

FIRST BITES | Evolution of Urban Doctrine

First Bites are, as the name suggests, my early attempts to take my random notes and bring them into some sort of order. I am doing them primarily for myself so as to make it easier to refer to content and see how potential sections and chapters of the PhD might shape up, but I thought that others might find them useful, and I'd welcome any comments.

These ARE NOT draft chapters, they are WORKING NOTES and as such are likely to be full of errors and omissions and half-baked ideas, so I strongly suggest you check sources should you want to quote anything!

Any comments, errors and omissions and clear misunderstandings are welcome. More information on my PhD in Wargaming Urban Conflict is at <http://taunoyen.com/wiki/doku.php?id=phd> and you can contact me at david@burden.name.

Introduction

This chapter looks at how the official doctrine for urban conflict has developed in a number of organisations and countries over the last century or so. The focus here is on official doctrine documents, rather than studies or papers which are typically more fully covered in the Historiography chapter.

The countries and organisations covered in detail are:

- USA;
- UK;
- NATO;

The following countries (and others) are not considered here, principally due to the limited availability of public information in English:

- Russia/Soviet Union/Warsaw Pact;
- China;
- France (but assumed close to NATO);
- Germany (but assumed close to NATO);
- Israel.

Their current urban doctrine, particularly as evidenced by recent operations in the Ukraine and Gaza will be discussed in a later chapter.

The Evolution of USA Urban Doctrine

There are two big advantages of examining US urban doctrine. First, that almost all US doctrine publications are made publicly available on the Web upon release. Second, several books and reports have already presented examinations of the evolution of US urban doctrine, so to an extent

all that needs to be done here is to summarise this work. Key publications containing such examinations are:

- *Marching Under Darkening Skies* (Glenn, 1998);
- *City Fights* (Antal, 2003);
- *Storming the City* (Wahlman, 2015).

World War II

Although the US Army first significant encounter with urban combat was during the Mexican War of 1846-48, the 1923 Field Service Regulations (Field Service Regulations, Part 1, 1923), whilst including special environments such as woods, rivers and night operations contains no section on urban combat. With the impending outbreak of war the Tentative Field Service Regulations, Operations (FM 100-5, Tentative Field Service Regulations, Operations, 1939) included 4 pages combining operations in woods and towns, and this remained substantially unchanged (although urban was split into its own section) in the formal issue in 1941 of *FM100-5 Field Service Regulations: Operations* (FM100-5, Field Service Regulations: Operations, 1941) there still being no urban-specific doctrinal publication. Even the official journals and organs of the US military during the interwar period carried very little on urban combat (Wahlman, 2015).

Only 2 of FM100-5's 281 pages deal with Combat in Towns. FM100-5 states that: "*Combat within the limits of a town is characterized by reduced effectiveness of fire and observation, by increased importance of close combat, and by difficulty in control of troops. Fighting is at close range, and the outcome depends largely upon the initiative and aggressive leadership of subordinate commanders.*" (§877). The importance of isolation is stressed, and of taking a town from the flank or rear (and then pushing through to the opposite side) when time is of the essence. The use of visual and photo reconnaissance in order to determine enemy positions is highlighted, although noting that "*Towns offer concealment for troops and weapons and protection from fire of weapons and mechanized attack.*" (§876). More contentiously the doctrine states that "*Bombardment aviation is of first importance in reducing a stubbornly defended city. Destruction is methodical and ordinarily progressive from front to rear*" (§881) and that "Mechanized troops are of little value in combat within a defended town. Their use for such combat will probably result in excessive casualties, both in personnel and vehicles." (§881). For defence the manual sees "*its defensive capabilities are developed by organizing the outlying buildings and enclosures to form salients from which the front and the flanks of the town can be covered by flanking fire. Obstacles then are constructed within the town and groups of buildings are organized defensively to oppose any effort to penetrate.*" (§882).

The emphasis on aerial bombardment possibly came observing the Spanish Civil War and early experiences in World War 2 (Antal, 2003). Antal observes that "*much of the material on urban combat found in FM100-5, however, proved to be misleading*" (p390), whilst Wahlman sees that "*some of the points made in this manual remain valid to this day, such as the significance of decentralised commander control, and the importance of initiative and aggression for small unit leaders*" but also notes that it retains the 1939 Tentative version's "*pessimistic view on the utility of mechanised forces*" (Wahlman, 2015). One interesting change from the 1939 edition to the 1941 edition is the removal of the direction that, considering bombardment "*The enemy within the town is blinded with smoke and neutralised with high explosives and chemicals*" (§633).

In 1944 FM 31-50, Attack on a Fortified Position and Combat in Towns (FM 31-50, Attack on a Fortified Position and Combat in Towns, 1944) was issued. This 129 page document was divided roughly evenly between fortified positions, and combat in cities, towns, and villages, dealing with the topics from a perspective of Regiment and below. Much of the text is lifted from, or expands on, FM 100-5. The same concerns over mechanised forces remain, "*Operation of mechanized vehicles is ordinarily greatly restricted and canalized, subjecting them to close range attack by various weapons. Tanks are at a further disadvantage because of inability to elevate or depress their main weapons to fire into the upper floors or basements of nearby buildings*" (§67c4). It is more cautious about the use of Fires, recognising that the "*Close proximity of opposing forces will ordinarily limit the effectiveness of close support by artillery and zone-of-contact missions by combat aviation*" (§67c5). It also identifies that "*Communication will be impeded, thus making the decentralization of*

control to small units imperative”, re-iterating from FM 100-5 that *“This necessarily entails a high degree of initiative and a thorough understanding of the situation by junior leaders”* (§67c6).

In describing the urban environment FM 31-50 recognises that in large towns and cities the objectives are more likely to be strategic points such as transport and communications hubs and utility infrastructure. There are also the first elements of an urban terrain zone analysis of the different parts of a large urban settlement, and a description of how they might affect the fighting. The effect of rubble is also described: *“When a built-up area is the scene of a prolonged period of fighting, many of its characteristics will be modified. Buildings are likely to become heaps of rubble and observation is increased. When a whole sector of a town is reduced to rubble, the piles of debris render the area analogous to close country providing much cover; they will also restrict movement, except on foot. This possible change in the features of a built-up area must be borne in mind as influencing the methods of combat as the attack progresses”* (§69b). The manual also warns about the implications of the urban having a “third dimension”, with the enemy able to go over and under their attackers, and to bring fire down from above.

Although being disparaging about mechanised forces, FM 31-50 does see that *“Neutralization of hostile fires is of paramount importance. Due to the proximity of forces in fighting within built-up areas, much of the close-fire support will be furnished by infantry cannon using direct fire, and by elements of the antitank company. The bulk of the mortars and machine guns must be well forward”* (§70f). FM31-50 also notes that much urban fighting will be done at night due to the added concealment in open streets, that smoke is more effective when contained in streets, and that *“Frequently the quickest, surest, and most economical way of dislodging an enemy from a building will be to burn it”* but that *“The use of incendiaries must be carefully controlled since flame is a double-edged weapon which may affect either side”* (§73). In terms of the civilian population the manual instructs that *“The problems of controlling and administering the civilian inhabitants will nearly always arise, and may be complicated by a flow of refugees into built-up areas”* (§74b), noting the different degrees of allegiance (and hence assistance or resistance) that the population might have, the problems of looting, and how the population is likely to move away from wherever the most intense action is.

At a tactical level the manual recommended a top-down approach to clearing buildings, and sees an infantry battalion as having a frontage of only 1-4 blocks (§78b). It includes detailed tactical notes and advice on what would later be called FIBUA, and even includes a worked example of an urban Tactical Decision Game (TDG). The section on training even references the use of 3D models, noting that *“Built-up areas can be easily portrayed by means of sand table models, dolls' houses, and mock-ups”* (§110).

Antal sees FM 31-50 as reflecting *“the opinion of senior officers who considered city fighting identical to pillbox fighting”* (p.391), although given the improvements over FM 100-5 that seems a little harsh, although he does note that it builds on the experience of Allied troops (particularly one assumes in Italy). Wahlman is more positive, describing FM 31-50 as a *“magnum opus”* and a publication which *“managed to get a remarkable number of things right”* (p.19), although noting its ongoing aversion to the use of armour.

An updated edition of FM100-5 Field Service Regulations: Operations was issued in 1944 (FM100-5, Field Service Regulations: Operations, 1944), and opened with the doctrinally interesting words *“Set rules and methods must be avoided. They limit imagination and initiative, which are so important in the successful prosecution of war”*. There were still only 3 pages on Combat in Towns (of 319), plus another 7 on Attack on a Fortified Locality. Commanders were again instructed that fortified localities should be reduced by siege or attacked from the rear wherever possible (§756). Combat in Towns largely reiterates the 1942 edition, however the references to bombing to reduce the town are gone, and combat aviation has been relegated to a secondary supporting role (§858). The role of tanks is now being recognised – *“opportunities will present themselves frequently where the support of tanks in such situations becomes desirable”* (§858). These changes, as with FM 31-50, are assumed to reflect the realities of the warfighting on the continent. Antal also notes that FM 71-100, The Armoured Division (1944) recognised that armoured formations could take villages and most towns, but that well defended towns should be avoided, and that tanks were likely to be canalized and ambushed, or get stuck falling into basements.

Shortly after the war a new edition of FM 100-5 was published in 1949 (FM100-5, Field Service Regulations: Operations, 1949). Towns still only merited 2 pages, the main change from the 1944

edition being a further enhancement in the role of tanks and combined arms:

“However, opportunities will present themselves frequently where the support of tanks in such situations becomes desirable. In such cases, small infantry-tank teams are particularly effective. Tanks are capable of breaking through light and medium heavy construction. This, coupled with their ability to penetrate heavy walls with armour piercing shells and to attack enemy personnel with high explosive shells and machine gun fire, makes them an effective combination with infantry for fighting inside a town” (§823b).

In describing the use of support weapons, FM100-5 also explicitly mentions “*flamethrowers, individually carried and mounted on tanks*” for the first time.

Wahlman notes that in a series of General Board studies into lessons learned from World War 2 “*urban warfare was rarely mentioned and never presented as a serious challenge needing future attention*” (p.120).

Korea, Vietnam and the Cold War

FM 31-50 was revised in 1952, and FM100-5 in 1954. FM100-5 (FM100-5, Field Service Regulations: Operations, 1954) introduced the notion that towns were susceptible to destruction by atomic weapons, and to neutralisation by chemical, biological or radiological contamination, also noting that their underground transportation and sewerage tunnels could provide protection against atomic as well as conventional bombardment. All the previous discussion about tanks has gone, and attacking towns is dispensed with in 4 short sentences, two of which discuss the need to take measure to protect against looting and to control and relieve the civil population, the emphasis of what limited content there is on defence – presaging Cold War concerns.

FM31-50 (FM 31-50, Attack on a Fortified Position and Combat in Towns, 1952, pp. 31–50) is a more radical update of the 1944 version, and built on US experience in Seoul (Antal, 2003). The term “built up area” had now been brought in as an all-encompassing term to include villages, town, cities and industrial sites. Whilst still recommending bypassing FM 31-50 acknowledged that the defender may force the city to be attacked due to its political or strategic importance. The manual focussed more on Brigade level operations, rather than the individual and collective training of its predecessor. Each battalion was expected to have a frontage of around 4-8 blocks. In defence the Brigade would deploy a security force on the urban fringe (reinforced recce), its holding force (~ 2 battalions) on the Main Line of Resistance (MLR), and a reserve force (1 battalion). In the attack the first phase would be the isolation, the second the seizure of a foothold into the city, and third a systematic house-by-house, block-by-block advance through the city, with the second and third phases often running into each other. In planning Fires the manual discusses the implications of creating rubble – whether it will help or hinder the enemy or friendly forces. The importance of recce is also stressed, and the use of night to conduct offensive operations, and the use of armour in support of urban operations merits 1 ½ pages.

In 1957 FM 41-10 Civilian Affairs was published, providing more detail in this area, with editions lasting through to 2000.

FM100-5 was updated in 1962 and completely lost its main section headings on combat in towns and against fortified areas – although these were subsumed in subsections 178 (Fortified Area) and 179 (Built-Up Areas), under Battle under Special Conditions. The Built-Up Areas subsection was less than a page and largely referred the reader to the equally short section on Fortified Areas. Mention of nuclear, chemical and biological munitions, and rubble, were still there. It also gained over 30 pages on unconventional warfare, operations against irregular force and operations short of war (FM 100-5 Operations, 1962, pp. 100–105).

Urban doctrine also began to emerge in USMC doctrine during this period, notably in the 1945 manual for rifle squads (including top-down house clearance), the 1949 *Combat in Towns* manual (38pp, including about a third on a case study of Ortona), the 1965 *Marine Rifle Company/Platoon* manual having 10 pages on urban, and the 1966 *Rifle Squad* manual including an expanded section on “Combat in Built-Up Areas” (Wahlman, 2015)(p.124-125).

FM 31-50 was next significantly updated in 1964, and retitled *Combat in Fortified and Built-Up Areas* (FM 31-50 Combat in Urban and Built-Up Areas, 1964, pp. 31–50), with further changes in 1967 and 1972 reflecting experience in Vietnam (for instance in the use of airmobile forces). The

61 pages included about 25 on the attack and defence of Fortified Areas, and 30 on the attack and defence of built-up areas, including 3 pages on counter-guerilla operations. Notable points in the manual are:

- General advice that it “*may be preferable to bypass or destroy the area rather than become engaged*”;
- Continuing warnings about NBC operations;
- Advice to use wire and foot communications given the problems with radio communications;
- A call for direct fire weapons to be well forward and that they “*are more frequently attached to companies and to tunes than in other operations*”.
- Continuing stress on the importance of small unit leaders;
- A three tier UTZ schema of outskirts, residential and city centre - with advice on each;
- Notes on the importance of information, intelligence and reconnaissance;
- Advice for the first time on the employment of multiple brigades in urban operations;
- The importance of having plans to protect critical civilian infrastructure from damage;
- A continuing recognition that “*the use of portable or mechanised flamethrowers or other sinks injuries may be the quickest and most economical method of dislodging a defender from a building*” – but also with a recognition of the risk of creating further obstacles, there also being similar advice about the use of incendiaries;
- Tear gas “should be used whenever they will give assaulting groups an advantage inside buildings.”
- APCs should be used to protect soldiers moving between buildings, and protected by tanks from anti-armour weapons.
- An acknowledgement that ammunition demands will be high;
- Securing tunnels in order to provide security, and the use of night operations;
- The importance of civil affairs groups, and the issues of looting and managing the civilian population and refugees.

The attack was still a 3 stage process (isolate – foothold – advance & clear). The numbering of buildings and the use of phase lines to help with control is advised, as well as a discussion about where unit boundaries should be (through buildings not streets in less dense areas, down one side of a street in denser areas). In dense, block-type construction a company frontage is seen as being one city block. A combined arms approach is advised, with tanks supporting infantry with their MGs and main armament and “*firing at anything suspicious*”, and including “*steeple, tall chimneys, and other structures which may contain enemy observers*”. Infantry units should “*support the movement of tanks by locating targets, directing the fire of tanks, neutralizing or destroying antitank weapons, and protecting tanks from tank-hunter teams*”. Antal considers that the manual reflected a confidence in the US Army’s ability to conduct urban operations, to take a bolder approach when attacking and that “*much of the ‘mystique’ of urban combat had vanished*”.

It was probably this edition of US urban doctrine which Lt Col Cheatham (CO 2/5 UMSC) read up on in Phu Bai having learnt that he and his battalion were being sent to help retake Hue the following day in February 1968 (Wahlman, 2015).

FM 100-5 was updated again in 1968 (FM 100-5 Operations, 1968, pp. 100–105), with new sections on Airmobile Operations, Airspace management, Unconventional Warfare, Stability Operations and even Cold War Operations (although these are more Coalition and sub-threshold type operations). Fortified and Built-Up Areas were condensed to less than 1 page total. Each of the 3 paragraphs on Built-Up Areas includes mention of nuclear considerations, such as “*In employing NBC weapons, the commander must consider their effect on the civilian population and make plans for its control and evacuation*” (§6-42a) and “*In a nuclear environment, the advantages gained through the use of nuclear weapons must be weighed against the creation of obstacles to the assault force*” (§6-42b). There are also now cross-references to NATO STANAG documents in some areas.

In 1972 the US Army Infantry School at Fort Benning, Georgia published a 3 volume study on urban combat entitled Combat in Cities (Combat in Cities, 1972). The purpose of the study was to “*expand existing combat in cities doctrine by identifying voids and weaknesses for the*

promulgation of doctrinal changes applicable throughout the spectrum of urban warfare". The first part examines US and Soviet urban doctrine and provides an arm by arm and service by service analysis of urban best practice. The second part is essentially a training manual for urban operations with a focus very much on FIBUA. The third part (Volume III) looks at the effectiveness of each urban weapon type in turn and provides numerous detailed historic case-studies of their use. The report has an extensive bibliography, and seems to have informed a *Combat in Built Up Areas Handbook* that was published by the School in 1973.

The 1976 update of *FM 100-5 (FM 100-5 Operations, 1976, pp. 100–105)* added chapters for the first time on the Air-Land Battle, Electronic Warfare and Operations within NATO. The style was far more graphic and "designed" than previous editions. Urban was again relegated to the Special Environments chapter, but now had 9 pages. The words were almost all completely new and written in a slightly more informal style. A key statement was: "*Avoidance of built-up areas is no longer possible. Rather, military operations in built-up areas are an integral part of combat operations*", and the manual also states that:

"The whole subject of combat in built-up areas is one in which the US Army is not well versed. Our doctrine has centered on techniques of combat in cities or in house-to-house fighting, and the placement of weapons in the defense. These techniques remain important and will be updated in FM 90-10. However, the larger problem of conducting operations in continuous and contiguous built-up areas and the principles of these operations are new. It is a novel and untested dimension of warfare."

