubs.

ANNEX B – COORDINATING TOOLS, MEASURES AND SYMBOLS

General

B01. Principal BSM tools are described in ATP-3.2.1 – *Conduct of Land Tactical Operations* and ATP-3.2.1.1 – *Conduct of Land Tactical Activities*. However, due to complex infrastructure and limited sight orientation and target identification is an increased challenge in an UE. More dispersed units and the expected close combat enhances the risk of friendly fire significantly. Additional simple tools to facilitate communication and coordination and mitigate the risk in UEs are necessary.

Urban grid system

B02. Identifying or referring to a particular piece of ground in urban terrain using a six or eight figure grid reference can prove imprecise and slow. It is therefore often impracticable. An urban grid system (sometimes referred to as a spot map) should therefore be used to reference friendly location, the location of flanking units or persons and those of enemies, adversaries, civilians and other significant sites or locations.

B03. Urban grid systems are based on the following features:

- high resolution mapping or aerial photography should be divided into alphabetical sectors, which must be clearly recognizable;
- individual buildings within the sectors are identified by numerical target reference points (TRP); and
- main routes are identified by numerical spots.

All ground forces, fire support elements and aircrews should operate off the same urban grid system[45] and these should be refreshed regularly to preserve operations security (OPSEC).[46]

B04. The urban grid system is used to identify adversary and friendly positions. Avoid over-targeting, i.e. numbering every building in the UE should be avoided by concentration on numbering the buildings in the expected objective area. Buildings without numbering may be identified by using TRP together with direction, approximate distance and description of the target.

[45] To be noted that for indirect fire the urban grid system has to be convert into a UTM grid.
[46] See also ATP-3.3.2.1 *Tactics, Techniques and Procedures for Close Air Support and Air Interdiction* for more detail.

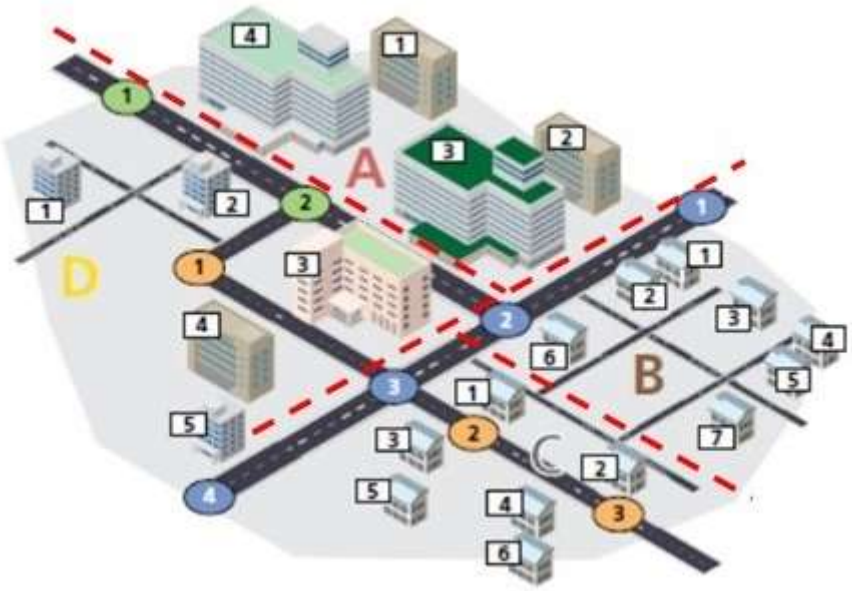


Figure B-1 Urban grid system

Target identification

B05. For precise target indication in buildings, for example to request fire support, a more detailed system based on identification of windows or doors has to be used.

B06. The target identification is based on the following features:

- the number of the building (urban grid system);
- the number of floors within the building (identified by window rows); and
- the number of windows at the specific floor.

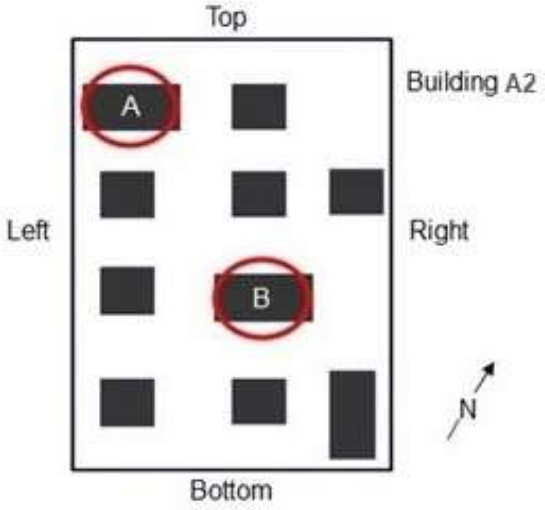


Figure B-2: Urban target identification

B07. Window ‘A’ can be indicated using one of the following alternative references:

a. Building A2, south side, target top 1, left 1 (first floor counted from top, first window counted from left) or,

b. Building A2, south side, target top 1, right 2 (first floor counted from top, second window counted from right) or,

c. Building A2, south side, target bottom 4, left 1 (fourth floor counted from bottom, first window counted from left) or,

d. Building A2, south side, target bottom 4, right 2 (fourth floor counted from bottom, second window counted from right).

Using the same system window ‘B’ can be identified:

a. Building A2, south side, target top 3, left 2 (third floor counted from top, first window counted from right) or,

b. Building A2, south side, target top 3, right 1 (first floor counted from top, first window counted from left) or,

c. Building A2, south side, target bottom 2, left 2 (second floor counted from bottom, second window counted from left) or,

d. Building A2, south side, target bottom 2, right 1 (second floor counted from bottom, first window counted from right).

