

**UNITED STATES MARINE CORPS
THE BASIC SCHOOL
MARINE CORPS TRAINING COMMAND
CAMP BARRETT, VIRGINIA 22134-5019**

**URBAN OPERATIONS I
INTRODUCTION
B4R5359
STUDENT HANDOUT**

Urban Operations I - Introduction

Introduction

The purpose of this handout is to help you gain a basic understanding of urban operations. This class is approximately one hour long and is designed to provide for those considerations necessary for planning and executing offensive and/or defensive operations in an urbanized environment.

Importance

Throughout military history and the history of our Corps urban operations have played a vital role in winning wars. As provisional rifle platoon commanders, Marine Corps officers must maintain the skill sets necessary to plan for and execute urban operations.

In this lesson

In this lesson, you will be introduced to those characteristics that pertain specifically to urban operations. You will learn about the “3-Block War” and how this drives our planning and training for urban operations. In addition, you will learn about those METT-TC (mission, enemy, terrain and weather, troops and support available — time available, civil) considerations that are unique to the urban environment.

This lesson covers the following topics:

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Introduction to Urban Operations

Learning Objectives**TERMINAL LEARNING OBJECTIVE(S)**

Given a squad, an objective within an urban environment, and an order with commanders' intent, lead a squad in urban operations, to accomplish the commanders' intent. (TBS-MOUT-2001)

ENABLING LEARNING OBJECTIVE(S)

Without the aid of references, identify the levels of urban environments without omission. (TBS-MOUT-1001)

Without the aid of references, identify types of cover in an urban environment without omission. (TBS-MOUT-1002a)

Given a mission and civilian areas, structures, capabilities, organizations, personnel, and events; integrate civil considerations into tactical planning, to develop an estimate of the situation accomplish the mission. (TBS-LDR-1007c)

History and Introduction

Urban warfare is as old as warfare itself. Throughout history, military planners have viewed cities as centers of gravity. As such, in war, cities are something to be either protected or taken away, depending upon one's perspective. The principles of maneuver warfare that we have learned are still applicable in the urban environment with some additional considerations.

From our first expeditionary landing at New Providence in the Bahamas, through the streets of Mexico City, and in Haitian towns and villages during Lewis B. "Chesty" Puller's day, Marines have continually played a pivotal role in battles for urban areas. Marine combat experiences in urban environments during the last sixty years include:

- Seoul and Inchon – 1950.
- Beirut – 1958, 1982-1984.
- Santo Domingo – 1965.
- Hue City – 1968.
- Saigon – 1975.
- Grenada – 1983.
- Panama City – 1989.
- Mogadishu – 1993-1994.
- Haiti – 1994.
- Kosovo – 1999.
- Iraq – 2003-today.

As you can see from this list, over the last six decades, urban operations have been an extremely important aspect of Marine Corps operational readiness. Our ability to conduct operations in any urban environment is a key ingredient to our being considered America's "Force in Readiness". We must examine the lessons learned from our past and understand how those lessons help us plan for and execute urban operations.

Why Study URBAN OPERATIONS?

The world's population is becoming more urbanized. Projections show 85% of the world's population living in urban areas by the year 2025. Today 75% of politically significant urban areas are within 150 miles of a coastline, and 87% are within 300 miles of the coastline. Our ship to shore capability allows us to reach most urban areas.

Many of our current and future enemies cannot match our advantages in firepower, so they will use civilian populations for protection. Urban areas have the highest population concentration and therefore provide the best concealment to our adversaries.

When conceptualizing urban operations, commanders must understand two important terms: urban area and urban environment. The first is a subset of the second. An **urban area is a topographical complex where man-made construction or high population density is the dominant feature**. Focusing on urban areas means concentrating on the physical aspects of the area and their effects on weapons, equipment, line-of-sight, and tactics, techniques, and procedures. The **urban environment includes the physical aspects of the urban area as well as the complex and dynamic interaction and relationships between its key components—the terrain (natural and man-made), the society, and the supporting infrastructure**.