There is a map of urbanisation in West Germany and a table showing the worldwide growth in cities of more than 2.5 million inhabitants. Four types of urban settlement are identified: villages (<1001 pop), strip areas (connecting built-up areas), independent towns and small cities (1001-100,000 pop) and large cities, with tactical notes on each. The whole section is very much Western Europe centric.

In terms of operations the need for tanks to provide close support throughout is stated, as are the problems of rubble and communications, the use of airmobile forces with large urban conurbations (such as the Ruhr), and the value of reconnaissance, intelligence and HUMINT. There is no real mention of NBC warfare. The reader is directed to FM90-10 as the urban "how to fight" manual.

In reviewing this edition of FM 100-5, which was written at the direction of General DePuy (the first command of US Army's Training and Doctrine Command - TRADOC), Herbert found that whilst the manual "marked an important milestone in the Army's efforts to come to grips with the military challenges of the late twentieth century" it also "never gained the Army's confidence" and had to be replaced 6 years later. The deficiencies are identified as including a narrow European focus, an emphasis on counter-attack rather than attack, an over emphasis on weapons rather than people, a dogmatic, tutorial tone and reflecting too much of Dupuy's own personal biases (Herbert, 1988).

In 1977 General Starry, who had just taken over as the second commander of TRADOC, wrote to the Deputy Under Secretary of Defense that "*we have under development with the Germans in our series of staff talks with them a concept paper describing operational concepts for operations in built-up areas ... We plan to have the concept paper ready for our respective Chiefs of Staff to sign early next year*" (Sorley, 2009)(p.165). He also wrote that they were planning studies of the penetration effectiveness of various weapons against different building construction materials, that he was trying to get an urban training centre built at Fort Bragg but "*From time to time it suffers budget cuts from one or more of the many agencies who like to dabble in military budgets. It's currently under fire from OMB*", and that "*As for simulations of battle in built-up areas, we haven't any worth the title*". He also draws the distinction, which he thinks is rarely drawn, between fighting in urban sprawl, which he sees as inevitable and needing to be "*treated like terrain*" and fighting in the big urban centres which "*are places would like to avoid having to attack*". In summary he writes that "*No question that we don't have a very well-developed idea yet of what we want to do in built-up areas. Nor do we know what our present weapons and commo gear will do, and so we don't know what best to pursue technically in order to redress whatever imbalances there may be. And finally we don't have a very well-developed simulation method for analyzing war in a built-up area. So where does that leave us?*".

FM 90-10 Military Operations in Urbanised Terrain (MOUT) was published in 1979 – one assume the outcome of Starry’s deliberations and concept papers. It replaced the FM 31-50 series, had 200 pages and was well illustrated, as well as introducing the acronym MOUT. Chapters covered urbanisation and the characteristics of urban warfare, offence, defence and combat support and service support, with appendices covering urban terrain analysis, weapon effects and employment, the use of obstacles and mines, demolitions, the use of armoured forces and how to attack and clear buildings. FM 90-10 again acknowledges that “*adhering to the precepts [of avoiding built-up areas] is becoming increasingly difficult as urban sprawl changes the face of the battlefield*”. The same settlement categorisation as in FM 100-5 is used, along with 5 different UTZs (dense/random, closed-orderly block, dispersed residential, high-rise and industrial/transportation) and 9 specific building types. The settlement patterns of hub, satellite, network, linear and segment are also introduced. The characteristics of urban warfare are identified as: civilian populations and infrastructures, a more complex and varied terrain, the three-dimensional battle, the primacy of dismounted infantry support by other arms, reduced ranges of acquisition and engagement, poor communications, small-unit leader initiative and psychological and physical fatigue. Interestingly FM 90-10 considers that “*On the urban battlefield, advantages and disadvantages in the areas of mobility, cover, and observation tend to even out for attacker and defender. Initially, however, the defender has a significant tactical advantage over the attacker because of his knowledge of the terrain*”. In terms of tanks, the Appendix notes that “*Tank crews must expect to fight in built-up areas as an integral part of the combined arms team, providing their firepower and shock action to dislodge and destroy the enemy*”.

The analysis of attack and defence uses the Warsaw Pact doctrine for defence and attack respectively as its starting point – which will be considered later in this chapter. There is no longer an emphasis on attack from the rear – although operations against the enemy rear area are included. Hasty frontal attacks based on shock and overwhelming the enemy are offered as an alternative to isolation and deliberate attacks, with a manoeuvrist, emphasis on causing “*events to happen faster than the defender can react to them*.” Worked examples of a Division attack on a 40,000 population city (and of a Brigade attack on part of it), Division defence of 80,000, and Brigade defence of a 10,000 population town are provided.

Several of the Appendices deal with the more tactical aspects of urban operations, such as employing obstacles and mines and attacking and clearing buildings and preparing them for defence.

In reviewing FM 90-10 in 1999, LTC Mark Reardon, Combined Arms Doctrine Directorate, US Army Command and General Staff College (CGSC) wrote that “*The briefest of glances at the manual will disclose illustrations that feature typical German villages—a scene only slightly removed from our World War II experiences. Indeed, the Army’s experience in that war, with the exception of Seoul and Hue (both USMC operations), formed the predominant foundation for the 1979 version of the MOUT manual*” (Glenn et al., 2000) (Appendix M, p.392) and that “*Discussion of corps- and division-level offensive operations in the 1979 manual is concerned with bypassing or avoiding urban areas whenever possible. Brigade is the first echelon of command where specific discussion is found concerning combat operations within the town, yet even this discussion is focused on “systematic clearance of the town”—the World War II methods of conducting MOUT*” (p.392). His thoughts on how things had changed by 1999 will be considered below.

FM 100-5 was further updated in 1982 (*FM 100-5: Operations*, 1982, pp. 100–105) and 1986 (*FM 100-5: Operations*, 1986, pp. 100–105). The 1982 version now puts Urbanised Terrain (with only 2 pages – one the map of West Germany) in the Weather and Terrain chapter, and immediately directs the reader to FM 90-10 for the detail. However, whereas the 1979 version talked about avoidance as not longer being an option the new version starts by quoting Sun Tzu’s “*the worst policy of all is to besiege walled cities*” and has none of the aspirational wording of the earlier version. The 1986 edition aligns with NATO’s ATP35A and reiterates the AirLand Battle doctrine, and seems written at what it admits is a “more theoretical and more general” level than ATP35A, and possibly earlier editions. The urban section with the terrain chapter is barely a page, and again redirects to FM 90-10, It loses Sun-Tzu, but whilst still calling on commanders to avoid urban area unless absolutely required to do so it accepts that “*in the heavily industrialised regions of the world, it will rarely be possible to avoid urban combat altogether*”.

FM 90-10-1, first issued in 1982, is aimed more at the needs of the infantry battalion and below (*FM 90-10-1 Infantry Guide To Combat In Built-Up Areas*, 1982, pp. 90-10–11). The 288-page

manual includes chapters on the tactical impact of urban areas, urban terrain analysis, offensive and defensive operations, and combat support and combat service support. There are annexes on fundamental urban combat skills, urban building analysis, NBC in urban, attacking and clearing buildings, fighting positions, obstacles, mines and demolitions, subterranean route reconnaissance, the legal aspects of urban combat and using the M2 Bradley in the urban. The chapter on urban terrain analysis introduces a 6 type model of city core, core periphery, residential sprawl, outlying industrial areas, outlying high-rise areas and commercial ribbon. The manual is well illustrated with many useful tables, and is very practical in tone, as befits a battalion level document. Particular points raised include:

- Short and violent Fires to minimise rubble;
- The use of tanks, 155mm SP guns and CEVs in the direct fire role;
- The value of mortars;
- Combined arms operations, with tanks protected by, and supporting, infantry;
- Assigning a city block as the objective for a company group;
- Battalion frontage of 4-8 blocks in defence (2-4 deep), and 3-6 for a company (2-3 deep);
- The same inter-unit boundary approach as in FM 31-50 (1964);
- The use of the M2 Flamethrower and the M202 Flash flame projector.
- The use of CS and CN gas “when authorized”, with a note that CS is unlikely to be effective against troops trained in NBC defence.

Whilst FM 90-10-1 dealt with some of the omissions in FM 90-10 on infantry operations, the latter was still seen by some as deficient from an armour perspective. Dormeyer suggested adding dedicated MOUT chapters to the combined arms company (FM 71-1), battalion (FM 71-2), brigade (FM 71-3) and division (FM 71-100) manuals, as well as greater focus on armour in FM 90-10. Glenn (Glenn, 1998) describes several other reports and authors also calling for an extension to the armour coverage.

More generally, a 1986 report quoted by Glenn (Glenn, 1998) by the Defense Science Board (DSB) made observed that *“avoiding urban involvements is by far the wisest course. Yet we also recognize that in the contemporary world, and the substantially urbanized Third World, U.S. policy may dictate military operations that cannot avoid cities”*, and included in its “policy commandments” that the US should *“avoid Third World cities unless involvement is absolutely essential for the military mission and political objectives of the U.S. .. [and] ... Recognize that many contingencies will make involvement essential and unavoidable”*. The same report also noted that *“while U.S. capabilities... are potentially very substantial, those in being, ready-to-go are but a hollow facade”*, with the recommendation to develop a ‘more detailed’ and ‘appropriate’ urban operations doctrine”.

Antal identifies two reasons for the abeyance in urban doctrine development in the late eighties: first the collapse of the Soviet Union and the Warsaw Pact in 1991 – and the subsequent US shift to more global concerns, and second the uproar that FM 90-10 and MOUT doctrine caused when publicised by left-wing German activists – with obvious implications for German cities and the population (Antal, 2003)(p.411-2).

FM 100-5 was updated for the final time in 1993 (*FM 100-5 Operations*, 1993), and reflects a post-Cold War, increasingly joint and coalition based reality. Urban Operations occupies one paragraph in the Environment of Combat chapter, which directs the reader again to FM 90-10.

The first release of TC 90-1 Training For Military Operations On Urbanized Terrain (MOUT) was in 1993 (*TC 90-1 Training For Military Operations On Urbanized Terrain*, 1993). This was published in response to *“the increasing probability of and focus on low-intensity conflict (LIC), urban terrorism, urban insurgency, and civil disorder require that commanders and leaders increase emphasis on the tactics and techniques of urban combat”*. It differentiates between two different forms of MOUT:

- **“Surgical Military Operations on Urbanized Terrain.** These operations are normally conducted by SOF. They include raids, recovery operations, rescues, and other special operations.

- **Precision Military Operations on Urbanized Terrain.** These operations are conducted by conventional forces to defeat the enemy when he is mixed with noncombatants. Therefore, they are conducted carefully to limit noncombatant casualties and collateral damage and prevent friendly fire casualties. This type of operation requires strict accountability of individual and unit actions through strict ROE; it also requires specific TTP for precise use of combat power.”

There is a description of the MOUT Assault Course and of the Collective Training Facility (16 or 32 building training villages – notably with 50% of the buildings partially destroyed). The document is targeted at Battalion and below, with most tasks being at the Squad and Platoon level, and includes room and building clearance, breaching, top-down attack, and an “underground trainer”. In terms of combined arms, the manual states that *“The dismounted infantryman bears the brunt of the battle in MOUT Armored vehicles—tanks, BFVs [Bradley fighting vehicles], artillery, engineer vehicles, and APCs—function largely in a decentralized direct support role. However, success depends on all elements working as a combined arms team to make the most of individual unit abilities. Combined arms MOUT training is limited to the collective training facility (CTF) due to the destructive force and high cost of tank or BFV cannon ammunition”*. There is a useful bullet point summary of lessons learned from key urban battles since WW2.

TC 90-1 also (re)introduces the idea of urban wargames – or Battle Simulation Exercises (BSX):

“A BSX is a military war game that recreates combat situations on a map or terrain model. Pieces or markers represent units, and rules govern movement, fire, losses, and other aspects of actual combat. A BSX is the best type of exercise for leader training. Each leader leads the same type of unit he will lead in combat. A heavy/light scenario requires him to conduct MOUT as he would in real combat. Other players control the OPFOR.

(1) Players need not learn the game rules in detail; doing so could distract them from the MOUT tactics and techniques being taught. Instead, trainers and controllers are the game experts. This allows the players to concentrate on the training objectives.

(2) The training support center may be able to provide battle simulation war games.

Blockbuster is a battle simulation adapted for MOUT from the war game, Dunn-Kempf. The American-Canadian-Australian-British Urban Game (ACABUG) is a detailed simulation that might also help in training for MOUT. Other military war games can be adapted to MOUT, and some commercial games are based on MOUT subjects.”

Blockbuster, which was originally published in 1984, was recently republished by the History of Wargaming Project (Curry & Burden, 2023), and will be examined in a later chapter.

FM 90-10-1 was revised in 1993 as a more traditionally presented doctrine manual (*FM 90-10-1 AN INFANTRYMAN’S GUIDE TO COMBAT IN BUILT-UP AREAS*, 1993). There was more background on the AirLand Battle, and the section on Urban Analysis was expanded into a full chapter. The Mission, Enemy, Terrain, Troops, Time (METT-T) model was introduced to consider urban factors. Guidance on the attack and defence at Battalion, Company and Platoon level were given and there was a whole chapter now on fundamental urban combat skills, and another on the employment and effects of weapons. The chapter on Combat Service Support now included a substantial section on the legal aspects of combat. There was still a wide range of appendices looking at particular issues, and it includes the surgical and precision MOUT distinction. Glenn (Glenn, 1998) sees this issue of FM 90-10-1 as being superior to FM 90-10 “*in many instances*”, and particularly in its recognition of more constrained urban operations, that firefights are likely to happen at short ranges, and that shanty towns and slums are likely operating environments. In terms of deficiencies Glenn identifies a lack of consideration of the impact of the insubstantial buildings in such slums (high velocity rounds might travel from street to street), poor coverage of noncombatants, particularly withing the Intelligence Preparation of the Battlefield (IPB), and, more understandably given that it is an infantry manual, an incomplete doctrine for combined arms operations.

The 1995 FM 90-10-1 (*FM 90-10-1 Infantryman’s Guide to Combat in Built-up Areas.*, 1995, pp. 90-10–11) was a limited revision, adding appendices on countering urban snipers, close quarters combat (CQB) techniques, using armed helicopters in the urban, field expedient breaching of

common urban barriers and infantry and armour small-unit actions during MOUT.

By 1998 Glenn saw *"The most serious continuing shortfall is the persistence of the 1979 edition of FM 90-10 as the primary urban operations manual for the U.S. Army"* (Glenn, 1998) (p.9), and a rewrite of FM 90-10 was ordered in late 1997 (p.10).

A New Era

In 1998 the US Marine Corps (USMC) issued their own urban doctrine - MCWP 3-35.3 Military Operations on Urbanized Terrain (MOUT) (MCWP 3-35.3 *Military Operations on Urbanized Terrain (MOUT)*, 1998). MCWP 3-35.3 runs to 368 pages and *"provides guidance for the organization, planning, and conduct of the full range of military operations on urbanized terrain"* and is aimed at all levels from commanders and staffs down to squad and fire team leaders. It supercedes an earlier publication, Operational Handbook (OH) 8-7, Military Operations on Urbanized Terrain (MOUT), dated November 1980. As with FM 90-10-1 it provides instruction at the Battalion, Company and Platoon level in Offence and Defence, and in many ways it's a marine tailored version of that manual, with an almost identical structure. There appears to be surprisingly little (if anything) on littoral specific urban operations, but there is a half-chapter on Military Operations Other Than War (MOOTW). Glenn saw it as *"best combined arms urban operations manual in the U.S. military"* (Glenn, 1998)(p.11) with a more detailed consideration of weapon effects on urban structures than in FM 90-10-1, but noting ongoing deficiencies in its coverage of non-combat urban operations and in urban operations at the operational level. He recommends that it *"may also be prudent to adopt MCWP 3-35.3 as joint and other service doctrine during these updating processes"* (p.12).