If the observing unit has to indicate a target window to an air asset, it is preferable to use the top down indication of stories. See CAS later in this publication.

Marking buildings

B08. Rooms need to be marked as having been cleared, or buildings identified as containing friendly forces. A variety of means and symbols can be used within units, such as chalk, panel markers, and chemical lights. Infrared chemical lights have proved very effective in marking objectives, particularly when the enemy or insurgent forces lack similar night vision aids. However, this may not be effective in a combat environment with near-peer adversaries. A marking procedure will identify the progress made by friendly troops in clearing their sector.

B09. Panel markers on rooftops will indicate to CAS the forward line of own troops (FLOT). They can also be used to indicate progress to ground troops (hanging them from window) and to indicate a link-up point for reserves or a passage of lines.

B10. **External marking** of buildings. During combat, there will be a need to mark buildings. This is to show which buildings have been cleared, the location of entry points, the FLOT, the location of casualties and EO:

colour	meaning
red	when Facing Forwards – FLOT when Facing Rearwards – Entry Point, Building Not Clear
yellow	medical assistance/ MEDEVAC/CASEVAC required
green	entry point/building clear
blue	EO/obstacle in building. engineers/EOD required

Figure B-3: Marking buildings

Any combination could be found at the entry point. However, it should be noted that only red or green could be placed rearwards at any one time. Markings at night are two appropriately coloured glow sticks on a 2m length of masking tape hung out the window or door.

B11. **Internal building markings**. The following are internal marking. Care must be taken to remove once no longer relevant.

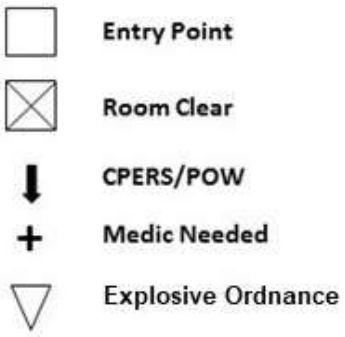


Figure B-4: Internal building markings

Marking EO

B12. EO are to be marked as soon as they are encountered in an effort to warn troops and prevent casualties. Signs should, whenever possible, be fixed above ground and in a prominent place to avoid confusion in a distance and manner that does not disturb the EO. Soldiers have to be aware of them and know their meaning. Policy and method of marking will be decided by the appropriate commander[47].

[47] No standard exists for the marking of all types of EOs. Most important is that the marking is flashy. The NATO mine triangle - red marking mine, blue triangle, blue flag or be displayed as a blue marking for EO) serves as an orientation.

After the marking of the EO it is necessary to create an EO incident report.[48]

Marking casualties

B13. The marking of casualty collection points is the first step in any casualty evacuation. Inside a building, a yellow marker should be positioned at the point of entry to indicate a casualty in a particular building. This indicates to the reserve or medics that casualties have been taken that require treatment and evacuation. Under the NATO marking system a safe route will be indicated by a green marker at the point of entry to the building.

Selection of internationally agreed symbols

B14. Internationally agreed symbols may well be seen on structures within the UE. Below are examples, with description, for these symbols.

B15. In armed conflict, the Red Cross, the Red Crescent and the Red Crystal are visible signs of the protection afforded to medical and religious personnel and medical units and transports under the Geneva Conventions and their additional protocols[49]. Improper use is prohibited. It is also prohibited to deliberately misuse in armed conflict other internationally recognised emblems, signs or signals including the flag of truce, the protective emblems of cultural property and the emblem of the UN.

Following third Additional Protocol, the Red Shield of David, which is the emblem of Magen David Abdom, the national society of Israel, can be used, for indicative purpose inside the national Israeli territory. The Red Shield of David incorporated inside the Red Crystal can be used outside the national Israeli territory for indicative purpose only.

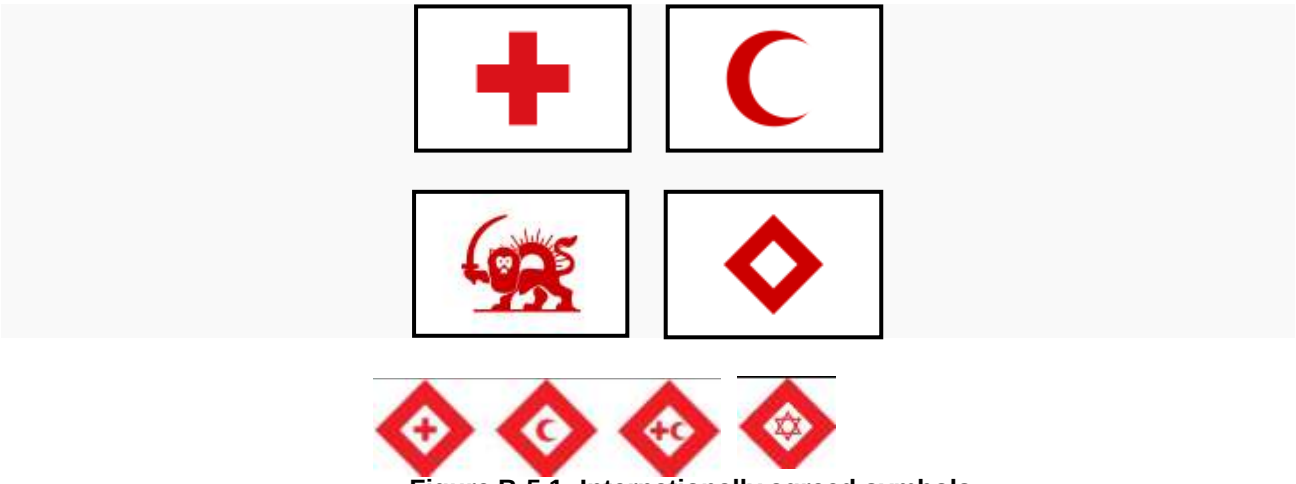


Figure B-5.1: Internationally agreed symbols

[48] See AEODP-06 - *Explosive ordnance disposal reports and messages*.