The "3-Block War"

The Three Block War

This is the landscape upon which the 21st Century battle will be fought. It will be an asymmetrical battlefield. Much like the Germanic tribes, our enemies will not allow us to fight the Son of Desert Storm, but will try to draw us into the stepchild of Chechnya. In one moment in time, our service members will be feeding and clothing displaced refugees—providing humanitarian assistance. In the next moment, they will be holding two warring tribes apart—conducting peacekeeping operations—and, finally, they will be fighting a highly lethal mid-intensity battle—all on the same day...all within three city blocks. It will be what we call the "three block war."

General Charles C. Krulak Commandant, US Marine Corps

Urban Operations and the Spectrum of Conflict. The phrase "3-Block War" was coined by Gen Charles C. Krulak to describe the various missions or situations that Marines may face when conducting operations in urban areas. The three blocks describe different environments, each with their own challenges that Marines will encounter, sometimes on the same day, in the same part of a city. The three blocks are described as follows:

Block One

- Humanitarian Operations.
- Host Nation Control.
- Stable Environment.
- Restrictive RulesOf Engagement (ROE).

Block Two

- Counter-Insurgency Operations.
- Limited Host Nation Control.
- Unstable Environment.
- Increased Force Protection.

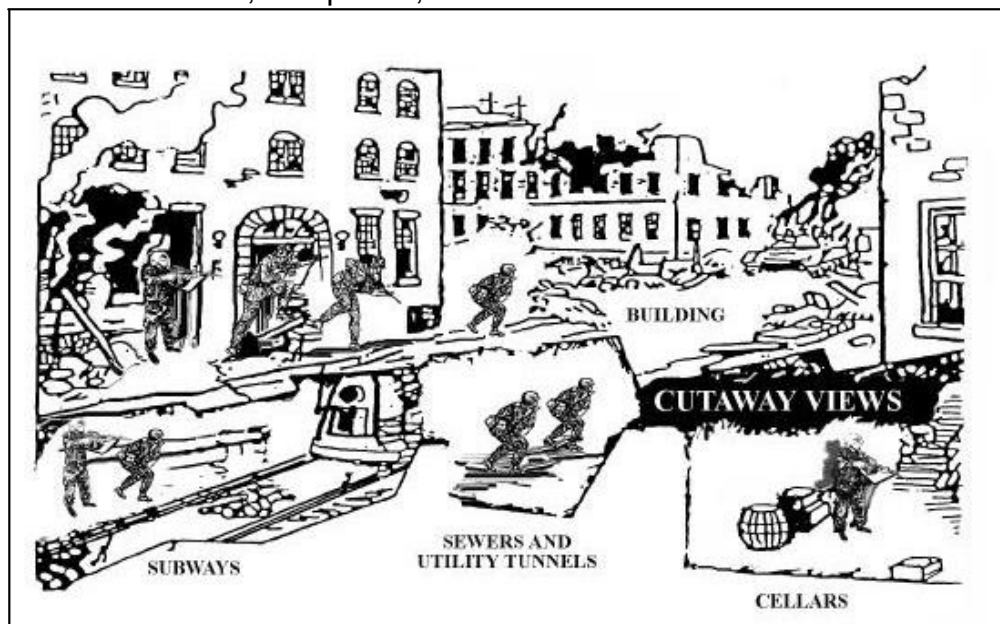
Block Three

- High intensity conflict.
- No Host Nation Control.
- Violent and chaotic environment

Understanding the “3 Blocks” and how they flow together helps Marine leaders to prepare to accomplish their mission in the varied environments of populated areas. The same patrol can encounter all three blocks in a small area during one patrol.

Multi-Dimensional Battlefield

Urban areas present an extraordinary blend of horizontal, vertical, interior, exterior, and subterranean forms superimposed on the natural relief, drainage, and vegetation. An urban area may appear dwarfed on a map by the surrounding countryside. In fact, the size and extent of the urban area of operations is many times that of a similarly sized portion of undeveloped natural terrain. A multi-storied building may take up the same surface area as a small field, but each story or floor contains approximately an equal area as the ground upon which it sits. In effect, a ten-story building can have eleven times more defensible area than “bare” ground—ten floors and the roof. It is the sheer volume and density created by this urban geometry that makes Urban Operations resource intensive in time, manpower, and materiel.