In November 1999 the Center for Army Lessons Learned (CALL) made Urban Combat Operations the topic of their "newsletter". This 172-page document starts from the premise that *"U.S. doctrine on combat operations in urban areas is outdated"*, whilst recognising that MCWP 3-35.3 is a step in the right direction. Interestingly it sees the terms surgical MOUT, precision MOUT, and high-intensity MOUT as *"attempts at making urban combat something that it is not"*, and that:

"The distinctions between one phase of urban combat and the others are not precise ... [and] ... give our soldiers and leaders a false sense of security that the operation they are conducting will not escalate ... The sugar-coated version of urban combat will not reflect the truth. Battles in a city are savage, and many times do not allow for precautions normally taken in the field concerning refugees, civilian casualties, evacuation of friendly and enemy wounded and dead, and prisoners of war (POWs)." (p.9)

The document makes calls for improvements in urban training (using real cities not urban training "villages"), more appropriate weapons (large calibre direct fire HE, flame weapons), adequate quantities and types of urban combat supplies (e.g. grappling hooks, appropriate ammunition rounds), better radio communications, urban NBC training, and a more urban specific IPB. Their conclusion was that:

"Positive leadership is the key ingredient toward success of urban combat operations. The casualties, resource requirements, and collateral damage of urban combat are now and will always be unacceptable and will remain so unless the Army addresses this subject and prepares for this contingency. ... The Army cannot wait for the next revision of FM 100-5, Operations, to be completed. Possibly the best approach is to develop new TTP for future contingencies and conflicts now. Developing and formalizing the TTP may generate broader thought that will lead to new doctrine." (p.15)

In a presentation annexed in *The City's Many Faces* (Glenn et al., 2000), the proceedings of a RAND study conference on urban combat, Lt Col Reardon (previously mentioned) described how it was intended that the new FM 90-10 would seek to enable the US Army to "own the city" in the same way that it now "owned the night" – *"Combat in cities should not offer our enemies a significant operational/tactical advantage"* and that *"I would submit that the U.S. Army, rather than continuing to espouse avoiding cities, should instead confront the question of urban combat as avidly as our predecessors did when they sought a solution to the question of night operations."*

(p.390). A key declaration was that “rubble and clear” as an approach was “no longer militarily or politically feasible”, as well as identifying that “MOUT is much more than a question of firepower and technology – it must also encompass stability and support actions” (p.392). Further:

“It is immeasurably more difficult to “avoid” or “bypass” urban areas, and in most developed countries this has evolved to somewhat of an impossibility. Taking a cue from our doctrine, potential adversaries realize that they can accrue significant advantage from urban combat. This makes it very difficult for U.S. commanders to gain a force-oriented versus a geographical objective when the enemy deliberately chooses to fight in a city. The ability of the media to provide a center stage view of any military operation, when added to the popular and political expectation of “bloodless war,” ensures that we can no longer conduct “rubble and clear” MOUT such as the Russians were forced to do in Grozny. The inevitable cost measured in time, casualties, and treasure demand that we seek a innovative solution to the question of combat in cities.” (p.394)

The new FM 90-10 would lift its focus above the tactical and Brigade level, and ensure that the capabilities of all services were considered in the context of MOUT. There was also a recognition that “Current Army doctrine characterizes the civilian population as ‘hapless spectators’ [and the new] FM 90-10 must recognize that people are the lifeblood of a city and that they can have a decisive impact on MOUT”, and even that “Civilian considerations form the basic foundation for MOUT planning. The use of fires, choice of maneuver ‘corridors’, designation of nodal objectives, etc., are driven by civilian considerations. How can we effectively employ IO to separate threat from population if we inflict significant collateral damage? How can we support the needs of a 250K population when we have destroyed the city infrastructure?”

In terms of attacking into a city, an echeloned attack on a narrow axis/penetration “lane” to sieze key nodal points, informed by urban specific, culturally aware IPB and supported by Information Operations (IO – including PsyOps, Opsecm EW, deception, cyber) and precision fires, is proposed, limiting, or at least containing, collateral damage Figure 1. If the initial attack is blocked then the force can “branch out” into neighbouring streets, now operating in an “inside out” mode rather than one of “outside in”.

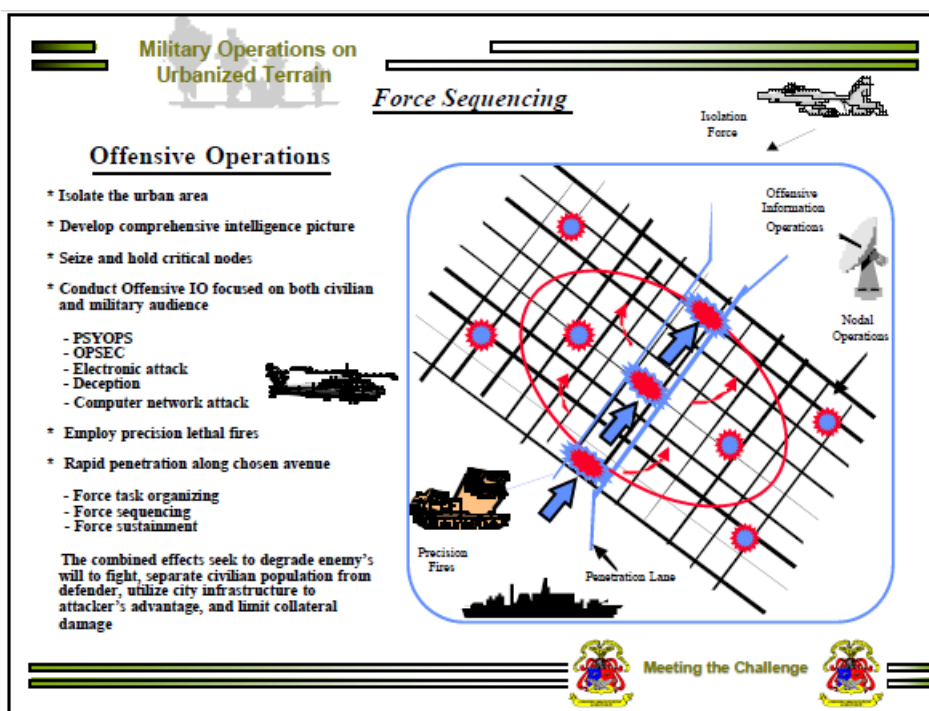


Figure 1: Force Sequencing in Urban Operations (Glenn, 2000, p. 401)

The RAND conference also reported on the work being done by the J-8 Joint Urban Working

Group to create a new J-8 Joint Urban Working Group (UWG) Handbook. This was aimed at a CinC level document and *“would not take the place of doctrine, but it might offer CINCs a useful planning tool for the near term, something that could prep them for an urban operation, short of the authoritative guidance that the eventual doctrine will provide”* (p.405) – a descriptive guide rather than prescriptive doctrine. As well as providing an introduction to urban operations, the operational context and practical considerations the handbook would also present 5 case studies (Grozny, Mogadishu, Panama City, Port au Prince and Sarajevo). It was intended to complete the draft in June 1999 (the conference was in March 1999!), with publication in October 1999. There was an expectation that, once released, JP 3-06, Doctrine for Joint Urban Operations would replace the Handbook.

The conference also had a presentation on the proposed JP3-06, Doctrine for Joint Urban Operations which included the first traces of the Understand-Shape-Engage-Consolidate-Exploit model for urban operations, with Engage being split into Isolate-Penetrates-Exploit (the earlier doctrinal trinity) and the concept was *“designed so that it is not conducted sequentially, but done simultaneously with specific points carrying the weight of the effort at a given time”* (p.468) (Figure 2).

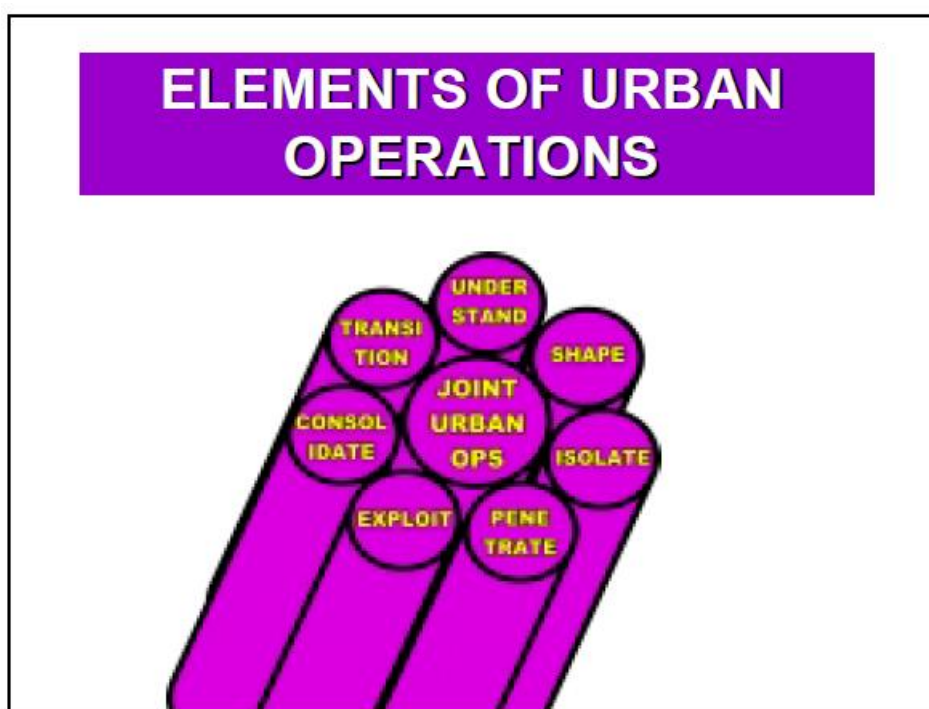


Figure 2: The first signs of the USECT model (Glenn, 2000 p.468)

It can be argued that the April 13–14, 1999 RAND Arroyo Center, Marine Corps Warfighting Lab (MCWL), and J8 Urban Working Group (UWG) conference on military urban operations represented something of a watershed moment in US urban doctrine, and the shift away from World War 2 era “rubble and clear” approach to something which put the civilian population, infrastructure and cultural issues far more at the centre of urban operations, and placed the USECT umbrella around the more traditional Isolate-Penetrates-Exploit. Whether the changes would then happen fast or deep enough would be severely tested in the coming decade and a half.

FM 3-0 Operations, the successor to FM 100-5 was published in 2001. This 318-page manual was laid out in a more modern style and included several dozen historical vignettes to illustrate different points. “Full spectrum operations” was the buzz-phrase, encompassing offensive, defensive, stability, and support operations. There was no explicit chapter or even section on urban. The document rolled back on the promise to “own the city”, and instead still saw that the enemy would *“use complex terrain, urban environments, and force dispersal methods ... to offset*

US advantages" (§1-29). In the section on complex operational considerations, three paragraphs deal with urban operations (§6-76 to 6-78). It describes urban operations as taking place in "a *topographical complex and adjacent natural terrain where manmade construction and high population density are the dominant features*" – the beginnings of the urban triad? The need for careful IPB is described, with effective Combat Service Support (CSS) and clear and appropriate Rules of Engagement (ROE). Combined arms is seen as important, even at the small unit level.

In 2001 the USMC, at the direction of General Krulak, conducted a set of battalion level urban exercises in an experiment called "Project Metropolis" (*Project Metropolis*, 2001). This looked at a variety of technical and tactical improvements, but found that good, hard, urban training made the principal difference (Betz & Stanford-Tuck, 2019). Simeoni (Simeoni, 2004) examines how the learnings during Project Metropolis were successfully applied during US operations in Iraq in 2003. A four-year revisit in 2019 dubbed "Project Metropolis II" (South, 2019) was cancelled after one year as the USMC shifted back to the littoral (Anderson, 2023).

Also in 2001, the Center for Emerging Threats and Opportunities conducted "a two-day operational wargame on July 24 and 25 at the Potomac Institute for Policy Studies and is part of Project Lincolnia, a continuing effort to examine the strategic, operational, and tactical implications of urban war operations" (*Wargame Explores Urban Warfare - UPI Archives*, 2001). The wargames built on wargames held the previous month and were "the U.S. military's first attempt to examine all the levels of warfare in the urban environment [growing] out of a report last year by the Government Accounting Office that criticized current Department of Defense efforts in urban warfare as being too focused on tactical-level operations."

JP 3-06, Doctrine for Joint Urban Operations became the new capstone document for US urban doctrine in 2002, and the series continues to the present day (Department of Defense, 2013). JP 3-06 "addresses the planning and conduct of joint urban operations and explains how they differ from other operations. It focuses on the operational level of war and addresses issues across the range of military operations. It provides doctrinal guidance focused on capabilities and tasks that are unique to, or significantly challenged by, the urban environment at the operational level of warfighting". In 152 pages the chapters cover:

- Characteristics of Urban Areas and Military Urban Operations;
- Fundamentals for Planning and Conducting Joint Urban Operations;
- Operational Tasks and Considerations;
- Non-Combatants; and
- Infrastructure (including collateral damage and restoration).

Appendices cover Joint IPB for urban, Joint Fires, ports and airfields, and airspace control. The "urban triad" of physical terrain, population and infrastructure is introduced on the first page, and the idea of a city as a dynamic systems of systems is also explained. The standard differentiation of surface types is also introduced as shown in Figure 3.

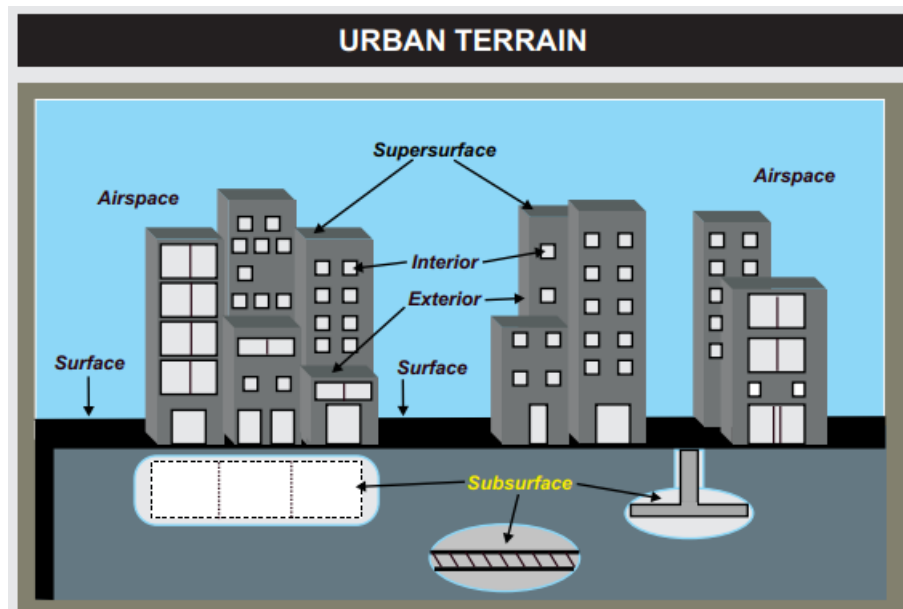


Figure 3: Urban terrain surfaces (JP 3-06, fig I-1)

The characteristics of urban combat are identified as:

- Cities reduce the advantages of the technologically superior force;
- Ground operations become manpower intensive;
- Ground operations become decentralized;
- Operations are time-consuming;
- Combat operations in urban areas result in large ratios of civilian to military casualties;
- Operations in urban areas are conducted under more restrictive constraints than operations elsewhere;
- Physical terrain changes weapons and munitions effects;
- Logistic support requirements are different and often more demanding in urban areas; and
- Urban areas provide advantages to defenders, insurgents, and terrorists.

The operational language is the language of Centres of Gravity (COGs), noting that “Operational COGs within the urban area may be physical or psychological” (p. II-5). The USECT doctrine is also formally introduced (p. II-8), as is the idea of Consequence Management (CM) – “those measures taken to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals” (p. III-28).

Writing in 2007, Glenn saw JP 3-06 as a “milestone document”, but one which could be “considerably improved by incorporating insights gained since its writing” (Glenn & Glenn, 2007)(p.21) – this was of course around the peak of the Iraq Insurgency. The main deficiencies were seen in needing more coverage of stability and support operations, better orchestration of military and non-US defence departments, better planning tools and more explanation of the primary role of HUMINT.

FM 3-06.11 Combined Arms Operations in Urban Terrain, a retitled FM 90-10-1 was also published 2002 (*FM 3-06.11 COMBINED ARMS OPERATIONS IN URBAN TERRAIN*, 2002). This provides more tactical detail in a 644 page document. The broad chapter and section headings of the last issue of FM 90-10-1 are maintained, but Brigade level operations are now included, as are concepts such as “nodal attacks”, and practical information on defence against enhanced flame weapons (such as the RPO-A) and navigation in the urban (and when GPS denied). The brigade offensive operation are explained in terms of an Assess-Shape-Dominate-Transition model, rather than USECT. Offensive operations are categorised as:

- Movement to contact by search and attack;
- Attack on a single axis;
- Attack on multiple axes;
- Cordon and attack;
- Fix and bypass; and
- Multiple nodal attacks (rapid attacks followed by defensive operations, with the limit of the brigade's self-sustainment capability).

Defence is considered in terms of defence of a village, defence by sector (4-12 blocks for a battalion), nodal and delay.

There is very much a global focus in the examples and instructions, and a UTZ model presented, with more information in FM 34-130 Intelligence Preparation of the Battlefield (1994 onwards). Many of the appendices are promoted to chapters, there is a new chapter on stability operations and support operations, and new appendices on Information Operations, Coalition Operations, Weapons of Mass Destruction (WMD) and Toxic Industrial Materials (TIMs), Intelligence Requirements, Building and Room marking, Mortars and Communications. Appendix F on WMD and TIMs explains the current (then and now?) situation on Riot Control Agents such as CS Gas:

“National Command Authority (NCA) approval is required prior to using riot control agents (RCAs). Executive Order (EO) 11850 prohibits the use of RCAs during offensive operations regardless of whether the enemy is using noncombatants as human shields. EO 11850 also renounces first use in armed conflict except in defensive military modes to save lives such as: Controlling riots, Dispersing civilians where the enemy uses them to mask or screen an attack, Rescue missions” (p. F-3).

Appendix H presents lessons learned from modern urban combat and examines Chechnya/Grozny, Beirut, Mogadishu. The main lessons identified are:

- Poor communications;
- Short engagement ranges;
- Difficult command and control;
- Difficult target acquisition;
- Reduced effectiveness of Fires and transportation;
- Harder to provide logistic support;
- Snipers are almost always present;
- Stress is extremely high;
- There is no US comparative advantage;
- Urban warfare degenerates into small-group fighting;
- Armour is important – “an infantryman's friend”;
- Infantry has primacy – but is needed in large numbers;
- Aircraft are a mixed blessing;
- Population control is critical;
- Direct HE is very useful, especially give the non-availability of flame weapons;
- Rules of engagement management is vital;
- Urban is difficult for attackers to prevail, but they almost always do.