[49] The Red Lion with Sun symbol was used by Iran from 1924 until 1980 when the country declared its intention to use the Red Crescent instead. However, the country maintains its right to return to the Red Lion with Sun emblem. Therefore, this symbol is still recognized as a protective sign with equal status to the Red Cross, Red Crescent and Red Crystal. National Societies which decide to use the Red Crystal can incorporate inside the Crystal, only for indicative purpose, the emblem of the Red Cross, the Red Crescent or the Red Lion with Sun.

B16. **Civil defence**. A blue triangle on a circular orange background is the international distinctive sign of civil defence. It is used to mark the personnel and objects of civil defence organisations.

Figure B-5.2: Internationally agreed symbols

B17. **Hospital.** An oblique red band on a white ground to mark hospitals and safety zones.

Figure B-5.3: Internationally agreed symbols

B18. **White flag.** Used to designate unarmed parliamentarians (negotiators, along with their flag bearer and optional drummer) asking for a truce or ceasefire, or to symbolise surrender.

Figure B-5.4: Internationally agreed symbols

B19. **UN flag.** The emblem of the UN as well as the letters "UN"; to be used to mark the personnel and material of UN peacekeeping missions.

Figure B-5.5: Internationally agreed symbols

B20. **Cultural property.** Used to mark movable or immovable property of great importance to the cultural heritage of every people (Fig. B-5.6).

The triple use of that sign (Fig. B-5.7) to mark cultural property under special protection, including refuges intended to shelter movable cultural property (e.g.: paintings, sculptures, texts) and immovable cultural property of very great importance.

The symbol with the red border (Fig. B-5.8) marks cultural property under “Enhanced Protection” due to their greatest importance for humanity. (The list of cultural property under Enhanced Protection can be obtained from UNESCO website.)

Figure B-5.6

Figure B-5.7

Figure B-5.8: Internationally agreed symbols

B21. Special sign for works and installations containing dangerous materials (dams, dikes and nuclear electrical generating stations); consisting of three bright orange circles placed on the same axis.

Figure B-5.9: Internationally agreed symbols

B22. The letters "PG" or "PW" to mark a prisoner of war camp and the letters "IC" to mark an internment camp for civilians.

Figure B-5.10: Internationally agreed symbols

INTENTIONALLY BLANK

ANNEX C – WEAPON USAGE AND EFFECTS

General

C01. The characteristics and nature of combat in UEs affect the employment and results of weapons. The following factors should be considered:

a. Abiding the LOAC and relevant ROE commanders must verify targets and should cancel, suspend or re-plan attacks if they would breach the proportionality principle and cause excessive collateral damage.

b. Notwithstanding the practical challenges of combat in UEs, the LOAC and other applicable legal obligations on the use of force remain unchanged and must be fulfilled at all times. In particular, since military objectives are collocated to or intermingled with civilians and civilian objects, it is imperative for the protection of the civilian population that the proportionality assessment preceding the use of force be conducted with utmost care, given the increased risk that the attack may cause excessive incidental civilian harm.

c. The proximity of civilians and/or civilian objects to targets increases the likelihood and extent of collateral damage. This must be thoroughly considered in the choice of fires to be deployed. The use of explosive weapons with a wide impact area should be avoided in urban environments as far as the tactical situation permits.

d. The interdependency between critical civilian infrastructures such as (waste) water treatment plants, power stations, hospitals etc. providing essential services to the population increases the likelihood and extent of indirect (‘‘reverberating’’) effects of fires, creating a domino effect that may lead to damage of critical infrastructures and the disruption of essential services far beyond the target.

e. Building types and their construction materials must be considered when choosing weapon systems. MILENG advise can help in providing the battle damage assessment and feed the targeting cycle with the proper information about the infrastructure characteristics against the weapons systems.

f. Hard, smooth, flat surfaces are prevalent in the UE. Rarely do rounds impact perpendicular to surfaces but at an angle. This reduces the effect of a round and increases the threat of ricochets. This tendency means that some impact-fused explosive rounds may not detonate.

g. Engagement ranges are close. Studies and historical analyses have shown that only 5% of targets are more than 100m away. About 90% of targets are located 50m or less from the identifying soldier. Minimum arming ranges and troop safety from back blast or fragmentation effects have to be considered.

h. Owing to the complexity of the terrain fleeting targets will be the norm. It requires a short target acquisition and engagement cycle.

i. Depression and elevation angles limit some direct fire weapons. Tall buildings form deep canyons that create dead space, which makes the use of indirect fires difficult.

j. Target identification and acquisition is severely impeded by smoke from burning buildings, dust from explosions, shadows from tall buildings, and the lack of light penetrating inner rooms.

k. The risks from friendly fire, ricochets, and fratricide have to be considered during the planning phase of operations and control measures continually adjusted to lower these risks. Progress of friendly forces should be clearly marked to avoid the potential for fratricide, collateral damage and involvement of civilians.

l. Modern engineering and design improvements mean that most large buildings constructed since the World War II are resilient to the blast effects of bomb and artillery attack. Even though modern buildings may burn easily, they often retain their structural integrity and remain standing. Once high-rise buildings burn out, they still may be useful for combat purpose.

m. Historical analyses also proved that a ruined building (rubble) offers better protection to troops than an integral building. Rubble has a greater capacity to absorb the effects of rockets and HE rounds.

Small arms

C02. Riflemen must hit small, fleeting targets from bunker apertures, windows, and loopholes. This requires pinpoint accuracy with weapons fired both on single shot and the semi- automatic mode.