1. TYPES

Urban battle space includes—

The urban battlespace is divided into four basic levels: *building*, *street*, *subterranean*, and *air*. Operations can be conducted from above ground, on ground level, inside buildings, or below the ground. Most operations will include fighting on all levels simultaneously.

a. Building Level. Buildings provide cover and concealment; limit or increase fields of observation and fire; and canalize, restrict, or block movement of forces, especially mechanized forces. They provide optimum perches for snipers and anti-air weapons. Buildings also provide anti-tank weapons optimum positioning to allow engagement from above, exploiting an inherent weakness found in most armored vehicles.

b. Street Level. While streets provide the means for rapid advance or withdrawal, forces moving along streets are often canalized by buildings and have little space for off-road maneuver. Because they are more difficult to bypass, obstacles on streets in urbanized areas are usually more effective than those on roads in open terrain.

c. Subterranean Level. Subterranean systems are easily overlooked but can be important to the outcome of operations. These areas may be substantial and include subways, sewers, cellars, and utility systems (Figure 1-1 on page 1-4). The city of Los Angeles alone has more than 200 miles of storm sewers located under the city streets. Both attacker and defender can use subterranean avenues to maneuver to the rear or the flanks of an enemy. These avenues also facilitate the conduct of ambushes, counterattacks, and infiltrations.

d. Air Level. The air provides another avenue of approach in urbanized areas. Aviation assets can be used for high speed insertion or extraction of troops, supplies, and equipment. While aviation assets are not affected by obstacles on the streets, they are affected by light towers, signs, power lines, and other aerial obstructions. They are also vulnerable to the man-portable surface-to-air missile threat, crew served weapons, and small arms fire.

METT-TC Analysis Similarities and Differences

As always, our planning process follows the same Six Troop Leading Steps we use in any operation. Within these steps, the METT-TC analysis that we conduct in urban operations is almost identical to any other operation. Due to the presence of and influence by **people** in many urban operations, however, you must be able to properly assess both geographic and demographic considerations. Before diving into the cultural aspect of urban operations, we will cover some of the standard or typical geographic characteristics of urbanized areas.

Commanders must be able to identify building types, construction materials, and building design and must understand the effectiveness and limitations of weapons against these factors. They must also understand that urban combat will require them to

visualize a three-dimensional battle space. Commanders and leaders must be aware of how their urban battle space is changing as friendly and enemy forces and civilians move and as weather and environmental conditions change. They can react to changes within their battle space with the timely movement of assault, support, and security elements in the offense and repositioning of squads in the defense through the use of effective tasking statements.

Other factors that impact battle space include—

- CASEVAC and resupply procedures
- Procedures for handling EPW and noncombatants
- Rules of engagement (ROE)
- Battlefield obscuration
- Communications
- Movement of vehicles, that is, how the battlespace will affect movement and target engagement.

Urban Zones and Street Patterns

The urban area is analyzed using the zones and street patterns. Urban areas will contain varying degrees of physical infrastructure. This infrastructure will at a minimum include a transportation network, utilities, government buildings, hospitals, schools, food processing and distribution centers, and communications facilities. The infrastructure may be relatively simple or it may be highly complex and sophisticated. For example, transportation infrastructure in one city may be a simple network of streets; in another city it may consist of sophisticated port facilities, rail networks, airports, large highways, subways, and other modes of public transportation. In the latter case, such a city would be the transportation hub for the region in which it is located.

In addition to the physical infrastructure of power plants, transportation networks, and the like, cities also have a service infrastructure: police, fire, and other government services; food and water availability and distribution; medical services; fuel and electricity; the news media and information flow; and others. This sort of infrastructure may be quite sophisticated and an integral part of the city's life, it may be virtually nonexistent, or it may exist in a state of ineffectiveness.