TC90-1 Training for Urban Operations was updated in 2002 (*TC 90-1 Training For Urban Operations*, 2002). In 144 pages it includes practical training advice on the urban assault course, the shoot house, the breach facility and combined arms training facilities. Some of the broader content from the 1993 edition has gone, including the lessons learned and the separation of precision and surgical MOUT. The wargame and BSX has been made subservient to the command post exercise, and the talk is around the use of JANUS (*Janus, a Conflict Simulation Model | Science and Technology*, n.d.) and JCATS (*JCATS: Joint Conflict and Tactical Simulation*, n.d.)—early computer wargaming systems. There is though more information on the use of simulation and

demolition effects simulators, and the whole document is framed by the Live-Virtual-Constructive model which is still the primary way of approaching training from a technical perspective.

In 2004 the latest in the series of Unified Quest wargames examined some aspects of urban operations (Johnson et al., 2006), including exploring “*network-enabled battle command and the unit of employment’s (division) ability to conduct shaping and decisive operations in urban terrain*” and the capabilities required to conduct joint urban operations.

FM 3-06 Urban Operations was issued in 2006 (*FM 3-06 Urban Operations*, 2006). This 315-page manual provided Army specific information that followed on from the new approach to urban introduced in JP 3-06. The preface to the manual is interesting, both for the restatement that rules-based doctrine is undesirable, and that urban may become the dominant form of future combat:

“Rather than establishing a set of hard and fast rules, the objective of doctrine is to foster initiative and creative thinking. To this end, FM 3-06 discusses major Army operations in an urban environment. This environment, consisting of complex terrain, a concentrated population, and an infrastructure of systems, is an operational environment in which Army forces will operate. In the future, it may be the predominant operational environment. Each urban operation is unique and will differ because of the multitude of combinations presented by the threat, the urban area itself, the major operation of which it may be part (or the focus), and the fluidity of societal and geopolitical considerations. Therefore, there will always exist an innate tension between Army doctrine, the actual context of the urban operation, and future realities. Commanders must strike the proper balance between maintaining the capability to respond to current threats and preparing for future challenges” (p. vi).

FM 3-06 also sees the passing of the term MOUT, being replaced by simply Urban Operations (OU) (p.viii). Sas with JP 3-06 there are historical and other vignettes (including the three-block war) throughout the manual. The chapters and appendices are reflective of the broader outlook suggested by the preface:

- The Urban Outlook;
- Understanding the Urban Environment;
- Understanding the Urban Threat;
- Understanding the Urban Environment’s Effects on Warfighting Functions and Tactics;
- Contemplating Urban Operations;
- Foundations for Urban Operations;
- Urban Offensive Operations;
- Urban Defensive Operations;
- Urban Stability and Civil Support Operations;
- Urban Sustainment;
- Appendices:
 - Siege of Beirut: An Illustration of the Fundamentals of Urban Operations;
 - An Urban Focus to the Intelligence Preparation of the Battlefield;
 - Operations in Somalia: Applying the Urban Operational Framework to Stability Operations;
 - Joint and Multinational Urban Operations.

The urban triad (explained as terrain, infrastructure and society, with infrastructure being the overlap between the other two), centres of gravity (including the population) and the USECT model are all in evidence, as are full spectrum operations. The near-classic model of urban functional zones is also there (Figure 4) – with a special emphasis on Toxic Industrial Materials. With regards to the debate about whether urban should be a specialist task FM 3-06 sees that “*every soldier is an urban warrior*” (p.1-10), with the provision of urban capability closely linked to the DOTMLPF model (doctrine, organizations, training, materiel, leadership and education, personnel, and facilities).

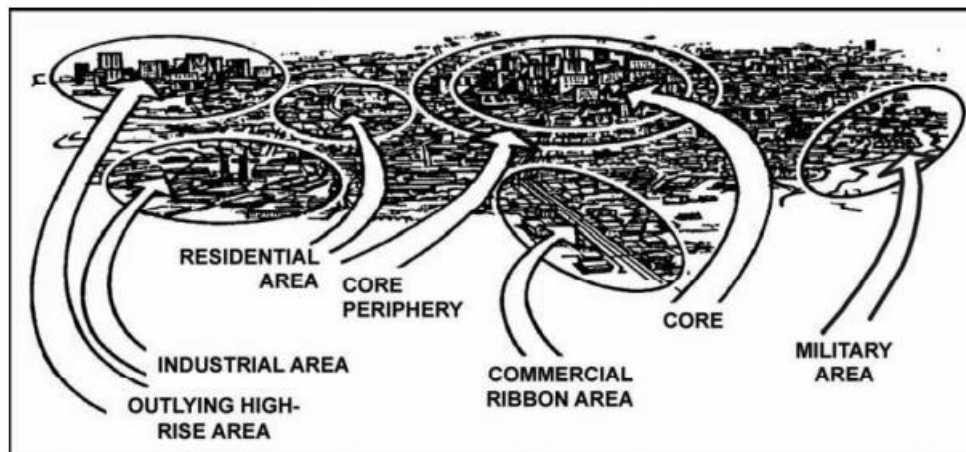


Figure 4: Urban Functional Zones (from FM 3-06, 2006; Fig 2-5)

There is significant coverage of the human issues, with a useful model of urban society (Figure 5), an acknowledgement that all or part of the civil population may represent a potential centre of gravity, a description of the “chain of effects” between UO activities and their iterative effects on society and back on OU activities, and a description of cities as a system of systems.

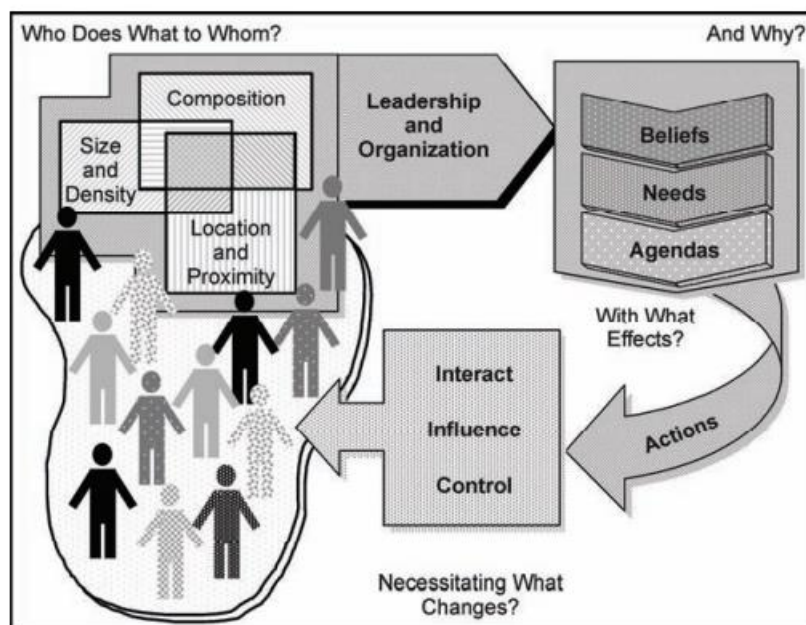


Figure 5: Simplified analysis of urban society (from FM 3-06, 2006; Fig 2-9)

Urban threat tactics are identified as:

- Use the population to advantage;
- Win the information war;
- Manipulate key facilities;
- Use all dimensions;
- Employ urban-orientated weapons;
- Engage entire enemy force;
- Focus attacks on support areas, isolated groups, and individuals.

There is significant coverage on the use of Fires in urban, including the targeting process and precision weapons, urban ISR, CEMA, information, civil-military and psychological operations. Urban is seen as compressing tactical factors such as time, distance, density, combat power, levels of war and decision-making. The manual considers the factors that may compel a commander to attack an urban area, and states that *“When determining whether to operate in an urban environment, commanders must consider the operational (and accidental) risks and balance them with mission benefits”* (p. 5-1) – the doctrine has come a long way from “do not attack the city”. In considering the USECT model “isolation” has been moved from the Engage phase (where it was in the earliest versions) to the Shape phase, and it is described as being achievable through electronic and psychological means, as well as physical. The Fundamentals of urban operations are identified in Figure 6

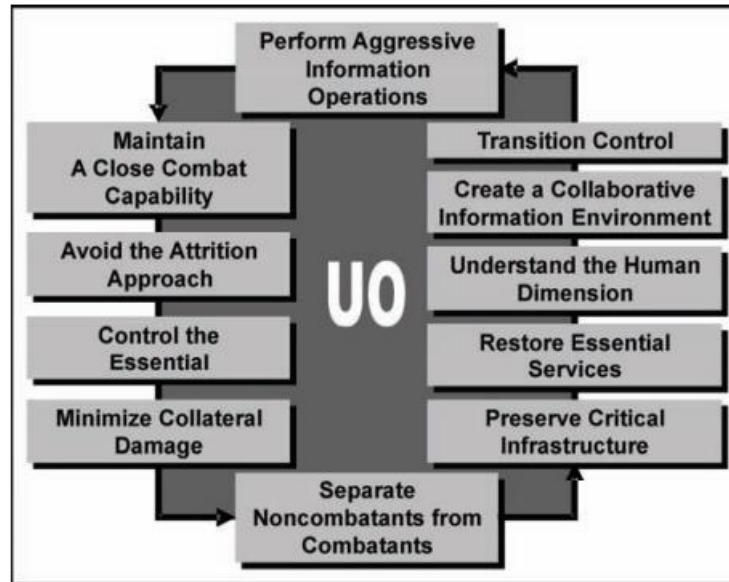


Figure 6: Fundamentals of urban operations (from FM 3-06, 2006; Fig 6-4).

The forms and types of urban offence are identified as envelopment, turning movement, infiltration, penetration, and (least favoured) the frontal attack. Urban defence is categorised as area, mobile or retrograde; there is no mention of nodal type approaches.

FM 3-0 was rewritten in 2008 (FM 3-0 Operations, 2008, pp. 3-0). It describes itself in the Foreword thus:

“This edition of FM 3-0, the first update since September 11, 2001, is a revolutionary departure from past doctrine. It describes an operational concept where commanders employ offensive, defensive, and stability or civil support operations simultaneously as part of an interdependent joint force to seize, retain, and exploit the initiative, accepting prudent risk to create opportunities to achieve decisive results. Just as the 1976 edition of FM 100-5 began to take the Army from the rice paddies of Vietnam to the battlefield of Western Europe, this edition will take us into the 21st century urban battlefields among the people without losing our capabilities to dominate the higher conventional end of the spectrum of conflict.”

Separate chapters on the attack and defence are gone for the first time, and the emphasis is on full spectrum operations and the operational art, with Information Superiority ranking its own chapter. Urban operations warrant only two mentions (one regarding the use of combined arms Stryker company groups in urban), the reader being directed to JP 3-06 and FM 3-06 for more information. Change 1 to FM 3-06 was issued in 2011 which emphasised the hybrid threat, split “information operations” into Inform and Influence Activities (IIA) and Cyber/Electromagnetic Activities (but removed the Information Superiority chapter), and introduced a Design phase when

dealing with complex problems and mission command to come before the deciding and direction phases. The reference to urban operations was unchanged.

TC90-1 Training for Urban Operations was again updated in 2008 (*TC 90-1 Training for Urban Operations*, 2008), and reflected the retitling of MOUT as OU. It otherwise seems not to have been changed much, and wargames are again omitted in preference to JANUS and JCATS.

JP 3-06, Joint Urban Operations was updated in 2009 (*JP 3-06 Joint Urban Operations*, 2009). This seems, if anything, retrograde step. The chapters on Infrastructure and Noncombatants removed – although some of their content moved into the discussion on PMESII, and the USECT model has been replaced by a less defined set of six phases - shape, deter, seize initiative, dominate, stabilize, and enable civil authority. On the positive side PMESII itself is a new concept and still in use (an analysis of political, military, economic, social, information, and infrastructure systems), the old IPB appendix has now been broadened into the Intelligence Preparation of the Operational Environment (IPOE) in Urban Areas., and there is now an appendix on urban maritime considerations and capabilities. The urban triad is now more precisely defined as:

- A complex man-made physical terrain consisting of manmade structures of varying types, sizes, materials, and construction;
- A population of significant size and density inhabits, works in, and uses the man-made and natural terrain; and
- An infrastructure upon which the area depends.

ATTP 3-06.11 Combined Operations in Urban Terrain replaced FM 3-06.11 in 2011. ATTP 3-06.11 is a significant re-write with the manual being split into two parts, Part 1 looking at Brigade and Battalion, Part 2 at Company and Platoon. The urban skills chapter is pushed towards the end. Within each part of attack and defence are considered, and the USECT model is still strictly followed in all 4 sections. There is a chapter on Light-Heavy integration dealing with the role of AFVs in urban, and sizeable appendices on the urban environment (UTZ, street patterns, structures, TIMs) and weapon considerations and effects – with a very useful and concise penetration table.

In 2011 the Joint Urban Operations Office, along with its parent Joint Forces Command, was dissolved – “the US military lost its only office ... solely focussed on urban operations. No office or like organization has been create since” (Collins & Spencer, 2022)(p.360).

The 2013 update of *JP 3-06 Doctrine for Joint Urban Operations* was more minor than the 2009 release, mainly expanding, updating and revising coverage in areas such as air operations, understanding the urban environment, intelligence preparation, fire support, legal considerations and maritime considerations (*JP 3-06 Joint Urban Operations*, 2013).

The Return to Large Scale Combat Operations

In 2014 the Chief of Staff of the Army's Strategic Studies Group published *Megacities and the United States Army: Preparing for a Complex and Uncertain Future* (Harris et al., 2014). This 28-page document defined a megacity as one with over 10 million people. Its rationale was that “A gap exists in the Army's doctrinal understanding of large cities. Moreover, megacities are not treated as units of analysis for study and intelligence collection or featured in planning scenarios. The Army, and the DoD community more broadly, neither understands or prepares for these environments” (p.8). The paper included 6 case studies (New York, Bangkok, Rio de Janeiro, São Paulo, Lagos and Dhaka (Bangladesh)). Its conclusions were that megacities were unavoidable, that the Army must lead the megacity challenge, and that the Army is currently unprepared for an environment “so complex and beyond the scope of its resources” (p.21). The US Army's Unified Quest wargames in 2014 examined the issues of conflict in and around megacities (Kaune, 2016), although the Unified Series has been criticised for being “far too simplistic, often aggregating large numbers of disparate social groups into a few manageable ones, and wishing away many of the complexities inherent to the modern urban environment” (Dixon, 2016). The Mad Scientist (a TRADOC) initiative, produced a compendium of Megacity papers - *Mad Scientist: Megacities and Dense Urban Areas in 2025 and Beyond* - in 2016, such was the level of interest and activity on the topic (Mad Scientist, 2016).

Also in 2014, *Win in a Complex World*, the new US Army Operating Concept, included “dense urban areas” on its Win in a Complex World logic chart seeing it as one of the 5 characteristics of the future operating environment (alongside velocity, overmatch, WMD and cyber/space) (*The U.S. Army Operating Concept - Win in a Complex World - Army Operating Concept 2014 (TP525-3-1)*, 2014).

ATP 3-06 Urban Operations was a joint US Army/USMC publication (known as MCTP 12-10B by the USMC) and replaced FM 3-06 (*ATP 3-06 Urban Operations*, 2017). It was only 128pp long, compared to FM 3-06’s 315pp. The chapters on threat, understanding the urban environment and sustainment were removed, as well as all the annexes (including the one on urban IPB). The urban triad is still there (although now shown as a pie chart rather than a Venn diagram), and there is still a high-level treatment of UTZs and street patterns. The urban society diagram from FM 3-06 is reproduced (Figure 5), and there is the same infrastructure analysis, fundamental tasks (Figure 6), and set of offensive and defensive forms. USECT is just about there, with a bullet for each activity in foundations for urban operations, but without being labelled USECT.

FM 3-0 Operations was significantly revised in 2017 (*FM 3-0 Operations*, 2017, pp. 3–0) and seems to have a more practical, less theoretical tone than its predecessor. It also focuses on Shape and Prevent operations (one chapter each), as well as actual warfighting. There are also whole chapters on Large-scale Combat Operations (LSCO), Large-scale Offensive Operations and Large-scale Defensive Operations, and on Actions to Consolidate Gains. Urban effective gets one paragraph (of 364) pages which advises that forces *may* conduct LSCO in urban areas and that “*Commanders may conduct urban operations because they provide a tactical, political, or economic advantage, or when not doing so threatens the joint campaign*” (§.5-28). FM 3-0 did though introduce a “logic chart” which does place urbanisation as a key consideration, and usefully illustrates the new Shape-Prevent-LSCO-Consolidate model for all operations (Figure 7). The Change 1 to FM 3-0 issued later in 2017 does not seem to have had many substantive changes.



Figure 7: FM 3-0 Logic Chart (detail) (from FM 3-0, 2017; p.x)

ATP3-21-51 Subterranean Operations was first published in 2017 and revised in 2018 and 2019, and possibly subsequently (*ATP 3-21.51 Subterranean Operations*, 2019). The 2019 version runs to 228 pages and includes chapters on the subterranean environment, the threat, Brigade Combat Team and Battalion operations, Company and Platoon operations, squad and individual techniques, enabling organisations, obstacles and capabilities and sustainment, with appendices on medical considerations and training. Subterranean environments are categorised as:

- Category 1: Tunnels, caves and natural cavities;
- Category 2: Urban subsurface systems, which in turn is divided into:
 - Substructures – such as basements and underground parking; and
 - Civil works – such as subways, sewers and aqueducts;
- Category 3: Military purposes underground facilities – further sub-categorised into Shallow (< 20m) and Deep (>20m).