C03. The penetration that can be achieved with rifle munition depends on the range to the target and the type of material being engaged. Its effect against exterior walls of brick or concrete will be limited unless significant numbers of rounds are fired. Inside buildings lightly constructed interior walls and furniture are likely to be penetrated. These effects should be considered when firing at enemy positions and when balancing the risk to friendly forces in the area.

C04. Medium and heavy machine guns can be very effective as they can penetrate structures. In offensive operations they are best suited to the direct fire support role. Tracers from both types of machine gun can start fires.

C05. Snipers remain combat multipliers within the UE, however due to the limitations of observed range, their effectiveness is equally reduced. Additionally, individual riflemen equipped with magnified sights enhance the ability to identify the threat.

C06. As long as there is no immediate threat to any person’s physical integrity, shotguns may be used to breach doors.

Grenades

C07. Hand grenades are used extensively during combat in UEs. Smoke grenades are used for screening, signalling and deception. Grenades are essential for assaulting and clearing buildings.

C08. Particular attention must be taken when considering the effects of hand grenades on buildings, in order to avoid collateral damage. The use of stun grenade mitigates this risk.

C09. Grenade launchers, which significantly reduce the vulnerability of the soldier and increases the range of the effect, in comparison to the use of hand thrown grenades.

Anti-tank systems

C10. **General**. Due to the general terrain characteristics in the UE the very short range anti-tank (VSRAT) and short range anti-tank (SRAT) systems seem to be the most suitable, although in some situations the medium range anti-tank (MRAT) system can be used. These systems must be complementary to each other and other weapon systems used.

C11. **General deployment rules**

- When firing anti-tank weapon systems in an UE obstacles in the flight trajectories must be taken into consideration.
- On weapons with selectable attack modes direct attack may be the most appropriate attack mode due to the urban clutter.
- **Confined space**. Firing anti-tank weapons from enclosed spaces is possible, but specific weapon characteristics must be taken into account. Modern (V)SRAT and MRAT systems are in general capable to be fired from small enclosures. This gives commanders on the ground more opportunities to employ these weapons.
- **Operational use.** Commanders have to keep in mind that based upon the capabilities and effects of these kinds of weapons, they can form an alternative for other means like tanks and artillery, especially where ROE influence the use of these heavy assets. These weapons may be employed very effectively in UEs.

C12. **Alternate warhead**

- Anti-structure dual warhead munition (initial charge and follow-on charge) allow detonation beyond the breach. These warheads are effective against enemy in UEs.
- Enhanced blast warheads, alternatively known as thermo-baric rounds, based upon fuel air or equal developments are very effective against urban defensive positions.
- Training rounds for tanks are excellent for punching holes and breaching walls.

C13. **Wire guided systems**. In UEs these systems primary role is to defeat main battle tanks and other armoured combat vehicles. It has a limited breaching capability against bunkers, buildings, and other fortified targets commonly found during operations in UEs.

Enhanced blast weapon systems

C14. **General.** Enhanced blast weapons (EBW) are those that rely primarily on blast to inflict damage, rather than explosively driven metal projectiles, fragments or shape-charges.

C15. Blast weapons are characterized by the production of a powerful fireball together with a relatively long duration pressure wave. The fireball, and its associated dust storm, will damage exposed skin and eyes over a wider radius than the blast effect, but most of the physical damage will be caused by the heave and push of the blast wave that may collapse brick or block built structures and cause internal bodily injuries. Such weapons are particularly effective when used against dismounted troops dug in or occupying fortified positions/buildings. Confined spaces will enhance the blast effect and, unlike fragments, blast can travel around corners and down passages/tunnels. Since blast pressure falls off rapidly in the open, much smaller minimum safety distances are possible.

C16. **Protection against EBW effects**. The primary function of EBW is to neutralize or destroy fortified positions and their smaller safety distances enable assaulting troops to close more effectively with the objective. The lethality of a blast wave can be reduced significantly by using materials that absorb its energy or by physically blocking its path. The ultimate protection is to isolate personnel from the blast wave altogether, but this may not be practicable. Furthermore, a balance has to be struck between providing adequate protection and not hampering troops' ability to fight or to protect themselves against other threats. The first step is to prevent the munition/blast wave from entering a structure by providing a physical barrier. Failing that, the next step is to minimize the damage and injury caused by a blast munition within a structure by weakening and isolating its effect.

C17. **Use of EBW in defensive operations**. EBW will have a major impact on the way NATO and other coalition forces conduct operations in UEs. As a result, there is a need to examine how to use EBW to conduct offensive countermeasures during defensive operations.

C18. When considering the proposed defensive measures below it has to be borne in mind that defenders will still need to protect themselves against the threats posed by conventional weapons. The defensive measure that provides complete protection against EBW is useless if it leaves troops exposed to other conventional threats.

C19. The structural defensive measures can be subdivided into 4 areas:

- venting;
- premature detonation of the warhead;
- building selection;
- building preparation.

Use of tanks

C20. **General**. The powerful, high velocity main tank gun provides the infantry soldier with a key requirement for success in UEs - heavy direct fire support. The tank is one of the most effective weapons against structures. The primary role of the tank gun during operations in UEs is to provide mobile, armoured and heavy direct fire against buildings and strong points that are identified as targets. The wall and fortification breaching effects of the tank gun are major capabilities.

C21. **Limitations**. Limitations of elevation, depression and traverse will reduce the capability of tanks to engage some targets in the UE. Where possible, tanks should take advantage of parks and gardens, which offer the best fields of fire. The weight of tanks may cause collapse of cellars, drains and underground systems and therefore routes and firing positions have to be recced with care.

C22. **Firing angles**. Tank guns produce their best urban target effects when fired perpendicular to the hard surface.