Urban Zones

1. City Core. The city core is the heart of the urban area—the downtown or central business district. It is relatively small and compact, but contains a larger percentage of the urban area's shops, offices, and public institutions. It normally contains the highest density of multistory buildings and subterranean areas. In most cities, the core has undergone more recent development than the core periphery. As a result, the two regions are often quite different. Typical city cores of today are made up of buildings that vary greatly in height.



2. Commercial Ribbon. Commercial ribbons are composed of rows of stores, shops, and restaurants that are built along both sides of major streets through built-up areas. Typically, such streets are 25 meters wide or more. The buildings in the outer areas are uniformly two to three stories tall—about one story taller than the dwellings on the streets behind them.



Urban Construction

1. Dense Random Construction. This construction is a typical old inner city pattern with narrow winding streets radiating from a central area in an irregular manner. Buildings are closely located and frequently close to the edge of a roadway.



2. Close Orderly Block Construction. Wider streets generally form rectangular patterns in this area. Buildings frequently form a continuous front along the blocks. Inner-block courtyards are common.



3. Dispersed Residential Area. This type area is normally contiguous to close-orderly block areas in Europe. The pattern consists of row houses or single-family dwellings with yards, gardens, trees, and fences. Street patterns are normally rectangular or curving.



4. High-Rise Area. Typical of modern construction in larger cities and towns, this area consists of multistoried apartments, separated open areas, and single-story buildings. Wide streets are laid out in rectangular patterns. These areas are often contiguous to industrial or transportation areas or interspersed with close-orderly block areas.



5. Industrial-Transportation Area. Industrial-transportation areas are generally located on or along major rail and highway routes in urban complexes. Older complexes may be located within dense, random construction or close-orderly block areas. New construction normally consists of low, flat-roofed factory and warehouse buildings. High-rise areas providing worker housing is normally located adjacent to these areas throughout the East Asia. Identification of transportation facilities within these areas is critical because these facilities, especially rail facilities, pose significant obstacles to military movement.



6. Permanent or Fixed Fortifications. These include any of several different types and may be considered isolated forts, such as the Hue Citadel and the German fortifications that surrounded Metz, or as part of a fortified line (Siegfried and Maginot Lines). While most of these fortifications are found in Western Europe, many can be found in the Balkans, Middle East, Asia, Africa, and South America. Those in the United

States are mostly of the coast defense type. Permanent fortifications can be made of earth, wood, rock, brick, concrete, steel-reinforced concrete, or any combination of the above. Some of the latest variants are built underground and employ heavy tank or warship armor, major caliber and other weapons, internal communications, service facilities, and NBC overpressure systems.



7. Shantytowns. Shantytowns do not necessarily follow any of the above patterns and may be found in many different zones within urban areas. Many underdeveloped countries are composed of small towns and villages and very few large cities. Most of the structures in the small towns and villages may be constructed from materials ranging from cardboard to concrete block. Some countries in arid regions depend on adobe for construction. Even the larger cities can have shantytowns at the edge that consist of cardboard or tin shacks.

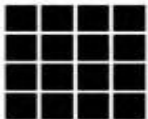







a. Weapons Effects. These less structurally sound buildings have no common floor pattern and are more likely to have only one room. These types of substandard structures present a problem of weapons over-penetration. Weapons fired in one structure may penetrate the walls of one or more buildings. This penetration becomes a hazard for friendly forces as well as noncombatants. In order for buildings not to be structurally damaged or completely destroyed, reduce the explosive charges or do not use them. Fires are also more likely to develop and spread in shantytowns.

b. Mobility Considerations. Depending upon the type of operation, the temporary nature of the structures can mean that mobility can be either more or less restricted than other sections of an urban area. A unit with armored vehicles may easily knock down and traverse structures without affecting mobility at all. However, their destruction may cause unacceptable civilian casualties, in which case mobility becomes more