TRADOC set out the US Army vision of Multi-Domain Operations (MDO) in *TP525-3-1 The U.S. Army in Multi-Domain Operations 2028 (TP525-3-1 The U.S. Army in Multi-Domain Operations 2028, 2018)*. This includes a whole annex on MDO in Dense Urban Terrain (DUT). The annex particularly draws on the findings of the Mosul Study Group. It considers DUT in terms of its

physical, cognitive and operational characteristics, and applies the 3 tenets of MDO:

- Calibrating force posture - for instance in *“visualizing urban environments in enough detail to anticipate their unique force generation, sustainment, and intelligence requirements during conflict”* (p. D-5);
- Multi-domain formations - having such formations able to survive the attrition of the urban environment, with independent manoeuvre, cross-domain fires and information activities having effect across the physical, cognitive and operational, and an awareness of the physical and psychological pressure on friend and foe; and
- Convergence – and the challenges of achieving it in a *“complex and congested physical and virtual environments and potential restrictions of rules of engagement. There may be increased use of nonlethal effects, and not all lethal effects may be useable”* (p. D-6).

The annex concludes by stating that:

“Urban environments are inherently multi-domain. The interconnectedness of urban areas enables the flow of information, people, and commodities that make this environment disproportionately influential to all human affairs, including armed conflict. Dense urban terrain compresses physical and temporal spaces, compounds obstacles, and demands the simultaneous execution of multiple tasks. This means that while operations are slowed, the pace and complexity of tactical engagements increases. Employing the components of MDO in conjunction with improvements in Army capacity and capability to understand, organize, and train to operate in DUT enables successful operations.” (p. D-6).

In 2020 TRADOC issued *Pamphlet 525-92-1 The Changing Character of Warfare: The Urban Operational Environment* (TP525-92-1, *The Changing Character of Warfare: The Urban Operational Environment*, 2020). This 38-page document was a sibling to TP 525-92 on *The Operational Environment and the Changing Character of Warfare*. The aim of both was to describe rather than predict the future operating environment. It *“presents a continuum divided into two distinct timeframes: The Era of Accelerated Human Progress (2017-2035) and the Era of Contested Equality (2035-2050), which depict different doctrinal and technological challenges that the U.S. Army will face in the near to mid-future”* (p.1). After setting the scene of a constantly urbanizing world it uses the PMESII-PT model to examine the strategic, operational and tactical level implications of the future scenarios being examined. It also looks at the implications for Mission Command, Training, Technology and Modelling and Simulation. Twelve trends are represented by the scenario:

- Emerging S&T trends
 - Power generation and storage;
 - Technology, engineering, and manufacturing;
 - Robotics;
- Information, space, cyber, and computing
 - Big data;
 - Cyber and space;
 - Artificial intelligence;
 - Human computer interaction;
- Society, biomed, and performance
 - Collective intelligence;
 - Increased level of performance;
- Strategic world
 - Climate change and resource competition;
 - Demographics and urbanization;
 - Economic rebalancing.

The concluding observations are quite telling – *“Many of the challenges identified – for example, the cost of building and maintaining urban training sites, the need for more sophisticated urban modeling and simulation capabilities, and the extraordinary difficulty inherent in targeting foes amidst an urban population – have long been recognized yet thus far remain insufficiently*

addressed” (p.29). In terms of warfighting, the report considers that:

“Potential adversaries will seek to contest equality in the dominions they believe will provide a competitive advantage. Our response should include maneuvering through multiple domains at various echelons such that a foe’s achieving equivalence in one arena leaves him vulnerable via assaults from others. The complexity of the urban environment and its many interconnected systems offers fertile ground for innovative forms of armed conflict and competition in the coming decades” (p.30).

ATP 3-06 was most recently updated in 2022, although there is also talk of a “brown book” on urban (ATP 3-06 *Urban Operations*, 2022). It is almost twice the size of its predecessor, and whilst following the same overall structure it adds a chapter on Large Scale Combat Operations (LSCO) – which also includes the consolidation of gains - and appendices which cover offensive, defensive and stability vignettes, training and combined and partnered urban operations. The urban battlefield is also placed within a multi-domain context, and there is a brief discussion of megacities. A distinction is drawn between large-scale combat operations (which may not involve significant land forces) and large-scale ground combat operations (which will), and there is a section on urban littorals. There is also a useful table which relates settlement sizes to categories, quantified population densities and structural densities, historic combat examples and modern US examples (Figure 8).

Nomenclature	Population Range ^a	Population Density (/KM ²) ^b	Area (KM ²)	Structural Density (M ² /KM ²) ^c	Historical Operational Example	Current Example
Suburb	0–4,999	1,250	1–4	Low 500–4999		Quantico, VA
Village	5K–9,999	1,900	3–5	Low 5–49K		St. Roberts, MO
Town	10K–49,999	2,500	5–20	Low–Mod. 50–499K	WWII, Defense of Bastogne, 1944	Key West, FL
City	50K–99,999	3,100	10–32	Low–Mod. 500–999K	WWII, Encirclement of Aachen, 1944	Manhattan, KS
Divisional City	100K–199,999	3,500	20–65	Mod. 1MM	Vietnam War, Defense of Hue City, 1968	Colorado Springs, CO
Area City	200K–299,999	4,300	30–70	Mod. 3MM	OPERATION (OPN) IRAQI FREEDOM, Seizure of Fallujah, 2004	Fayetteville, NC
District City	300K–399,999	4,900	40–80	Mod.–Hi 5MM	-WWII, Defense of Stalingrad, 1944 - OPN ECLIPSE, Seizure of Raqqa, 2017	Honolulu, HI
Provincial City	400K–499,999	5,500	40–90	Mod.–Hi 7MM	UNOSOM, Raid of Mogadishu, 1993. OIF, Control of Ramadi, 2006.	Pierce, WA
Regional City	500K–999,999	6100	40–250	Mod.–Hi 9MM	OPN IRAQI FREEDOM, Stability of Basra, 2007	El Paso, TX
Echelons Above Corps^d						
Metroplex ^e	1MM–4,999,999	6,600	40–100K	Hi 12–15MM	-Amphibious Encirclement, Manila, 1944 - OPN EAGLE STRIKE, Seize Mosul, 2016-2017	Dallas-Fort Worth, TX
Metropolis ^f	5MM–9,999,999	6–10K	40K–50K	Hi 15–18MM	None	Los Angeles, CA
Megacity ^g	10MM +	7K +	50K +	Hi 20MM +	None	New York City, NY

Figure 8: Conurbation and population infrastructure densities (from ATP 3-06, 2022; Fig 1-2)

The USECT model is initially further blurred with the “engage” bullet now replaced by prevent, effects/LSCO and converge/multi-domain statements, but then in §2-27 it states that “a useful training, planning, and execution consideration model used in chapters 4 through 7 is an understand, shape, engage, consolidate, and transition framework.” – but again without calling it USECT. Alongside USECT an operation sequencing model is used, shown in Figure 9.

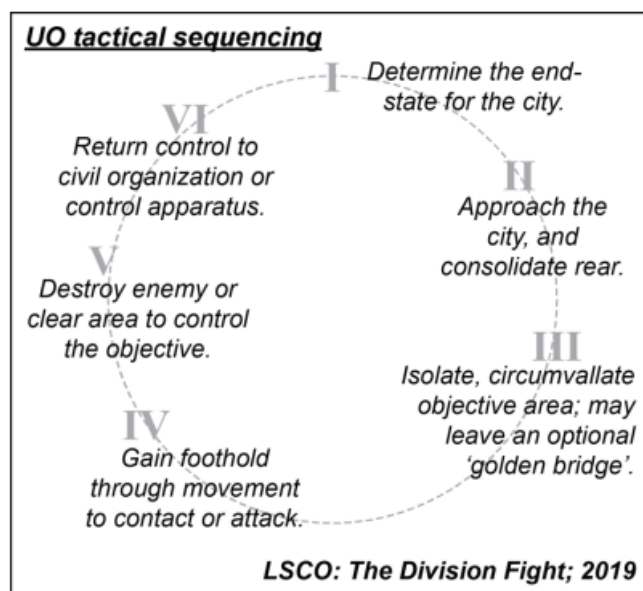


Figure 9: Urban Operations Tactical Sequencing (from ATP 3-06,2022; Fig 2-2)

There is also a table of planning force ratios and frontages for attack and defence (Figure 10), and for rates of advance (1 block = 175m, minimum values apply to densest areas – UK AFM Vol. 2, 2009).

Open or rural terrain force ratio (ATP 2-01.3) (friendly: enemy)	Typical mission	Urban operations restrictive terrain force ratio (friendly: enemy)
1:7	Delay	3:7 to 5:7
1:3	Defend (prepared)	1:1 to 5:3
1:2.5	Defend (hasty)	3:2 to 2:1
2.5:1	Attack (hasty positions)	8:1 to 13:5
3:1	Attack (prepared position)	9:1 to 15:1
1:1	Counterattack (flank)	3:1 to 5:1

Table 5-2. Approximate defensive frontages and depths

Unit	Frontage (Blocks*)	Depth (Blocks*)
Battalion	4 – 8	3 – 6
Company	3 – 4	2 – 3
Platoon	1 – 2	1

*Average block is 175 meters (191 yards)

Figure 10: Typical and urban operations planning force ratios and defensive frontages (from ATP 3-06, 2022; Figs 5-1 & 5-2)

FM 3-0 Operations was most recently revised in 2022 with a significant rewrite (US Army, 2022). Shape and Prevent have gone (as chapters) and been replaced by chapters on Operations During Competition Below Armed Conflict, Operations During Crisis, Operations During Armed Conflict (including LSCO) and Army Operations in Maritime Environments. The concept of Multi-Domain Operations is introduced but doesn't dominate. One paragraph refers to urban, and directs to ATP 3-06. It directs that "Avoiding urban areas during large-scale combat through deception or other means is ideal, but generally not possible" (§1-48), with commanders allowed to conduct urban operations with the same caveats as before.

The Evolution of UK Urban Doctrine

The issue with researching the urban doctrine of almost every country other than the USA is that the USA is the only country that as a matter of course aims to make doctrine available for public release. Almost every other country has a far lower threshold at which doctrine becomes classified and so not available to researchers or this PhD for analysis and publication. In addition (and possibly as a result) far more has been written already about the evolution of US doctrine and so there are good secondary sources to consult, but again this appears to be missing for other countries.

As a result the analysis of the evolution of doctrine in the UK, and in the other countries and organisations considered below will be far more patchy than the US coverage, but can hopefully be evolved over time as new primary and secondary sources come to light.

Pre-World War II

“The true revolution in the British Army was the adoption of Field Service Regulations in 1905. It was this that turned the British Army into a doctrinally based organisation” (p.7)(Pugsley, 2011). That change was presaged by the manuals *Infantry Training (Infantry Training (Provisional) 1902, 1902)* and its successor *Combined Training (Field Service Regulations. Part I, 1905)*. *Infantry Training (1905)* includes chapters on skirmishing and sections on close and open order columns, but nothing on urban fighting – it still seems to come from an era of linear warfare. *Field Service Regulations, (FSR) Part I Operations* (at least in the 1909, amended 1912) edition includes a whole chapter on Siege Operations, including masking a fortress, investment, bombardment and capture. There is nothing on urban areas as such, and this was unchanged in the 1914 amendments. *The Division in Attack* (1918) makes no special mention of or provision for urban areas. *Field Service Regulations, Volume II, Operations* (1920) has an entire chapter on Position (i.e. trench) Warfare, but has lost the chapter on sieges. *FSR (1929)* merges the positional warfare information into the attack and defence chapters (under trenches and protracted defence), and has at least retitled the chapter on “Warfare against an Civilised Enemy” (which in 1905 was “Formations Applicable to Savage Warfare” as “Warfare in Undeveloped and Semi-Civilised Countries”. *FSR (1935)* reintroduces the Position Warfare chapter, and now also has one on Special Types of Warfare, which includes deserts, mountains, forests and “uncivilised” warfare, but still fails to cover urban, which is also not mentioned in Volume III, Operations - Higher Formations. *Section Leading* (1928) has no mention of villages or urban areas.

1937's *Infantry Training. Training & War* manual (*Infantry Training, 1937*)(250pp) includes 2 pages on the defence and attack of villages. Attacks are “*similar to those for attacks on woods*” (p.191), with isolation being advised for small villages. Fighting amongst houses is “slow and exhausting work”, but shouldn't be allowed to hold up progress on the flanks, and may ultimately be dealt with by reserves. In the attack the village or town should be divided into areas and each allocated to a sub-unit, and subject to an intense bombardment before attack. When advancing down a street soldier should keep to both sides (later WW2 doctrine suggests just the enemy side), but it is accepted that moving through back gardens might reduce casualties. Field artillery was to be used in close support and at very short ranges. The reader is pointed to more detail in *Infantry Section Leading (Infantry Section Leading, 1934)* – but that only has a page and a half, much duplicated by the 1937 manual, and advises the single (right hand) side of the road approach! In defence, loopholing and wall breaches to enable safe lateral movement are advised.

World War II

UK urban doctrine for World War 2 seems to fall broadly into two camps, those meant for the home guard and home defence unit (particularly in the early war) and those intended for regular field army (particularly from 1943 onwards).

Home Defence Publications

The Defence of Bloodford Village (Wade, n.d.-a) was written by Col. G. A. Wade M.C. and

published by HMSO as a 16pp guide to the Home Guard on how to defend a village. Col Wade served in the South Stafford Regiment in World War One in France and Palestine (Curry, 2016). It is written in a very informal style as a look back on a famous defence of (the fictional) Bloodford village, using the same series of dreams approach of *Defence of Duffer's Drift* (Swinton, 1904). The pamphlet identifies 28 key learning points, including: the importance of road blocks, watching for the fifth column, using dummies, attacking through backyards, getting as close as possible to enemy tanks, and the importance of the counter-attack.

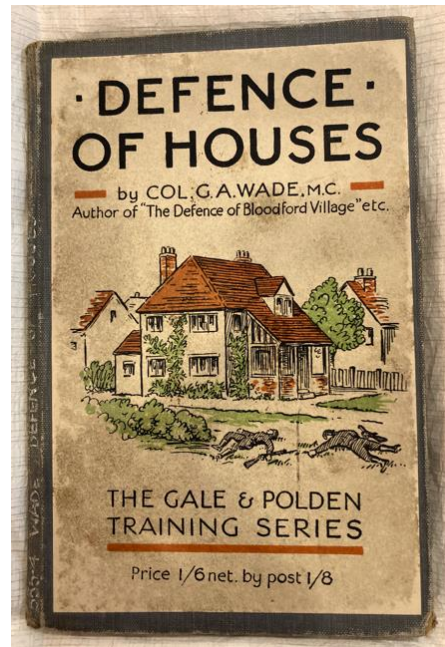


Figure 11: *The Defence of Houses* (Wade, n.d.)

Defence of Houses (Wade, n.d.b) is one of a series of unofficial training pamphlets published by Gales and Polden during World War 2 – many written by Wade to expand upon the ideas in *Bloodford Village*. This c.40 page booklet was published some time in 1939-43 and provide tactical (squad/platoon) information on how to defend houses and the immediate nearby streets. It is amply illustrated. In its opening summary it states that “*when invasion comes ... most stubborn fighting in built-up areas ... tanks hate houses*” (p.3). It then goes on to describe the choice of house to defend, the need for mutual support (“*three supporting is worth twelve independent*”) and all-round defence, engineering improvements, dummy defended houses, loopholing (including through ceilings, internal walls, floors and even bayonet loopholes), and gas-proofed rooms. It also states that the defended house is “*not a place to await the enemy*” but should be the “*centre for activity in surrounding areas*”, concluding with “*let your defence be active – go out and hit the enemy first – keep hitting him as he draws near to your defended house*” (p.39).

The Defence of Villages and Small Towns (Wade, n.d.c) (c.1940 given the context) is the next in Wade’s series for Gale and Polden with an urban focus. This 28pp booklet is essentially the next level up from *Defence of Houses*, and examines how the German’s might attack (and a “spirited defence” might cause them to give it a miss), vital parts/facilities to defend, establishing strongpoints (called “keeps”) and road blocks, fighting patrols, an active defence and defence “depth in time”. A Home Guard company is assumed to be in defence of the village.

Wade also wrote booklets in the same series called *House to House Fighting*, *Road Blocks* and *Factory Defence*.

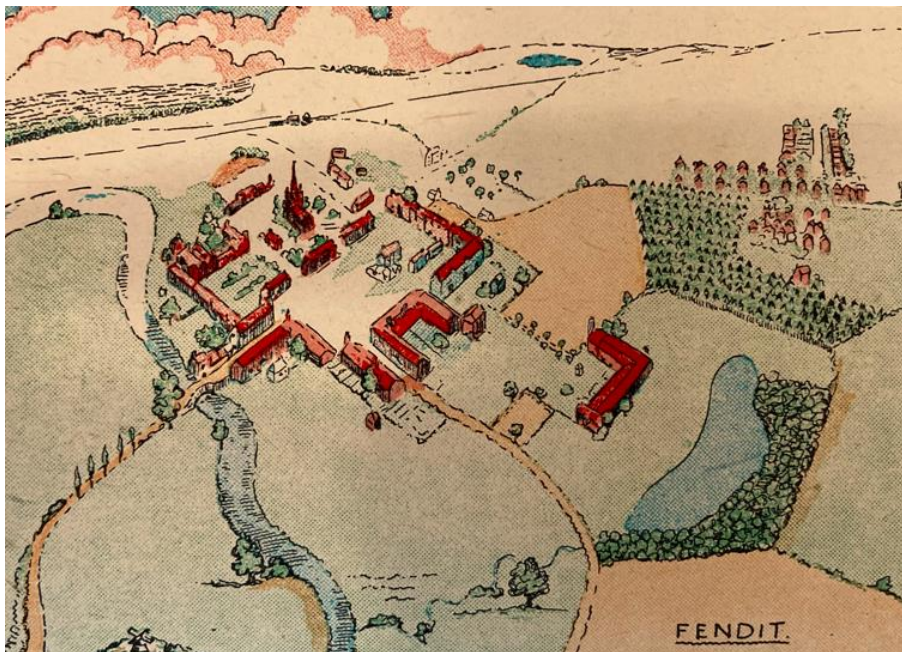


Figure 12: The Village of Fendit - to be defended in *Defence of Villages and Small Towns* (Wade, n.d.)