C23. **Munition**. High explosive squash head (HESH) is the most effective munition against buildings causing considerable structural damage and casualties.

C24. **Employment**. Tanks are best suited to tasks within a covering force, or for direct fire support. In these roles they can make maximum use of their firepower and mobility without exposure to the threat. Tank heavy forces could be at a severe disadvantage during fighting in UEs. Other considerations are the following:

- Tanks need infantry on the ground to provide security in UE and to designate targets. Against targets protected by structures, tanks should be escorted forward to the most covered location that provides a clear shot. On the spot instructions by the local infantry commander are essential to ensure that the tank's fire is accurate and its exposure is limited.
- When the tank main gun fires, it creates a large fireball and smoke cloud. In the confines of an UE, dirt and masonry dust are also picked up and add to this cloud. The target is further obscured by the smoke and dust of the explosion. Depending on the local conditions, this obscuration could last as long as two or three minutes. Infantry can use this period to reposition or advance unseen by the enemy. Caution has to be exercised because the enemy might also move.
- Tank guns create an overpressure and noise hazard to exposed infantrymen.
- Tanks are equipped with powerful thermal sights that can be used to detect enemy personnel and weapons that are hidden in shadows and behind openings. Dust, fires, and thick smoke significantly degrade these sights.
- When using turret mounted grenade launchers, burning particles from phosphorous can easily start uncontrolled fires and are hazardous to dismounted infantry near the tank. The tank commander and the local infantry commander should coordinate when and under what conditions these launchers can be used.

Indirect fire systems

C25. High explosive (HE) shells, with impact fuse or delay fuse (fuses will often fail to activate over the short ranges employed), will have a devastating effect against masonry constructions or field fortifications.

- Weapons of at least 155 mm are necessary when attacking buildings with reinforced concrete, stone or brick walls and even with heavy artillery, large expenditures of munition are required to knock down buildings of any size. The use of 105 mm guns against buildings should be considered when the buildings are 'soft' or where minimizing collateral damage is a factor.
- HE will have a significant effect on rooftop operations, air defence or snipers mounted on high buildings and troops in the open.
- When considering the use of smoke, it must be remembered that phosphorous is liable to set buildings on fire.
- HE airburst will minimise damage to urban structures.

C26. Limitations to the use of artillery in UEs pertain to the LOAC obligation of choosing methods and means that minimize harm to civilians and civilian objects and, when choosing to use artillery, taking all feasible measures to mitigate its effects on civilians and civilian objects. Within these limitations, indirect artillery has a significant role in UEs.

C27. **Direct fire**. The most likely use of artillery in the direct fire role is to fire against strong points within the UE, notably those that tanks cannot engage because of their limited elevation. Unlike recoilless weapons, artillery pieces do not lead to problems associated with concussion and back blast. Towed equipment is capable of being manhandled across rubble or other obstacles, and into buildings, in relative silence.

C28. **Positioning of observation post for JFS personnel**. The restrictions on observation imposed within UEs, will severely stretch fire support observation resources. Commanders will have to include use of airborne OPs, reconnaissance troops and UAS in their observation plans.

Aerial systems

C29. Specific targets are hard to distinguish from the air. Targets are hard to locate and identify, enemy and friendly forces could be intermingled. Enemy and friendly forces may only be separated by a single building; accurate delivery of ordnance is required. Marking panels, lights electronic beacons, smoke, or some other positive identification of friendly forces is needed.

C30. Enemy short-range air defence weapons are difficult to suppress presenting a particular threat to rotary wing assets operating within an UE.

C31. To avoid collateral damage in UEs, aerial Systems often use general-purpose bombs[50], mostly upgraded to low collateral bombs (LCB) with laser or INSS guidance. High dive angle bomb runs increase accuracy and penetration but

[50] Pending national standard, often 500lbs and below.

also increase the aircraft's exposure to anti- aircraft weapons. Low-dive angle bomb runs can be used to get bombs into upper stories. Penetration is not good with high-drag bombs. Sometimes aerial bombs pass completely through light clad buildings and explode on the outside.

C32. Aerial rockets and cannon are only moderately effective in UEs since rockets lack the accuracy to concentrate their effects. The cannon rounds penetrate only slightly better than the 12.7mm calibre round; armour piercing (AP) rounds can ricochet badly; and tracers can start fires.

C33. The use of precision-guided munitions (PGMs) by CAS aircraft is often preferred when supported ground operations intended to destroy high-payoff targets in UEs. PGMs allow the commander to limit collateral damage while creating the desired effects and mitigating adverse effects.

C34. LASER-guided systems provide additional capabilities, but also have distinct limitations. In fact, environmental conditions can affect LASER designators and seeker head performance (consider low clouds and fog, smoke, haze, snow and rain, solar saturation, and other visually limiting phenomena).

C35. Inertial navigation system or global navigation satellite systems (like direct attack munition) have a high precision, can be deployed rapidly and minimize collateral damage. An advantage to general-purpose bombs is the angel of impact. A high angle impact limits the elevation error of the target grid (e.g. roof of a building).

C36. Through the process of weaponeering[51] the weapon effect on the ground are optimized by minimizing collateral damage and the forces necessary for the desired results. The required number and type of weapons, aircraft and fuze settings will be estimated. The fuzing of a weapon is important for the right weapon effect (thermal, blast, cratering, fragmentation and penetration). Modern weapons have mostly a cockpit selectable fuze.