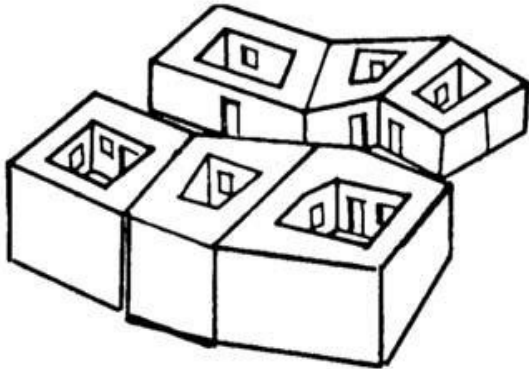
restrictive as the narrow paths often do not accommodate vehicles. Regardless, commanders must carefully consider the effects of their operations in this area, to include vehicles and weapons, as the weak structures afford little protection increasing the risk of fratricide, civilian casualties, and large, rapidly spreading fires.



8. Street Patterns. Knowledge of street patterns and widths gives commanders and leaders a good idea of whether or not mounted mobility corridors in different zones can permit wheeled or tracked vehicles and facilitate command and control. For example, a rectangular, radial, radial ring, or combined pattern facilitates movement and control better than irregular patterns (see next page).

Shape	Street Pattern	Effect
	Rectangular or Chessboard	Streets are grid-like, with parallel streets intersected by perpendicular streets.
	Rayed	Streets that fan out at various angles from a given focal point and through less than 360 degrees.
	Radial	Primary thoroughfares radiate out from a central point. These streets may be extended outward 360 degrees around the central point or within an arc from a point along a natural barrier, such as a coastline.
	Radial-Ring	Loops or rings are surrounded by successively larger ones. Usually found in conjunction with larger radial patterns. Radial rings incorporate the elements of both radial and ring/concentric designs.
	Contour Forming	Pronounced terrain relief influences construction of roadways along lines of elevation. Primary streets run parallel to contour lines, with intersecting roads connecting them.
	Irregular Pattern	Irregular street patterns have been specifically engineered without geometric patterns for aesthetic or functional reasons. An American subdivision with curving streets and cul-de-sacs is an example.
	Combined Pattern	Any combination of the above and is best demonstrated by the development of high rise and business districts in Medieval or pre-Medieval cities.
	Linear Pattern	A primary thoroughfare radiates down the center with buildings on either side. American strip malls and main shopping districts are patterned this way for ease and convenience.

Enclosed courtyard



CHARACTERISTICS

Windowless outer walls, inner courtyards.

Varying size, dimensions.

No setbacks.

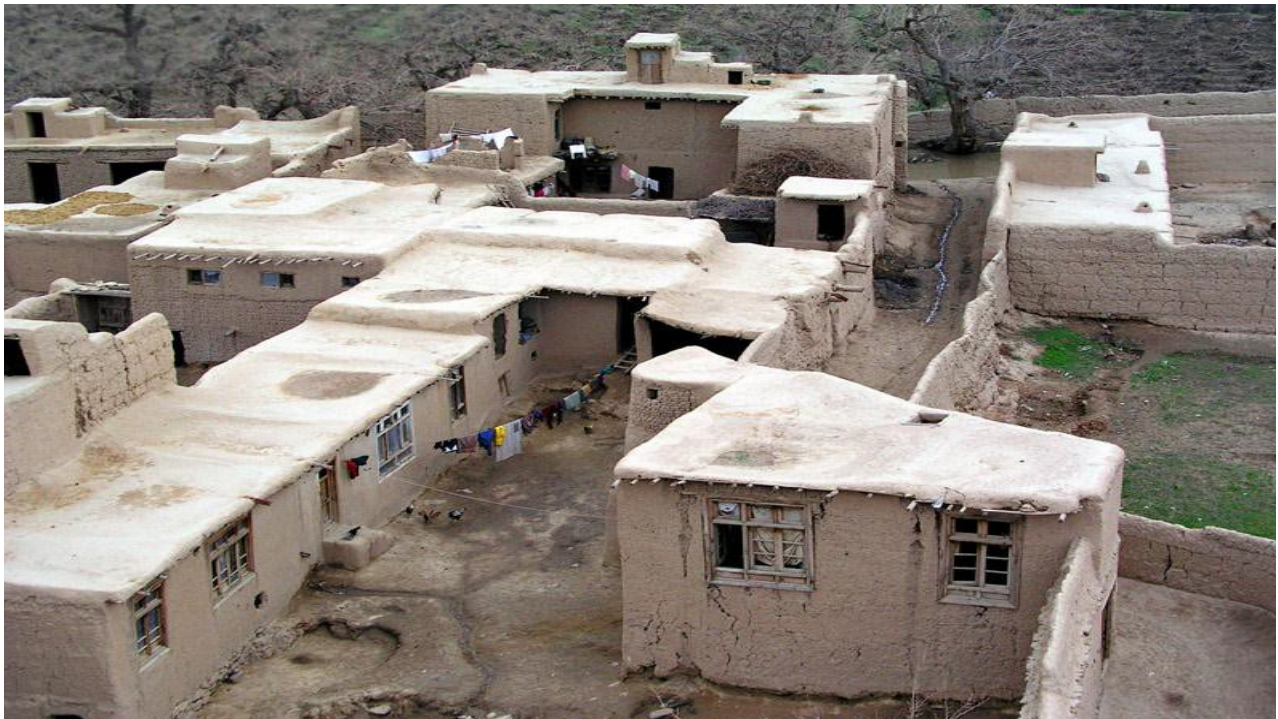
One to two stories tall.