We shall fight in the streets: guide to street fighting, ground-defence-attack-use of explosives-arms and equipment-training-exercises (Cuthbert, 1941) is a 61pp booklet from Gale and Polden with similar coverage to their other World War 2 books on urban fighting. Interestingly, given comments below, it notes that “*German street-fighting tactics are based on an attack from the rear*” (p.4) – and hence the importance of all-round defence. It also has a useful table (reproduced from F.S.P.B. Pamphlet No. 4. 1939 Amendment 1 (December 1940) of the defence value of different construction and material types against small arms, bomb splinters and anti-tank weapons. *Field Service Pocket Book (F.S.P.B) Pamphlet no. 4, 1939 : field engineering (Field Service Pocket Book. Pamphlet No. 4, 1939, n.d.)* includes a short section on preparing buildings for defence.

Notes on the defence of nodal points and villages (Notes on the Defence of Nodal Points and Villages, 1941) is 9 page pamphlet then classified SECRET which describes how the UK was to be defended by a set of Nodal Points (based on villages) against a German attack. Such nodal points “*consist of strongly defended localities at road junctions or on important main roads with the object of denying these roads to the enemy, and to form centres of resistance as pivots for counter attacks*” (p.1). It’s discussion of keeps, road-blocks and defence in depth aligns with Wade’s booklets – which one assumes were informed by it. The pamphlet notes that “*Shot guns, loaded with S.S.G. [special small game] are probably more useful than rifles in street fighting and for use at night*” (p.5). The document also reports on a trial held near Ashford, Kent of the ability of tanks (a Mark II Infantry tank and a light tank) to cross a variety of anti-tank obstacles, including concrete “pimples” and “buoys” and bent railway rails – all found to be viable obstacles.

There was also a *Local Defence Volunteers Training Instruction No. 1 Road Blocks, Defence of Villages, 1940* and a *Home Guard Instruction No. 27 Defence in Urban Areas (1941, 26/GS Publications/338)* and *No. 57 Town Fighting* (Armatys, 2022).

Field Army Publications

Fighting in Built-Up Areas (Military Training Pamphlet No. 55, 1943) was the formal statement of British urban doctrine. No earlier equivalent has yet been found. It starts from the view that “*built-up areas favour the defence*” (p.1) and identifies two principal ways in which urban fighting is different: the ground and civilians (two of the US urban triad). In terms of ground it highlights the value of short-range weapons, the problems of control and visibility, the conspicuousness of movement, the difficulty of locating fire, the importance of height, the danger of looting and the

danger of fire. In terms of civilians it discusses the problems of control, fifth columnists, evacuation, leveraging local skills, knowledge and expertise, and the need to anticipate any sudden movements by civilians in response to bombing (which will drive them out) and fighting (which may drive them back in). The manual covers both the regular army and Home Guard. Whilst noting that tanks can *"suffer from certain disadvantages"* in towns it says that *"nevertheless, their armour and weapons can on some occasions be used with great effect"*, particularly in reducing strongpoints, and even crashing through building walls to afford entry for infantry. It is the task of infantry and artillery to neutralise or mask anti-tank weapons. Artillery is also seen as being *"limited in scope"* within the town, with roles including covering enemy approaches to the town after their successful break in, targeting prominent buildings (but mindful that it is hard to identify our own forward line of troops), and in a direct fire role against strong points. Anti-tank guns should similarly be used against buildings and *"their destructive powers amongst buildings is very great"*. It also notes that *"the moral effect of flame-throwers is great"* and are *"a very effective additional weapon when entering and clearing houses"*.

In the attack, the doctrine is for a three phased attack:

- Gaining a footing in the town proper;
- Progression within the town; and
- Reduction of individual centre of resistance.

A frontal attack with gradual double envelopment is seen as the best form of attack once a footing is made, with options being for narrow frontages converging, a broad front, or single, successive axes in order to divide the town up. There is no mention of the later US doctrines of isolation and attacking from the rear. At a tactical level movement through back gardens, roof-tops, mouse-holing and tunnels are seen as preferable to movement along the streets. In defence it is noted that even a small town of one square mile will be impracticable for a full perimeter or even area defence and that strong independent and self-supporting localities should be defended, based round the most vital terrain, and from which offensive operations can be launched. It is emphasised that *"It must be the object of the defence not merely to repel an attack but to destroy as many of the enemy as possible."* The manual concludes with a chapter on minor tactics (broadly similar to Wade's work) and training, a simplified table of the protection given by different materials against LMG fire and HE splinters, and a set of town maps and aerial photographs showing different urban layouts – the examples are all from France and Germany including Valenciennes, Montigny, Cambrai, Douai, Maastricht, Aachen, Mainz, Hamburg and Dusseldorf.

Battle Drill and its evolution is a locally produced, 178pp typed foolscap book by the Canadian Calgary Highlanders, and is an adapted version of a work by the 47 Div (London) Battle Drill school (47 Div (London) Battle-Drill School, n.d). It opens by saying that *"the close order drill now taught on dozens of barrack squares is the BATTLE DRILL of the past ages – the way men used to fight in practise in the campaigns which culminated at the Battle of Waterloo"* and that the new object was *"to concentrate on TEACHING AND PRACTISING out infantry sub-units in the INTRICATE and SCIENTIFIC business of the TEAM WORK of forward infantry fighting, and to teach the more senior infantry officers how to plan and direct this fighting"*. Indeed the whole manual has the feeling of a grass-roots rebellion against more official doctrine. The manual is focussed on Platoon and below tactics. There are 4 pages on "Drills for Village Fighting and House Clearing". A process is described on the platoons in a company being assigned sectors of the village, a SEAL being placed at the far end of the village and then the clearance starting. The main streets were to be the killing ground and *"anyone entering them will be shot"* (p. 72). Houses are to be cleared from the rear to drive occupants onto the street, and then from the top down. Soldiers are warned not to get too "windy" about using grenades – they should be conserved, but as many as possible should be carried, and they are also advised to *"KILL – Don't take prisoners, they are a nuisance in this sort of operation as they cannot possibly be lugged around from house to house."* It also considers that any civilians will be found alive in houses defended by the enemy, and any which seem like civilians *"are most likely to be enemy attempting to escape in this guise: YOU CANNOT AFFORD TO TAKE CHANCES IN THIS SORT OF OPERATION"* (p.74)!. It also advises that defended (as against abandoned) villages are unlikely to be boobytrapped, and that anyway your average soldier is unlikely to spot them anyway to *"so go right ahead and take the risks – until something happens"*. At a more operational level the manual also talks about "area warfare" and how towns

are likely to form important elements of a nodal style defence plan.

Cold War

Infantry training. Volume IV : tactics : infantry section leading and platoon tactics (Infantry Training. Volume IV, 1950) (116pp) includes an 8 page chapter on “House Clearing and Street Fighting”. Defence is described as using strongpoints in depth and street blockades, and with enemy tanks which “*may be dug into houses*”, with anti-tank guns in or outside of buildings or even on upper storeys (lessons from World War 2). Rooms may be mouseholed. Boobytraps are again advised as being more likely in undefended towns, or parts of towns. For the attack, it must be carried out in the greatest detail and in (military) depth. The town is divided into sectors, each assigned to a company. Bounds may be as short as one house. In heavy opposition a whole platoon, rather than section, is needed on each side of a street, with the platoons sections leap-frogging each other house by house. Back streets and side streets are preferred to the main street. Every house must be cleared and consolidated. Equipment should be light (later doctrine suggests wearing plimsols!) Casualties are to be left in houses for clearance by stretcher-bearers following up. Artillery is “of little direct help”, but useful in softening up. Tanks are employed a troop to a company, and only called forward for specific tasks, such as clearing houses, rubble-heaps (shades of Ortona again) and strongpoints. Anti-tank guns and self-propelled artillery can be similarly used. Flamethrowers are also considered to be “most effective”. House clearance is preferably by the roof, but if by the ground the attackers should not seek to try to move up to the top to try and clear down. Civilians “*will usually go to ground in cellars and only prove an embarrassment when the fighting is over*” (p.112). “Windy” grenade users are now replaced by being “grenade-minded”. Church towers must be cleared. The 2” mortar is useful for smoke and for putting HE through windows.

British Army of The Rhine, Instruction on the Defence of a Large Built-Up Area Close to a Major River Obstacle (British Army of the Rhine Instruction on the Defence of a Large Built-up Area Close to a Major River Obstacle, 1952) is a then TOP SECRET 3pp document from BAOR. The document accepts that the Warsaw pact may gain footholds in large built-up areas, but that:

“it should be possible so to dominate that area that he is unable to obtain a bridgehead of sufficient size to allow a build-up for a major breakout. The enemy's operations in a defended, built-up area will be so slow and difficult that he may well consider them not worthwhile as soon as he is certain that he cannot obtain an easy success. To show considerable strength forward in a built-up area may well act as a strong deterrent to the enemy from attempting to cross the river into that area.” (p.2)

The document also notes that within “*sectors it will be impossible to produce a solid defensive layout; Units are bound to be somewhat isolated. The smallest unit to have an integrated cohesive defence scheme under these circumstances is the battalion. Even in the battalion it will be impossible to provide for a continuous occupation of its area, and some gaps between comma companies must be accepted comma but the whole battalion area must be mutually supporting with no isolated detachments*” (p.2)

As in the Second World War publications there is a directive that the defence should not be static, alternative positions should be established and the enemy “*continually kept guessing and surprised*”, without counter-attacks making use of “*covered ways*” and mouseholing. Artillery is seen as “far less effective” once the enemy is in the town, but can be used to destroy buildings occupied by the enemy. Generally Fires should be used against reinforcements – isolating the town by Fires. Direct fire by tanks and anti-tank guns is seen as “*extremely valuable ... provided they can be brought into position*”, and can be sited in buildings before the battle starts. Flame-throwers, both manpack and vehicular, are also seen as “*particularly valuable against an enemy who are holding houses*”. However, the document advises:

“It will very seldom be a wise thing to leave the cover of the houses in order to launch a counter-attack on buildings occupied by the enemy. It will always be difficult for any force to occupy all the

buildings in its area and often the most profitable course to the defender will be to occupy houses on' the flank or rear of the enemy, from which he can be continually harrassed, and the expansion of his bridgehead be prevented." (p.3)

The Kings College collection of British Army Field manuals includes the following items, but they have not yet been examined (*BRITISH ARMY FIELD MANUALS*, 1963-2004, 2024):

- Army Field Manual Vol 4: Part 5: fighting in built up areas, 1983 (Box 9)
- Army Field Manual Vol 2: Operations in specific environments Part 5: urban operations, 1999 (Box7) – was also updated in 2004(?).

British Military Doctrine (1989) "*broke new ground in the British Army's understanding of its profession. For the first time the Army had an explicit description of the overall philosophy and principles by which it should operate*" (*ADP - Land Operations*, 2005) (p.i) – although as can be seen above British Army doctrine dates all the way back to 1902/1905. In the 1996 (minor) revision of the document (*Design for Military Operations - The British Military Doctrine*, 1996) there is no mention of urban, despite a "modern" characterising of the battlefield as being continuous through day and night, extending to the information domain and being multi-dimensional (in an MDO sense with Deep, Close and Rear battles and in EW). There may be an ADP publication on Land Operations associated with the 1989 BMD but this has not yet been sourced.

The Troubles

In June 1973 HQ Northern Ireland undertook a study into the patrolling of urban areas – but it seems unpublished, probably classified (*Patrolling in urban Areas, A Report of a Study Carried out by HQNI. June 1973*).

War on Terror

ADP Land Operations (*ADP - Land Operations*, 2005) replaced both the 1989 *British Military Doctrine* and its 5 supporting volumes of ADPs. It lays out a manoeuvrist approach, attacking the enemy's understanding, will and cohesion. However, urban is only (and briefly) mentioned in the context of insurgencies and terrorism.

Army Field Manual Vol 2: Operations in specific environments Part 5: Urban Operations (*Urban Operations*, 2009) is a 227pp document and laid out British urban doctrine after many years of fighting in the Iraqi Insurgency. However, it warns that:

"The Army will need to be cautious about drawing general conclusions from urban operations in Basra and Baghdad. Unless all or most of the favourable factors apply in a future operation, the result could be very different. There is considerable reason to continue to teach tactics for urban operations in the anticipation that it will not be so easy, whilst stressing the need to be pragmatic and to exploit local circumstances" (p.i)

As well as noting how urban battles are likely to degenerate into small group combats it also reflects the "great equaliser" view,:

"Historical data suggest that it is extremely difficult for modern forces to make best use of their technological advantages against a determined adversary in an urban environment. The different characteristics of the various urban environments, including population and structure density, low, medium and high buildings, subterranean structures et al, tend to negate the technological advantages (e.g. close air support, mobility, communications, etc) enjoyed by modern military forces. The advantage of military technology, typically associated with long-range, high technology weapons platforms that use mass and mobility, is significantly reduced in urban environments." (p.ii)

The document splits into 3 parts:

- Part A - A description of urban warfare, coalition operations and the interaction with the civilian population;
- Part B - Fighting the urban battle at unit and formation level; and
- Part C - Fighting the urban battle at the section and platoon level.

Part A opens with a quote from General Krulak, USMC – “*the future of war is not the son of Desert Storm, but the stepchild of Chechnya*”, setting quite different tone from opening with the classic Sun Tzu quote. It does though suggest that urban is the great leveller - “*Experience over the last decades has shown that the advantage of conventional armed forces is largely negated in the urban environment*” - (p. A-1-2), and that it may be an element of hybrid/grey-zone warfare. In terms of offensive operations it proposes three approaches:

- Penetration – against clearly defined objectives to be held (recommending 5:1 or 6:1 attacking ratio to capture and hold a city);
- Thrust – a narrow axis to dislocate the enemy and force them to withdraw; and
- Saturation – dispersed, non-contiguous operations.

Defensive operations are described as being mobile and exploiting depth, with planning ideally detailed and centralised and informed by a detailed IPB. Three phases are described:

- the perimeter battle;
- the disruption battle; and
- the Main Defended Area (MDA) battle.

Six UTZs are identified (in addition to “villages”):

- City core;
- Commercial ribbon;
- Core Periphery;
- Outlying areas (incl residential sprawl and industrial areas);
- Subterranean; and
- Historical city centre.

In describing building construction the difference between heavy clad framed buildings (i.e. concrete frame with brick or block in-fill walls), light clad buildings (with thin brick, concrete or glass) and open framed buildings (i.e. multi-story car parks). Table 1 below details the various building types (drawn from *Military Engineering Volume II Pamphlet No 2 Field Fortifications, Chapter 8*) and describes them in terms of their characteristics and potential use for defence.

Construction	Examples	Characteristics	Advice
Post and Frame	Old farm houses & cottages	Wood, with some brick/stone infill	Avoid
Masonry	Town halls, banks	Solid, may require some propping	Good is not isolated
Good quality brick or concrete block	Detached and semi-detached houses	May still needs sandbags and props	Good
Low quality brick	Terraced houses, shops	Easily demolished by direct fire. Cellars may be useful.	Avoid except for cellars
Large Commercial – modern	Department stores, factories, offices	Light clad frame buildings	Possible if reinforced
Large Commercial – older	Department stores, factories,	Brick built	Good

	offices		
Medium/high rise concrete block – offices	Offices	Light clad frame buildings	Possible if reinforced
Medium/high rise concrete block – apartments	Apartments	Heavy clad frame buildings	Possible
Single floor industrial	Warehouses and factories	Light clad frame buildings	Need substantial work, but provide cover from view

Table 1: Building Types adapted from AFM Vol.2 Urban Operations, 2009

The presence, status and impact of and on civilians, and military responsibilities for them is also discussed, but there is no explicit mention of the US urban triad.

Part B considers the urban battle at the unit and formation level. It considers that at both formation and battlegroup level there should be enhanced resources for ISTAR, human terrain mapping, influence operations, Fires, and urban training. A manoeuvrist, approach to urban combat is the primary model, with attrition only if necessary or unavoidable. A minimum attack ratio of 3:1 is sort. There are separate chapters on IPB, ISTAR, C3, EW, and all-arms. In terms of all-arms the urban battle is described as favouring close combat by dismounted troops, although AFVs can provide a “*higher level of fire support and logistic backup*” (p.B-5-2). Urban close combat is defined as “*operations which take place on foot, in direct fire contact with the enemy and involving the deliberate application of concentrated violence to achieve the mission*” (p.B-5-2), with combat ranges expected of 200m down. The use of grenades (including UGL and the Grenade Machine Gun (GMG)), mortars and snipers are described, and there is a chapter on the active employment of AFVs, tanks and ATGWs. The use of the single-use tandem-warhead Anti-Structure Munition (similar to NLAW but optimised for use against buildings) which was then about to enter service is also briefly described (the Matador system was eventually chosen for this and is still in service, allocated at 1 per section – see <https://www.battleorder.org/british-rifle-platoon-2019>). The use of Fires is described, including precision-guided munitions (including GMLRS with a 40m lethal splinter radius and ~10m accuracy), and the anticipated arrival of a loitering munition (Exactor, based on Spike NLOS, entered service in 2010) for more precise targeting of stationary and mobile targets. The role of the Engineers in each of the 3 approaches to offensive operations, and in defensive and stability operations is also described. In terms of fixed wing support the document notes that “*The compressed battle space in the urban environment increases the difficulties experienced under the planning and conduct of ‘traditional’ Close Air Support (CAS) aircraft operations. Targets are hard to locate and identify, non-combatants and both enemy and friendly forces could be intermingled, there is a significant risk of fratricide, and enemy short-range air defence weapons are hard to suppress*” (p. B-5-39). There is a chapter on Combat Service Support, ammunition expenditure is expected to be at least twice that of non-urban operations, and water consumption upto 2.5 times normal.