CBRN

C37. The creation of CBRN effects by an enemy in an UE is likely to have a catastrophic effect on the civilian population who will have little defence against this threat. Indeed, the physical effects of these weapons are likely to be enhanced in restricted spaces where they are less likely to be dissipated by ultraviolet rays or wind. The threat of release in congested UEs could potentially cause a mass casualty situation. Commanders must manage with the aftermath, including a requirement to aid in the surveying of contamination from the full range of CBRN threat agents. There is potential for mass panic to arise when the threat of release is prevalent, regardless of the actual degree of risk. It will not take much for a civilian reaction to escalate and there is a consequent requirement for proactive messaging and a robust public and internal narrative. This must be established as a part of the threat/risk assessment made as part

[51] See AJP-3.3 – *Allied Joint Doctrine for Air and Space Operations* and ATP-3.3.2.1 – *Tactics, Techniques and Procedures for Close Air Support and Air Interdiction* for more detail.

of an estimate process. The risk and responses to public disorder should be considered during planning.

C38. **Toxic industrial materials (TIM).** Where dangerous chemicals and industrial waste are co-located with high-density residential areas, there is a threat of toxic or other hazardous material accidental spillage or deliberate use as a weapon. Such substances include chemical, biological and radiological agents, and in areas where these types of hazards may exist, appropriate warnings should be given to troops and contingency plans drawn up in case of contamination. Consideration should be given to the deployment of specialist troops if the presence of hazardous substances is identified.

Non-lethal weapons

C39. Where adversaries are operating in close proximity to civilians or a sensitive location that complicates targeting, non-lethal weapons (NLW) or techniques may be required to engage targets or force them into the open. NLWs examples include the use of directed energy (e.g., millimetre wave, high-power microwave, or lasers for counter personnel or counter materiel applications), high volume noise, negotiation by loud hailer or use of intermediaries. The employment of riot control agents (e.g. CS gas) as a means and method of warfare is prohibited under the LOAC. Such agents can only be used in law enforcement type tasks.

C40. NLWs should not be thought of as a separate unique capability. NLWs represent additional capabilities for use in a military commanders' graduated use of force to deter, defend or attack an opponent.

Weapon systems in subterranean environment

C41. Confined spaces will amplify the sounds of weapon systems to a dangerous level, especially grenades. Grenades and mines exploding in a sewer or tunnel can have adverse effects on friendly troops such as organ damage caused by overpressure and wounds from flying debris. Also, gases found in sewers can be ignited by the blast effects of these munitions. For these reasons, small-arms weapons should be the principal weapon systems employed in tunnels and sewers.

C42. A multitude of hazards has to be considered when using the subterranean environment from toxic and flammable gases to the possible presence of liquid and airborne diseases. Additionally, troops can be affected by feelings of isolation affecting their psychological fitness. Environmental conditions may also change the dynamic of this terrain such as ice/snow melt causing flooding.

C43. Air delivered weapons offer the chance to target subterranean target sets through steep impact angles, delayed fusing and penetration warheads.

LEXICON

Part I – Acronyms and abbreviations

AJP	Allied Joint Publication
AOR	area of responsibility
AP	armour piercing
ATP	Allied Tactical Publication
BDA	battle damage assessment
BSM	battlespace management
C2	command and control
CAS	close air support
CASEVAC	casualty evacuation
CBRN	chemical, biological, radiological and nuclear
C-IED	countering improvised explosive device
CIMIC	civil-military cooperation
CNI	critical national infrastructure
COIN	counter insurgency
CPERS	captured person
CSS	combat service support
EA	engagement area
EBW	enhanced blast weapon
EO	explosive ordnance
EOD	explosive ordnance disposal
EW	electronic warfare
FARP	forward arming and refuelling point
FLOT	forward line of own troops
FSCM	fire support coordination measures
FSG	fire support group
GO	governmental organization
HE	high explosive
HESH	high explosive squash head
HN	host nation
HNS	host nation support
IDP	internally displaced persons
IED	improvised explosive device
IO	international organizations
ISTAR	intelligence, surveillance, target acquisition and reconnaissance

JFS	joint fire support
JIPOE	joint intelligence preparation of the operational environment
JTAC	joint terminal attack controller
LOAC	law of armed conflict
LOC	lines of communication
MEDEVAC	medical evacuation
MILENG	military engineering
MP	military police
MRAT	medium range anti-tank
MSR	main supply routes
MTF	medical treatment facility
NATO	North Atlantic treaty organization
NGO	non-governmental organizations
NLW	non-lethal weapons
OE	operating environment
OPSEC	operations security
PGM	precision-guided munitions
PMESII	political, military, economic, social, information and infrastructure
PO	public order
POC	points of contact
RIP	relief in place
ROE	rules of engagement
SA	situational awareness
SBAMD	surface based air and missile defence
SP	stability policing
SRAT	short range anti-tank
TIM	toxic industrial material
TRP	target reference points
TTP	tactics, techniques and procedures
UAS	unmanned aircraft system
UE	urban environment
UN	United Nations
UXO	unexploded explosive ordnance
VSRAT	very short range anti-tank
WMD	weapons of mass destruction

Part II – Terms and definitions

adversary
A party whose intentions or interests are opposed to those of friendly parties and against which the legal use of armed force may be envisaged.
(NATOTerm)

area of interest
For a given level of command, the area of concern to a commander relative to the objectives of current or planned operations, and which includes the commander's areas of influence, operations or responsibility, and areas adjacent thereto.
(NATOTerm)

asymmetric threat
A threat emanating from the potential use of dissimilar means or methods to circumvent or negate an opponent's strengths while exploiting his weaknesses to obtain a disproportionate result.
(NATOTerm)

attack
To take offensive action against a specified target.
(NATOTerm)

audience
Individual, group, or entity whose perception and interpretation of events and subsequent beliefs and behaviour may contribute to achieving the end state.
(AJP-3.2)

battlespace
The environment, factors and conditions that must be understood to apply combat power, protect a force or complete a mission successfully.
Note: It includes the land, maritime, air and space environments; the enemy and friendly forces present therein; facilities; terrestrial and space weather; health hazards; terrain; the electromagnetic spectrum; and the information environment in the joint operations area and other areas of interest.
(NATOTerm)