Flat roofs.

Floor plan: All rooms open onto courtyard.

Location: On narrow, curving streets with short horizontal lines of sight.

Area found: Middle East, north Africa, and Mediterranean.



The most common buildings in Afghanistan are mud brick construction homes with an exterior courtyard consisting of the same material. Typically the walls of the home are 24" thick and the walls of the courtyard are 12" thick.

EFFECTIVENESS OF WEAPONS AND DEMOLITIONS

The characteristics and nature of combat in urban areas affect the employment of weapons and the results they can achieve. Leaders at all levels must consider the following factors in various combinations.

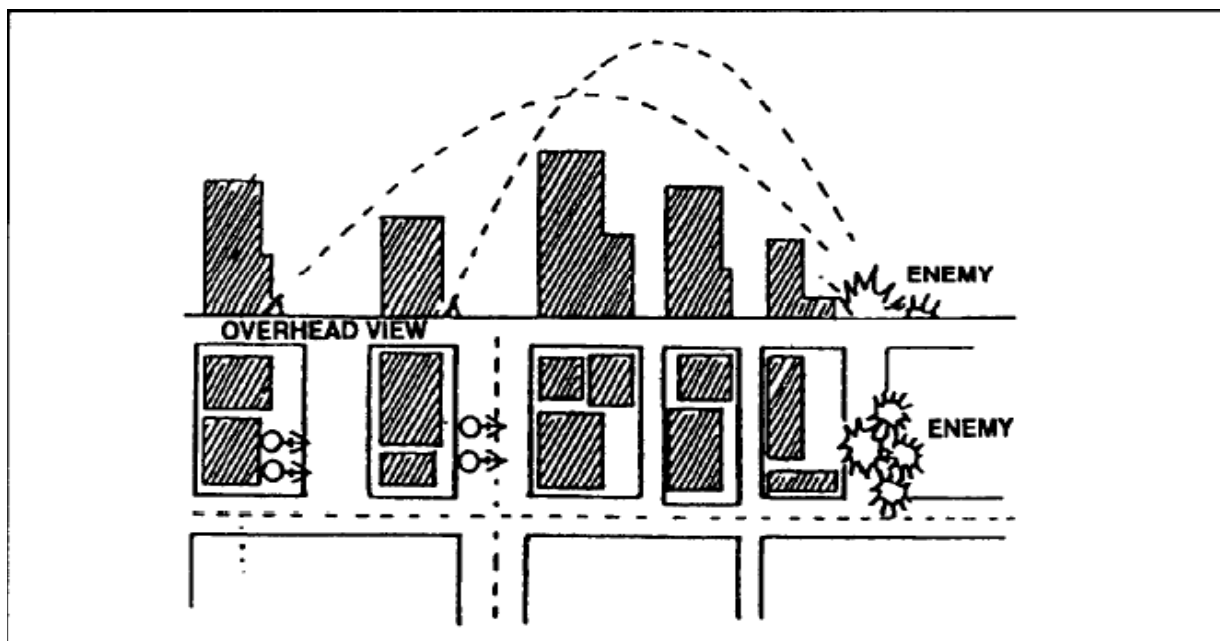
1. Urban Factor Considerations

a. Surfaces. Hard, smooth, flat surfaces are characteristic of urban targets. Rarely do rounds impact perpendicular to these flat surfaces; rather, they impact at some angle of obliquity, which reduces the effect of a round and increases the threat of ricochets.

b. Engagement Ranges. Engagement ranges are close. Studies and historical analyses have shown that only 5 percent of all targets are more than 100 meters away. About 90 percent of all targets are located 50 meters or less from the identifying Marine. Few personnel targets will be visible beyond 50 meters and engagements usually occur at 35 meters or less. Minimum arming ranges and troop safety from backblast or fragmentation effects must be considered.

c. Engagement Times. Engagement times are short. Enemy personnel present only fleeting targets. Enemy-held buildings or structures are normally covered by fire and often cannot be engaged with deliberate, well-aimed shots.

d. Depression and Elevation. Depression and elevation limits for some weapons create dead space. Tall buildings form deep canyons that are often safe from indirect fires. Some weapon systems, (i.e: MK-19, M203, M2) can fire rounds to ricochet behind cover and inflict casualties. Target engagement from oblique angles, both horizontal and vertical, demands superior marksmanship skills.



e. Reduced Visibility. Smoke from burning buildings, dust from explosions, shadows from tall buildings, and the lack of light penetrating inner rooms all combine to reduce visibility and to increase a sense of isolation. Added to this is the masking of fires caused by rubble and man-made structures. Targets, even those at close range, tend to be indistinct.