There is a useful section on recent lessons identified (correct terminology for once!), principally from Fallujah which includes:

- It took around 90 minutes to clear a two-storey house – if fire support was not used. Top down was preferred
- Tanks proved vital in providing immediate fire support and suppression capability.
- CAS was insufficiently reliable but was good for destroying structures – although the AC-130 was rated.
- CASEVAC required hardened vehicles.
- Methodical and slow (‘swamp’) clearance proved more effective and reduced casualties, in comparison to penetration/thrust where insurgents were missed and were able to attack troops from behind.
- The tactical pause became an essential part of the battle rhythm, allowing control to be re-established and CASEVAC and re-supply to take place.
- Even with a fully night capable force, the US chose not to fight at night due to the

problems of fratricide and command and control.

- Tank communications proved vital in providing a link back to company HQs from squads on the ground.
- The infantry/tank telephone was extensively used.

There are then dedicated chapters providing more detail on Conventional Offensive Operations, Stability Operations and Conventional Defensive Operations, the latter repeating the frontages table from US Doctrine shown in Figure 10, as well as warning about the threat from Enhanced Blast Weapons (EBWs) such as the TOS-1, RPO-A Schmel and RShG-1 thermobaric weapons.

Part C examines lower level urban combat skills, including concealment, fighting positions, mouseholing, movement, entry and clearing techniques (a platoon per building task), breaching, strong points, navigation, casevac and ammunition resupply. Chapter 10 deals with weapon effects and provides useful data on the penetrative capabilities of modern British Army weapons, summarised in Table 2. The chapter includes the specifications for the C13 CS grenade, which is stated to be effective to 25-35m, depending on wind.

Weapon	Penetration	Notes
5.56mm @ < 50m	5cm concrete (not re-inforced), can or drum of sand, cinder block, brick veneer, car engine block	
7.62mm	<i>“penetrative qualities .. are significantly greater than those of 5.56 mm ball.”</i> – see table below	“
12.7mm/0.5”	36cm of sand or 71cm of packed earth	Less affected by range
L109A1 Hand grenade		Incapacitate protected man at 5m, unprotected at 20m
UGL 40mm grenade	45mm steel, 30cm concrete	Casualties to 5m
GMG Grenade 40mm grenade	50mm steel, 35cm concrete	Casualties to 5m
NLAW		Not given. Fire to side of opening to detonate.
Javelin	150cm of concrete or sandbags	Over-pressure, but small entry hole – not a breach. Fire to side of opening to detonate.
ASM/Matador		Not given
30mm		Not given, HE round preferred
120mm		Not given, HESH preferred
60mm Mortar	Unlikely to penetrate rooftops.	
81mm Mortar		Not given
105mm		Lethal radius 40-50m
155mm		Lethal radius 55-85m
GMLRS		Lethal radius 80m+

And for 7.62mm ball:

Range (metres)	Pine Board	Dry Loose Sand	Cinder Box	Concrete
(a)	(b)	(c)	(d)	(e)
25	33 cm/13 inches	13 cm/5 inches	20 cm/8 inches	5 cm/2 inches
100	46 cm/18 inches	11 cm/4.5 inches	25 cm/10 inches	5 cm/2 inches
200	104 cm/41 inches	18 cm/7 inches	20 cm/8 inches	5 cm/2 inches

Table 2: Penetration Capabilities of modern British Army weapons (derived from AFM Vol.2 Part V Urban Operations, 2009)

Further chapters deal with subterranean operations, night operations and the use of obstacles. Overall, *Part 5: Urban Operations* seems a pretty solid manual on urban operations, without too much emphasis on COIN type operations, and certainly still directly relevant to LSCO.

ADP Land Operations was updated in 2010 and is a fairly full rewrite. It still emphasises mission command and manoeuvrist, approach, along side considerations of the conceptual, moral and physical components of fighting power. It also includes a 25pp essay by Dr Gary Sheffield on *Doctrine and Command in the British Army: An Historical Overview*. The character of conflict is for the first time defined as being congested, cluttered, contested, connected and constrained – the 5C's and all highly relevant to urban, and many using urban examples. Under congested the ADP says *"Forces cannot avoid being drawn into operations in the urban and littoral regions, where the majority of the global population lives, and where most political and economic activity is concentrated"*, although it then places that within a COIN context with *"Therefore the ground is often densely populated, frequently by dissatisfied and disadvantaged people, a number of whom will be armed, living in conditions of physical hardship"*. Otherwise urban gets no real specific mention. The 2010 Future Character of Conflict expanded on the 5Cs to help describe the characteristics of the joint battlespace in 2014 and 2029.

A 2011 Exercise Urban Warrior II Final Report, quoted in the 2012 *Future Land Operating Concept* (FLOC) (JCN 2/12: *Future Land Operating Concept*, 2012), found that *"The requirements of the complex urban environment are markedly different from those of less fettered, open warfare. Changes in structure, doctrine and concepts will require corresponding adjustments in equipment and training. In turn, these will require investment in infrastructure and simulation in order to be able to train"* (p.2-21). The Urban Warrior II report from the same year, and quoted in Agile Warrior 2012 (Agile Warrior 2012: Summary of Insights, 2012), said that:

"We will not want to fight in urban areas, but the urban environment represents in my view a highly credible worst case – and we would be foolish indeed to plan to fight only convenient battles against stupid adversaries. Urban areas are where politics, people, resources, infrastructure and thinking enemies converge".

Exercise Agile Warrior 2011 was the first of a series of exercises held to *"deliver an evidence-based analysis of future land force requirements, with associated recommendations, to inform and drive land force transformation"* (Agile Warrior 2011: Summary of Insights, 2011). In terms of urban its findings were:

- "The Army is not ready, in both preparedness and capability terms, for the demands of future operations.
- Emerging findings already suggest that the role of armour will need to change in high density urban operations in order to support the infantry.
- In urban operations amongst the people, land forces may have to increasingly decentralise forces, by design. Such an operating environment will place significantly greater demands upon commanders and soldiers to understand the nature of emerging conflicts.
- Greater investment in urban training will be required ... Simulation will play a part, but consideration should be given to partnering of urban facilities, possibly with France.
- Provision of Combat Service Support in this nonlinear battle space will require further study.
- The equipment programme needs to focus more on the demands of the 5Cs and the urban environment".

In terms of wargaming, the same report identified that *"is a powerful tool which is currently not well understood and therefore somewhat neglected ... We currently treat wargaming as an unstructured review of our plan or available courses of action- it is, more often than not, a self-analysis or talk through to identify weaknesses or confirm our comfort with our own decisions and reasoning. We need rapidly and radically to re address our understanding and use of this very powerful tool and to resource it appropriately."*

Agile Warrior 2012 had operations in urban environments as one of its 8 headline themes, and fed into the Army 2020 programme. (Agile Warrior 2012: Summary of Insights, 2012). Two main activities informed the work. Ex Urban Warrior3 (quoted above) which was an experiment conducted on the ground in city of Southampton "to examine operations in an urban environment, at formation level, in order to improve understanding of the demands of future urban operations, in

a 2020 time frame". Second, a RSUI Study Group was convened to look at urban operations, and its report on *Urban Operations – How the Military Can Contribute to Achieving Effect in the Urban Environment* identified that "Demographic shifts to cities mean that these locations will become pivotal points for influencing regional, national and global risks; not least because cities attract extremists, terrorists and organised criminals as well as being the nexus point for different cultures, ethnicities, trade flows, and supply chains". (JCN 2/12: *Future Land Operating Concept*, 2012)(p.2-2). Agile Warrior 2012's recommendations were:

- "Recognise that it is more likely than not that the Army will be required to fight in a city within the next 10-15 years.
- Prepare and employ combined arms brigades, with expeditionary and mobile headquarters for manoeuvring to seize the tactical initiative.
- Invest in the divisional level, where operational art should be practiced using a comprehensive approach.
- Re-mechanise. Beyond 2020, ensure that the equipment programme includes a capable main battle tank, an armoured reconnaissance vehicle, an armoured artillery piece and armoured vehicles for armoured and mechanised infantry; with command and support vehicles to match, in order to ensure the necessary levels of firepower, protection and mobility.
- Move from assured to confident targeting, based on judgements, the law and accountability, rather than mechanistic processes.
- Invest in specific preparations for operating in urban areas: inter alia, intelligence awareness of the terrain; a method for simplifying the common operating picture; communication that works in built up areas; psychological inoculation of personnel; and tactical training for fighting in buildings and underground.
- Re-invest in logistics, medical and equipment support pushed forward and integrated with the fighting echelon.
- Ensure that aviation can operate effectively in urban areas."

In addition, the report identified that:

- "The demands and complexity of operations in the urban environment pointed clearly to the need. For a fundamental reappraisal of our approach to force preparation.
- The Army needs to develop methods for understanding the physical and social infrastructure, power relationships and sources of economic health in cities.
- Urban Warrior 3 confirmed the inadequacy of currently published planning yardsticks for operations in the urban environment.
- The utility of indirect fires in urban operations was confirmed. Non-explosive natures were also seen to have utility., e.g. marker and smoke. Further study is recommended to investigate how novel munitions could enable operations in the urban environment where avoiding collateral damage is a major factor.
- Urban communities will expect the provision of services in utilities that the Army is not quipped to deliver, either because of lack of capabilities or because land forces will have competing priorities.

In terms of forward work the report indicated that "To exploit the work of AW 12, UW3 and UW4, an Urban Concept and an 'Urban Roadmap' are being developed to identify the path through which the Army should develop its urban capabilities. URBAN WARRIOR 5 will examine the issue further in a series of live, virtual and constructive experiments in the latter half of 2012".

The 2012 *Future Land Operating Concept* (FLOC) (JCN 2/12: *Future Land Operating Concept*, 2012) has some significant urban coverage, talking about it in terms of climate change, megacities and urban sprawls and there seem to be strong links between Agile Warrior/Urban Warrior and FLOC 2012. The FLOC said "In the future, we will be unable to avoid being drawn into operations in the urban and littoral regions where the majority of the world's population lives, and where political and economic activity is concentrated" (p.2-2). Indeed, urban seems to have become the

default setting, viz. *“A focus on operating in the urban environment does not preclude the ability to operate in other complex and demanding terrain, such as in jungle, littoral and arctic conditions”* (p.2-21), although this is later rebalanced, along with a recognition of the value of armour in the urban, *“Land forces must prepare in capability terms for future operations in the urban environment. Experimentation has illustrated the use of armour in support of infantry in high density operations as well as the need to develop air manoeuvre doctrine in this environment. Greater investment in urban capability will be required, but this will have to be balanced against other capabilities”* (p 4-23). Understanding is seen as “pivotal” to operations, and particularly in urban operations and understanding how urban areas function. The 2012 FLOC was replaced by JCN 1/17, Future Force Concept in July 2017 which was an OFFICIAL SENSITIVE document and not released to the public.

During the 2010s there were at least a further 4 doctrinal publications on tactical urban fighting:

- “In 2011, a document called Pamphlet 3 – Operations in Built Up Areas (OBUA) was released featuring more advanced CQB tactics than the Army’s standard of the time
- In 2016, the Urban Tactical Handbook was published featuring tactics replicated from the Royal Marine CQB Instructors pamphlet
- Also in 2016, the Royal Gibraltar Regiment began to disseminate tactics notes for subterranean warfare heavily featuring CQB tactics for clearing tunnels and underground spaces
- In 2020, the British Army’s Infantry Battle School (IBS) published “slate cards” to support their Urban Operations Instructor Course (UOIC). These feature tactics that are different from that of the Urban Tactical Handbook and OBUA pamphlet
- Finally, there is the legacy of the Afghanistan-specific compound clearing drills” (Wimbush, 2021)

The Return to Large Scale Combat Operations

In 2014 MOD issued Future Operating Environment 2035 (Future Operating Environment 2035, 2014) – which set out “a comprehensive picture of the future” to inform future plans and doctrine, and sat alongside another document Global Strategic Trends out to 2045. The “urban and littoral” challenge was identified as one of five core characteristics of future operations (alongside technology, access – as in A2/AD, blurring of threats – both human and natural, and humanitarian and disaster relief. However, it saw issues of congestion and physical projection as possibly needing the UK to “conduct more of our activity remotely, or from a stand-off location, so that we do not become embroiled in lengthy and intensive urban operations. On occasion, however, we may have no choice but to operate in an urban area. This will be particularly true if our Armed Forces are called upon to conduct a non-combatant evacuation operation, hostage rescue or support a humanitarian operation within a city” (p.32).

In 2016 the British Army’s Land Warfare Centre published a new urban doctrine in *Operations in the Urban Environment Doctrine – Doctrine Note 15/13* (and a shorter *The Essentials* guide), however these documents are at OFFICIAL SENSITIVE and so cannot form part of this study.

ADP Land Operations, published in 2017 is one of the British Army’s “capstone” documents, emphasises the manoeuvrist approach and mission command (*ADP Land Operations*, 2017). Whilst there is no specific section on urban, the document does recognise the importance of urban – *“Globally, the phenomenon of urbanisation is creating physically, culturally and institutionally complex cities that are challenging for military forces operating in them. In the littoral, the complexities of the urban environment for land forces are amplified”* (p.1-3).

AFM Warfighting Tactics Part 1: The Fundamentals (AFM Warfighting Tactics Part 1: The Fundamentals, 2018) describes warfighting thus:

“Warfighting can destroy infrastructure, demolish homes, and turn metalled roads into dirt tracks, and shopping centres and industrial estates to rubble. The battle can increasingly be

expected to be in the littoral and in complex urban environments, potentially laced with rat runs and tunnels, hiding victim-operated devices and roamed by regular and irregular enemies; snipers, anti-tank teams, petrol bombers, agitators and civilians” (p.1-2)

There is almost an assumption here that the fighting will be urban, rather than urban being a special case – possibly the first piece of doctrine examined which takes that view.

In 2020 Dstl issued *Future Cities: Trends and Implications* (Bogan et al., 2020), a 103pp study report. This was triggered by the importance of cities identified in Future Operating Environment which led to “*a renewed push across the military to examine the uniquely challenging urban environment and how the UK military can best adapt to it. This has resulted in activities by Army HQ, Field Army and the Experimental Brigade to analyse specific activities or challenges within this environment, focused predominantly on the current challenges*” (p.vii). The new report sought to:

“bridge the gap between current urban operations doctrine (our present understanding of cities) with the endorsed future vision of DCDC’s Future Operating Environment (2035) and Global Strategic Trends (2050). The output from this report will help the UK military to determine where there are significant challenges on the horizon; allowing examination of potential options to mitigate, or better prepare, for these circumstances before they are encountered in a conflict or humanitarian/disaster relief setting” (p.vii).

It examines the “current and emerging trends in city development”, including rapid urbanisation, smart cities, the physical environment, infrastructure, demographics and actors; and then consider the military specific implications. It also looks at issues such as littoral cities, verticalization, urban mobility, urban mapping, automation, power supply, security infrastructure & CCTV and migration. It recommends that “*The UK should seek to demonstrate world-class urban operational capabilities. In particular to deter potential adversaries, who may be less assured of their ability to utilise the urban terrain advantage, from meeting their aims and objectives*”. Particular requirements identified are an improvement in the UK’s urban training facilities, especially for large-scale urban training (and also looking at virtual options), having urban as a consistent theme throughout soldier training, checking the suitability of all military equipment for urban operations, a consideration of an urban specific combat formation, and developing a database of urban areas where the UK is likely to operate – particularly in Africa and Asia. It concludes that since “*It is often thought that it is easier to adapt from urban to rural operations than vice versa*” and that “*the future operating environment is going to be increasingly urbanised*” then “*the UK military must consider this environment as a primary driver of capabilities*” (p.144).

A new Land Operation Concept (LOpC) was announced in 2023 but again appears to be classified (*Army Announces New Way of Winning Future Wars*, 2023). However, it apparently identifies four key challenges which are closely aligned to the urban setting:

- Exposed – the transparent battlefield due to the proliferation of sensors and precision weapons;
- Autonomous – both robotic and AI;
- Fragile – an increasing dependence on data, software and communications; and
- Observed – everything taking place in “a global goldfish bowl”.

The strategy adopted to counter these is proposed to be recce-strike, at every level, finding the enemy as far forward as possible and then destroying them. The importance of CEMA and the information environment is also stressed.

The most recent developments in UK’s informal urban doctrine will be considered in a later chapter.