breach
To force a passage through an obstacle or fortification.
(NATOTerm)

bypass
To move around an entity or obstacle to maintain momentum.
(NATOTerm)

canalize
To constrain movement to a specific, narrow zone.
(NATOTerm)

civil-military cooperation (CIMIC)
A joint function comprising a set of capabilities integral to supporting the achievement of mission objectives and enabling NATO commands to participate effectively in a broad spectrum of civil-military interaction with diverse non-military actors.
(NATOTerm)

clear
To ensure an area is free of the enemy troops and/or their obstacles.
(This is a new term and definition being processed for NATO agreed status via terminology tracking file 2011-1231)

combat identification
The use of identification measures to reduce friendly fire and increase the operational effectiveness of forces and weapon systems.
(NATOTerm)

combat service support (CSS)
The support provided to combat forces, primarily in the fields of administration and logistics.
Note: Combat service support may include, but is not limited to, administrative services, chaplaincy, civil affairs, financial, legal, medical and health services, military police, supply, maintenance, transportation, construction, acquisition and disposal of real estate, facilities engineering, topographic and geodetic engineering, food services, graves registration, laundry and dry cleaning services, sanitary installations, and property disposal.
(NATOTerm)

combined arms
In land operations, relating to the synchronized or simultaneous application of several arms to achieve an effect on the enemy that is greater than if each arm were used against the enemy in sequence.
(NATOTerm)

command
1. The authority vested in an individual of the armed forces for the direction, coordination and control of military forces.
2. An order given by a commander; that is, the will of the commander expressed for the purpose of bringing about a particular action.
3. A unit, group of units, organization or area under the authority of a single individual.
4. To dominate an area or situation.
5. To exercise command.
(NATOTerm)

component command
A functional component command or environmental component command responsible for the planning and conduct of a maritime, land, air, special or other operation as part of a joint force.
(NATOTerm)

concept of operations
A clear and concise statement of the line of action chosen by a commander in order to accomplish his given mission.
(NATOTerm)

consequence management
Actions taken to maintain or restore essential services and to lessen the effects of natural or man-made disasters.
(NATOTerm)

consolidation of position
Organizing and strengthening a newly captured position so that it can be used against the enemy.
(NATOTerm)

contain
To restrict an entity's freedom of movement to within a specified area.
(NATOTerm)

control
To exert influence over an entity, process, object or area to establish, maintain or prevent a specific situation or event.
(NATOTerm).

control measure
Directive given graphically or orally by a commander to subordinate commands in order to assign responsibilities, coordinate fires and manoeuvre, and control combat operations.
(NATOTerm)

convoy
A group of vehicles organized for the purpose of control and orderly movement with or without escort protection.
(NATOTerm)

counterbattery fire
Fire delivered for the purpose of destroying or neutralizing the enemy's fire support system.
Note: Counterbattery fire can be either proactive or reactive.
(NATOTerm)

covering force
A force operating apart from the main force for the purpose of intercepting, engaging, delaying, disorganizing and deceiving the adversary before he can attack the force covered.
(NATOTerm)

deception
Deliberate measures to mislead targeted decision-makers into behaving in a manner advantageous to the commander's intent.
(NATOTerm)

defeat
To diminish the effectiveness of an enemy or adversary to the extent that he is unable or unwilling to resist or achieve its intent.
(NATOTerm)

delay
To slow an enemy by trading space for time while inflicting maximum damage on them without becoming decisively engaged.
(NATOTerm)

direct fire
Fire directed at a target which is visible to the aimer.
(NATOTerm)

disrupt
To negatively affect a hostile entity’s formation, tempo and/or timetable.
(NATOTerm)

destroy
1. A tactical mission task that physically renders an enemy force combat-ineffective unless it is reconstituted.
   (NATOTerm, Not NATO Agreed)
2. To render a target so damaged that it cannot function as intended nor be restored to a useable condition without being entirely rebuilt.
   (NATOTerm)

doctrine
Fundamental principles by which the military forces guide their actions in support of objectives. It is authoritative but requires judgement in application.
(NATOTerm)

electromagnetic spectrum (EMS)
The entire and orderly distribution of electromagnetic waves according to their frequency or wavelength-
(NATOTerm)

electronic warfare (EW)
Military action that exploits electromagnetic energy to provide situational awareness and create offensive and defensive effects.
(This term and definition modify an existing NATO Agreed term and definition and has been processed for NATO Agreed status via terminology tracking file 2011-1996.)

end state
The political-strategic statement of condition that defines an acceptable concluding situation to be attained at the end of a strategic engagement.
(NATOTerm)

enemy
A party whose actions are hostile and against which the legal use of force is authorized.
(NATOTerm)

evacuate
To remove people, animals or materiel from a place of actual or impending danger.
(NATOTerm)

exploit
To utilize successes or opportunities to maximize advantages or gains.
(NATOTerm)

fire support
The application of fire, coordinated with the manoeuvre of forces, to destroy, neutralize or suppress the enemy.
(NATOTerm)

fire support coordination measure (FSCM)
A measure employed by land or amphibious commanders to facilitate the rapid engagement of targets and simultaneously provide safeguards for friendly forces.
(NATOTerm)