f. Risks from Friendly Fire. Urban fighting often becomes confused melees with several small units attacking on converging axes. The risks from friendly fires, ricochets, and fratricide must be considered during planning. Control measures must be continually adjusted to lower the risks. Marines and leaders must maintain a sense of situational awareness and clearly mark their progress IAW unit SOP to avoid fratricide.

g. Close Combat. Both the shooter and target may be inside or outside buildings, and they both may be inside the same or separate buildings. The enclosed nature of combat in urban areas means the weapon's effects, such as muzzle blast and backblast, must be considered as well as the round's effects on the target.



h. Attacking Man-made Structures. Usually man-made structures must be attacked before enemy personnel inside are attacked. Weapons and demolitions can be chosen for employment based on their effects against masonry and concrete rather than against enemy personnel.

i. Building Types. Buildings in Afghanistan are mud brick construction homes with an exterior courtyard consisting of the same material. Typically the walls of the home are 24" thick and the walls of the courtyard are 12" thick.



2. Types of Breach Holes. The following definitions were determined based on the analyses of various studies relating to the size of "man-sized" holes and experimentation analyses from the MOUT - Advanced Concepts Technology Demonstration (ACTD).

a. Loop-hole. A loop-hole is a firing aperture (a minimum of 8 inches in diameter) made in a structure.

b. Mouse-hole. A mouse-hole is an opening that is made to the interior or exterior of a structure (walls, floors, ceilings, roofs) to facilitate inter- and intra-building communications and movement. A mouse-hole is usually a minimum of 24 inches high by 30 inches wide in size.

c. Breach Hole. A breach hole is an opening that is made in a structure using mechanical, ballistic, explosive, or thermal means to facilitate the entry of assault elements. A breach hole is normally 50 inches high by 30 inches wide in size. Breaches made through existing apertures, for example doors and windows, normally do not require additional size enhancement.

3. Effects of Common Weapons Systems

a. Effects of Small Arms

(1) **5.56-mm Caliber Penetration.** A 5.56-mm round is generally ineffective in penetrating urban obstacles when compared to larger caliber rounds. Any penetration that does occur depends chiefly on the range to the target and the type of material the shooter is firing against. Single 5.56-mm rounds are particularly ineffective against structural materials (as opposed to partitions) when fired at close range—the closer the range, the less the penetration.