NATO

Considering the capstone publications first, NATO doctrine sits above national Joint and Land doctrine. NATO’s *Allied Joint Publication-3 Allied Joint Doctrine for the Conduct of Operations* (AJP-3, *Allied Joint Doctrine for the Conduct of Operations*, 2019) sees that “*urban conflict*,

terrorism, and irregular forces with their inherent asymmetric characteristics are more commonplace” (p. 2-17). The documents focus is very much on the command and management of military operations, rather than their execution. AJP-3.2 Allied Joint Doctrine for Land Operations (*Allied Joint Doctrine for Land Operations (AJP-3.2)*, 2022) reflect the principles of mission command and manoeuvrist operations. It uses the Find-Fix-Strike-Model, dividing operations into decisive, shaping and sustaining, and geographical focus into deep, close and (own) rear. Section 1 in Annex A on operations in specific environments deals with urban (7pp). It states that “*As the centres of political, economic and social power, populated areas will be a key consideration at strategic and operational levels and the achievement of related objectives. Thus, tactical land operations can be expected to be conducted within or to influence urban areas*” (p.A-1). It discusses a system of systems model, noting that “*These systems within the urban environment are interconnected and effects to one will have reverberating implications to all. Conflict, at any scale, will magnify and stress any fragilities in these systems. Although urban environments will have similar characteristics and constituent systems in the larger sense, each urban environment will be unique*”. The section takes a high-level view of the physical, information and human characteristics of the urban environment, and the nature of the urban threat. In terms of force employment considerations, AJP-3.2 advises that commanders:

- “Maintain continuous understanding of the urban environment. This includes an understanding of the various systems within the environment, and how they impact on the achievement of friendly objectives and denial of the adversary’s objectives. It includes understanding the cultural and social expectations of the local populace.
- Prosecute operations targeting all urban systems – physical, information and human. All these must be considered and integrated in the planning and conduct of operations.
- Maintain a mindset of force agility. Forces must be able to transition quickly across the full range of tactical operations and activities, and quickly exploit the information environment to gain a superior narrative.
- Adopt a campaign mentality in terms of the duration of the operations and amount of resources required for their conduct.
- Maintain the integrity of the urban system. Collateral damages should be mitigated to the greatest extent possible” (p. A-5).

Allied Land Tactics ATP-3.2.1 (*Allied Land Tactics ATP-3.2.1*, 2009) provides more detail to AJP-3.2 across general warfighting. It has 8 pages in Chapter 9 (on Operations in Specific Environments and Circumstances) on built-up and urban areas. It summarises some of the key characteristics of urban warfare, describes the various urban terrain zones (a variation of the US and UK models), a 3 phase model of the urban attack (isolate, attack on and in, clearing), and a recognition that urban areas may not form part of a defensive if there is insufficient combat power available for their defence, protected status buildings (including heritage) make it impossible to conduct an effective defence, it is over-looked by high ground, or it has been declared an “open city”.

ATP-99 Urban Tactics was published in 2017, and *ATP-3.2.1.2, Land Tactical Operations in an Urban Environment* was published (or revised) in 2022, but it has not been possible to source a copy of either, however some reports on earlier work may give some indication of the direction of travel.

In terms of the evolution of NATO urban doctrine, a NATO Research & Technology SAS-030 report in 2003 looked at *Urban Operations in the Year 2020 (Urban Operations in the Year 2020 (RTO-TR-071)*, 2003). The introduction states that the report was the result of a 1999 study which found that:

“in the future it is likely that NATO forces will have to conduct operations in urban areas, i.e. where physical structures, non-combatants and infrastructure will be significant characteristics. Furthermore LO2020 concluded that such operations will pose significant challenges for the Alliance. Present capabilities for operating in urban areas are essentially those of World War II, which are characterised by high levels of casualties and extensive collateral damage. Currently NATO commanders have very few military options which would avoid serious damage and

casualties when dealing with an enemy in urban areas. Such effects are unacceptable, particularly at the lower levels of conflict, where NATO forces are more likely to become involved. Therefore, it is essential that NATO provides its commanders with a range of capabilities for dealing with the varying conditions of operations in urban areas” (p.iii).

The study was framed around the USECT model (for which it gives a full description) and identified 15 key capabilities, shown in Table 3 out of 42 total capabilities. The DOTM drivers refer to Doctrine, Organisation/personnel, Training/leadership and Materiel – a condensed version of the DOTMILPF framework.

NUMBER	CAPABILITY REQUIREMENT	DRIVERS
U 1	Process, format and distribute large scale data and information at improving the decision making process	M
U 3	Have an overall understanding of the international, regional and local situation and in context with other factors such as population, ethnic, cultural, political factions, other agencies, NGOs and other groupings	O, T
U 6	Determine intent, aim, location, movement, status, capabilities, support structure of potential enemy forces, neutrals, key players and population	M
U 7	Acquire an accurate understanding of the infrastructure, the systems and the dynamics of the designated urban area and their impact on operations (identify the key nodes and vulnerabilities)	M
S 5	Provide the appropriate level of mobility (surface/above surface/sub-surface, including under water) to operate effectively in urban areas	M
S 10	Establish, secure and maintain own forces support systems (logistics, medical, etc.)	O
S 11	Enable a force to use the battlespace within the urban environment to best advantage	D, T, M
S 13	Detect, identify and assess rapidly chemical, biological and radiological threats (this includes toxic threats)	M
S 14	Deny the enemy from operating effective C4ISTAR systems	D, M
S 18	Assure C4 interoperability for own forces	M
E 1	Destroy or neutralise in a timely manner, fixed or mobile point targets in the urban environment with minimum casualties and collateral damage	M
E 2	Provide and sustain combat power and maintain tempo of own forces	D
E 6	Establish a reliable Friend-Foe-Civilian Identification	M
E 8	Dominate the EM spectrum	M
E 10	CONDUCT CYBER OPERATIONS	D, M

Table 3: Top 15 Key Capabilities and DOTM Drivers (Table 6.1, RTO-TR-071, 2003)

The report also discusses some novel operational concepts for urban operations, as shown in Figure 13.

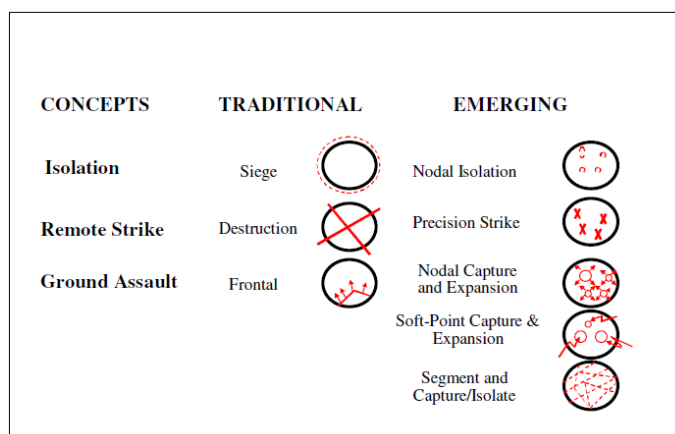


Figure 13: Some types of Operational Concept (Figure 4.2, RTO-TR-071, 2003)

Annex D to the report describes an “urban seminar wargame” to identify which concepts “were likely to provide the most military benefit during the conduct of urban operations in 2020, primarily at the operational level of command”. The seminar wargame was “in essence, a structured judgmental exercise to examine the possible application and value of new technologies used in postulated weapon systems. Experience has shown that this can best be done in the context of specific scenarios, as the interaction between equipment and specific military objectives prompts discussion and generation of insights”. Two scenarios were used (LSCO and OOTW), each with 3 vignettes to be discussed. As well as RED and BLUE syndicates there was also a WHITE syndicate “comprised of specialists from legal, media, psychological and people domains”. The technologies examined in the wargame, and how they rated on military and technical attractiveness are shown in Figure 14. Details of the scenario, based around Rouen, were provided in Annex E.

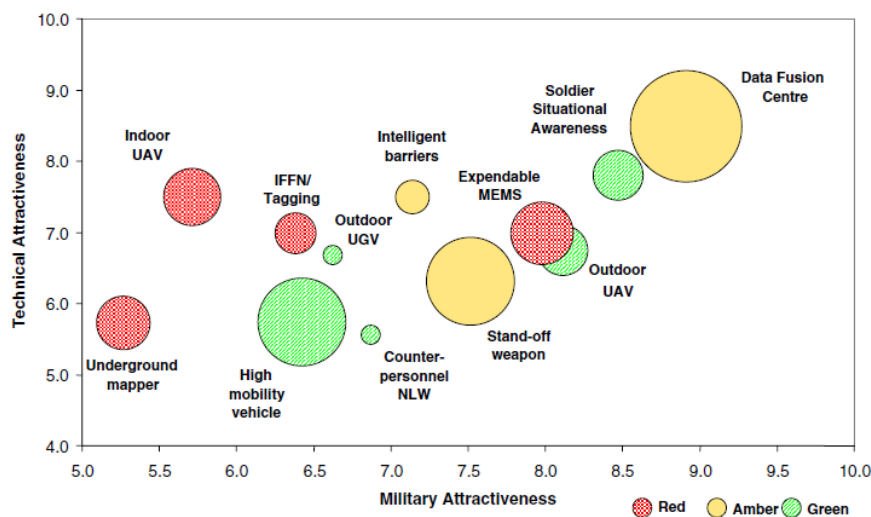


Figure 14: Urban Materiel Solutions - Portfolio Analysis (Figure 7)

A 2020 report on *Urban Combat Advanced Training Technology* (Urban Combat Advanced Training Technology (Technologie Avancee d'entrainement Au Combat Urbain), 2010) presented the NATO work to “foster greater compatibility and interoperability of MOUT training systems and thus enables sharing of national facilities among members of the Alliance”. The focus was on physical training centres (issues such as battlefield effects) and command-post exercise (CPXs) rather than on synthetic environments.

A 2013 report on *The Potential of Serious Games for Training of Urban Operations* (van der Hulst et al., 2013) examined what does and does not work when using first-person simulation systems (as in VBS) to train urban tactics and C2 – their unsuitability for skills training was emphasised. Whilst generally useful the main deficiencies were found to be the poor modelling of equipment and weapon effects, the lack of proper damage modelling and the poor capability of the AI for civilian and OPFOR behaviours.

A 2015 article in NATO’s *Three Swords* magazine described a “NATO Conceptual Study on Urbanisation that examines the impact of the urbanisation trend on NATO military operations between now and 2035” (Pendleton & Bodnar, 2015). This was part of the work of Allied Command Transformation (ACT) and the study homepage is at <https://www.act.nato.int/activities/nato-urbanisation-project/>. This looked at both conventional, COI and OOTW implications, the latter including natural disasters, mass migrations, and Megacity turmoil. The study recommended “to include and plan an Urban, Urban Littoral and Megacity LIVEX/CPX in the NATO 2017-2018 Military Training and Exercise Programme (MTEP) to further develop the recommendations and capabilities outlined in the NATO Urbanisation Conceptual Study which will help provide valuable lessons learned into Capability Development”. A 2017 article updated on the study (Pendleton & Bodnar, 2017). Amongst the key messages it listed from the study were:

- “There is no NATO Joint Urban Operations doctrine for operations within urban, urban littoral or megacity areas;

- NATO should acquire a specialist "Urban Training Area" or a network of training centres federated to achieve the same training effect with appropriate live, virtual and simulated training facilities and replicate the intellectual, physical, psychological and emotional challenges posed by urban operations;
- NATO must consider cities as units of analysis for intelligence purposes as opposed to the current practice of using states;
- Cities are dynamic systems and NATO needs to work on establishing a complete view of the urban environment through flow mapping, 3D modelling, geospatial support and possibly cooperation with nontraditional forces on the ground;
- Winning the "battle of the narrative" will be critical to mission success in operations within an urban environment;
- The military should aim to have as small a footprint as possible inside a city;
- Given the size of most cities, NATO can never expect to be able to build up overwhelming force in terms of mass due to the large number of civilians and other actors".

The article also reported on a 2016 seminar wargame set in the 2035 timeframe and in the fictional city of Archaria, which was supported by a custom-built 3D digital model, and supported by Dr David Kilcullen. One of the two scenarios explored a "high intensity and full spectrum operation". The findings of the wargame were not included in the article – although there is a USMC report on apparently the same game which described the 2035 vignettes being played twice (once with current capabilities, once with projected 2035 capabilities), and that the USMC players found that new capabilities needed to be considered in total rather than piecemeal and evolved their own urban operating concept – Urban I3 – focussing on integration, interoperability and interdependency (2016 NATO Urban Wargame First Impression, 2016). A final article in 2019 (Bodnar & Collins, 2019), reported on a Joint Urban Operations Wargame, loosely based on a matrix game approach held in 2018 to "(1) apply the key principles of the concept to assess their impact, (2) refine identified capability requirements, and (3) identify any operating and functional concepts that may be required in the future". It was an operational level game with a Red force that included "peer-like adversary, hybrid actors, and terrorist groups". The game was underpinned by two models: Archaria, a geodemographics model, and Marvel, a systems dynamics model of the city's resilience. The game found that the proposed NATO framework for urban operations required only "minor changes before concept delivery". The core elements of the concept, which are a bit vanilla, were that:

- Military forces must understand the urban environment in which they are operating, the nature of the conflict and the adversary;
- Military forces must be agile and adaptable, enabling them to operate effectively in the dynamic and complex operations environment;
- Military forces must interact effectively with the urban environment's human systems (governance, civil society and institutions) and its physical systems; and
- Urban operations must be viewed, planned, and conducted from a multi-dimensional perspective.

Follow-on work was expected to include a NATO Urban Doctrine, which was published (but not publicly) as the *Capstone Concept – Joint Military Operations in the Urban Environment* in 2018, the concept "gives strategic-level guidance, considers city size, climate, and development level, covers all domains and NATO's core tasks. It looks into the future, projecting out to 2035, while taking into account current challenges. It articulates implications and provides military advice on capability requirements. This concept does not provide tactical guidance" (NATO Urbanisation Project, n.d.). Hence it was at a higher level than the then just published 2017 ATP-99 Urban Tactics, but the latter document may not have reflected much of the new thinking.

A new strand of NATO urban activity appears to have started around 2020 with the emergence of Multi-Domain Operations (MDO) and the establishment of NATO project to "develop an operating concept for 'Multi-Domain Urban Operations'" (Multi-Domain Urban Ops, 2020). In 2021 ACT published a briefing on *Multi Domain Operations in Urban Environment Initial Concept 2.0* (Multi Domain Operations in Urban Environment Initial Concept 2.0, 2021). It's "big idea" was the

“continual synchronization of effects across 5 domains in UE (Urban Environment)”, but was being developed at a time when no NATO MDO Capstone Concept had yet been delivered. It noted that MDO would *“burst the relationship between the levels of operation”* as many MDO assets (e.g. space, cyber, information/influence) were held at the highest level. It was aimed at an operational level HQs, and would include a validation wargame in 2022, and delivery in 2023. The briefing does not really go beyond a general introduction to MDO and has little that is specifically urban. A 2022 article by the same author in Three Swords (NATO’s house magazine) added a bit more detail, describing the urban environment as a system of systems and composed of 4 main, interconnected, layers:

- Physical systems;
- Information systems;
- Human systems; and
- Resilience.

It also describes the need for a “Green Cell” as described in the 2018 Capstone Concept (although it is not clear if this is in peace, war or exercise) to obtain the necessary information on a city and to keep it up to date, using PMESII as a framework.

The validation wargame appears to have run in 2023 rather than 2022 (and so the MDO Initial Concept may have been delayed to 2024), and a report on the wargame identifies the 6 main principles of the evolving NATO MDO in UE concept (Hodicky, 2023):

- **“Interconnectivity** - unites are using interoperable command, control, communication, computers, information/intelligence, surveillance, target acquisition and reconnaissance (C4ISTAR) system enabling continual synchronization of effects across all domains.
- **Creativity** - internal decision-making is enhanced through scalable AI- assisted C4ISTAR and battlespace management tools supporting human machine teaming driven by the Commander’s direction for the level of machine input and automation to decision-making.
- **Unity** across all domains requires broad collaboration and negotiation at the operational level.
- **Agility** - increased C2 tempo, allowing C2 elements and units to better meet the challenges in a complex and dynamic operation in the UE, namely compression of the levels of warfare with tactical incidents having a strategic effect.
- **Understanding** - C4ISTAR elements delivers understanding of the adversary, the UE and local population supported by dynamic intelligence feeds, with rapid access to internal and external resources with reach back capacity to higher headquarters as required.
- **Interaction** - continuous interaction of MDO units at all levels of command with the UE, including the civilian population, urban infrastructure and urban information environment enables effective operation within the UE in comparison to those only with temporary effect.

For the wargame 66 MDO in UE capabilities were identified and refined to 16 Capability Cards for use in the wargame to be played in one or more of the physical, virtual or cognitive (PVC) dimensions. The wargame will be examined in more detail in a later chapter, but it appears to be a manual wargame making use of digital, constructive tools for modelling and visualisation of the common operation picture (COP), such as VR-Forces and an STM resilience model in a System of Simulation Systems (SSS) approach.

Conclusions

A more substantial conclusion will probably have to wait til I’ve had a chance to digest what I’ve written and to put it into a broader context. However, the elements which seemed to dominate as I’ve been putting this together are:

- There are a lot of themes in doctrine which were there in the earliest of documents, for instance mouseholing and good training, and (after a time) being an all-arms fight, and which have persisted to the present day (as has the on-going call for better urban training facilities) – the fundamentals at a squad level have not changed much.
- The urban facts (or myths) of the great equaliser and high attacker force ratios are ever present.
- Urban doctrine has constantly reflected the big military concerns of the day – whether its nuclear war or COIN or megacities or LSCO (or MDO?) – but unfortunately that usually involves over-writing the previous doctrine and losing good ideas.
- The increasing emphasis on seeing the city as a system of systems, having a full intelligence preparation of the operating environment, and understanding the people in the city and how they will react and be affected by military operations.
- Some of the recent US documents seem to have taken a step back in terms of urban (e.g. backing away from USECT which still seems a very simple and serviceable model). Recent UK doctrine in particular seems to “get it” – you’ll be fighting in urban whether you want to or not and it should probably be regarded as the norm.
- What happens when doctrine bumps up against reality, particularly in the context of Ukraine with the ubiquitous presence of drones (especially FP drones) and where urban battles over even small villages and towns seem to last for weeks or months?

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