Measures used to reduce fratricide, while permitting the rapid engagement of targets. They can be either restrictive or permissive.
(AAP-38)

fires
The use of weapon systems to create a specific lethal or nonlethal effect on a target.
(NATOTerm – Not NATO agreed)

fix
To prevent any part of a hostile entity from moving from a specified location for a specified period of time.
(NATOTerm)

force protection
All measures and means to minimize the vulnerability of personnel, facilities, equipment and operations to any threat and in all situations, to preserve freedom of action and the operational effectiveness of the force.
(NATOTerm)

formation
Within land forces a military element from brigade level upward.
(ATP-3.2.1, not NATO agreed)

host nation (HN)
A nation which, by agreement:
a. receives forces and materiel of NATO or other nations operating on/from or transiting through its territory;
b. allows materiel and/or NATO organizations to be located on its territory;
c. provides support for these purposes.
(NATOTerm)

hybrid threat
A type of threat that combines conventional, irregular and asymmetric activities in time and space.
(NATOTerm)

indirect fire
Fire delivered at a target, which cannot be seen by the aimer.
(NATOTerm)

infiltration
A technique and process in which a force moves as individuals or small groups over, through or around adversary positions without detection.
(NATOTerm)

information
1. Any communications or representation of knowledge such as facts, data, or opinions in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audio visual forms.
2. The knowledge concerning objects, such as facts, events, things, processes, or ideas, including concepts that within a certain context has a particular meaning.

(NATOTerm)

information activities
Actions designed to affect information or information systems. Note: Information activities can be performed by any actor and include protection measures.
(NATOTerm)

information environment
An environment comprised of the information itself, the individuals, organizations and systems that receive, process and convey the information, and the cognitive, virtual and physical space in which this occurs.
(NATOTerm)

integration
The progressive assembling of system components into the whole system.
(NATOTerm)

intelligence
The product resulting from the directed collection and processing of information regarding the environment and the capabilities and intentions of actors, in order to identify threats and offer opportunities for exploitation by decision-makers. Note: The term is also applied to the activity, which results in the product and to the organizations engaged in such activity.
(NATOTerm)

irregular activity
The use or threat of force by irregular forces, groups or individuals, frequently ideologically or criminally motivated, to effect or prevent change as a challenge to governance and authority.
(NATOTerm)

isolate
To prevent a hostile entity's freedom of movement and contact with external support.
(NATOTerm)

joint fires
Fires applied during the employment of forces from two or more components in coordinated action toward a common objective.
(NATOTerm)

joint fire support
Joint Fire Support is the coordinated and integrated employment of all weapon platforms delivering fires (It includes land, air, naval delivered indirect fires) to create the required effects on ground targets to support land operations in the full spectrum of conflict. It encompasses the integration of indirect fires and effects IOT influence the adversary forces, installations or functions.
(This is a new term which has been proposed to NATO in TTF 2014-0355)

land forces
Forces under command of a land component command.
(ATP-3.2.1, not NATO agreed)

land operation
A sequence of coordinated land activities performed on, under or over ground with a defined purpose.
(ATP-3.2.1 – not NATO agreed)

manoeuvre
Employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of advantage in respect of the adversary in order to accomplish the mission.
(NATOTerm)

march
A tactical movement between locations by combat and other forces during which enemy contact is neither expected, nor sought, despite the forces' preparation for such contact.
(NATOTerm)

mission
A clear, concise statement of the task of the command and its purpose.
(NATOTerm)

mission command
A philosophy of command that advocates centralised, clear intent with decentralised execution; a style that describes the ‘what’, without necessarily prescribing the ‘how.’
(ATP-3.2.2)

mobility
The ability of an entity to be moved by its associated means while retaining its availability during the move.
(NATOTerm)

neutralize
To render a hostile entity or materiel temporarily incapable of interfering with friendly forces.
(NATOTerm)

objective
A clearly defined and attainable goal for a military operation, for example seizing a terrain feature, neutralizing an adversary's force or capability or achieving some other desired outcome that is essential to a commander's plan and towards which the operation is directed.
(NATOTerm)

occupy
To position a force in a specified area or location that is free of active opposition.
(NATOTerm)

operating environment
A composite of the conditions, circumstances and influences that affect the employment of capabilities and bear on the decisions of the commander.
(NATOTerm)

operation
A sequence of coordinated actions with a defined purpose.
(NATOTerm)

raid
An operation, usually small scale, involving a swift penetration of hostile territory to secure information, confuse the enemy, or destroy his installations. It ends with a planned withdrawal upon completion of the assigned mission.
(NATOTerm)

riverine
An inland or delta area comprising both land and water, characterized by water lines of communication, including major rivers and tributaries or an extensive network of minor waterways, canals, and irrigation ditches.
(AJP-3.2)

rules of engagement (ROE)
Directives to military forces, including individuals, that define the circumstances, conditions, degree, and manner in which force, or actions which might be construed as provocative, may be applied.
(NATOTerm)

screen
In land operations, to protect the main body of a force by providing early warning.
Note: When screening, fighting is only conducted in self-defence.
(This is a new term and definition being processed for NATO Agreed status via terminology tracking file 2006-0174.)

secure
To gain possession of a specified area, location or objective and prevent its use or destruction by a hostile entity.
(NATOTerm)

seize
To take possession of a specified area, location or object by force. (NATOTerm)

stability policing (SP)
Police related activities intended to reinforce or temporarily replace the indigenous police in order to contribute to the restoration and/or upholding of the public order and security, rule of law, and the protection of human rights.
(NATOTerm)

strike
An attack which is intended to inflict damage on, seize, or destroy an objective.
(NATOTerm)

sustainability
The ability of a force to maintain the necessary level of combat power for the duration required to achieve its objectives.
(NATOTerm)

tactical activity
Military activities, offensive, defensive, stability and enabling executed on the tactical level.
(AJP-3.2, not NATO agreed)

unit
Within land forces a military element below brigade level.
(ATP-3.2.1, not NATO agreed)

withdraw
To disengage and move away from a hostile entity.
(This is a new term and definition being processed for NATO Agreed status via terminology tracking file 2008-0182.)

INTENTIONALLY BLANK

ATP-3.2.1.2(A)(1)