(2) **5.56-mm Maximum Penetration.** For the 5.56-mm round, maximum penetration occurs at 200 meters. At ranges less than 25 meters, penetration is greatly reduced. At 10 meters, penetration by the M16 round is extremely poor due to the tremendous stress placed on this high-speed round, which causes it to yaw upon striking a target. Stress causes the projectile to break up, and the resulting fragments are often too small to penetrate.

(3) **Reduced Penetration.** Even with reduced penetration at short ranges, interior walls made of thin wood paneling, sheet rock, or plaster offer no protection against 5.56-mm ball ammunition rounds. Common office furniture, such as desks and chairs, cannot stop these rounds, but a layer of books 18 to 24 inches thick can.

(4) **Wood and Cinder Blocks.** Wooden frame buildings and single cinder block walls offer little protection from 5.56-mm rounds. When clearing such structures, Marines must ensure friendly casualties do not result from rounds passing through walls, floors, or ceilings.

(5) **Armor-Piercing Rounds.** Armor-piercing rounds are slightly more effective than ball ammunition in penetrating urban targets at all ranges. They are more likely to ricochet than ball ammunition when the target presents a high degree of obliquity.

(6) **Protection.** The following common barriers in urban areas stop a 5.56-mm round fired at less than 50 meters:

- One thickness of well-packed sandbags
- A 2-inch concrete wall (nonreinforced)
- A 55-gallon drum filled with water or sand
- A small ammunition can filled with sand
- A cinder block filled with sand (block will probably shatter)
- A brick veneer
- A car body (5.56-mm rounds penetrate but may not always exit).

Round (@ 50 meters)	1 Sand Bag	Cinder Block	2 in. Concrete	Car Body (Both Sides)	55 Gallon Drum (Sand Filled)
5.56-mm.	Red	Red	Red	Red	Red
7.62-mm.	Green	Green	Red	Green	Red
.50 cal.	Green	Green	Green	Green	Red

(7) **Wall Penetration.** Although most structural materials repel single 5.56-mm rounds, continued and concentrated firing can breach some typical urban structures

TYPE	PENETRATION	ROUNDS (REQUIRED)
8-inch reinforced concrete	Initial	35
	Loophole	250
14-inch triple brick	Initial	90
	Loophole	160
12-inch cinder block with single-brick veneer	Loophole	60
	Breach hole	250
9-inch double brick	Initial	70
	Loophole	120
16-inch tree trunk or log wall	Initial*	1 to 3
12-inch cinder block (filled with sand)	Loophole	35
24-inch double sandbag wall	Initial*	220
3/8-inch mild steel door	Initial*	1
*Penetration only, no loophole.		

Structure penetration capabilities of the 5.56-mm round against typical urban targets (range 25 to 100 meters).

b. Effects of Medium and Heavy Machine Guns (7.62-mm and .50 Caliber)

The 7.62-mm and .50 Caliber round have generally good penetration capability in the urban environment, and may be used to suppress through walls (see tables above). In the urban environment, the Browning .50 caliber machine gun and the 7.62-mm M240B machine gun chiefly provide high-volume, long-range, automatic fires for the suppression or destruction of targets. They provide final protective fire along fixed lines and can be used to penetrate light structures—the .50 caliber machine gun is most effective in this role. Tracers from both machine guns are likely to start fires.

M240B machine guns are less effective against masonry targets than .50 caliber machine guns because of their reduced penetration power. The gun's availability and its lighter weight make it well suited to augment heavy machine gun fire. They can be used in areas where the .50 caliber machine guns cannot be positioned, or they can be used as a substitute when heavy machine guns are not available. The M240B machine gun can be employed on its tripod to deliver accurate fire along fixed lines and then can quickly be converted to bipod fire to cover alternate fields of fire.

(1) 7.62-mm/.50 Caliber Penetration. As with the 5.56-mm round, the ability of the 7.62-mm and .50 caliber rounds to penetrate chiefly depends on the range to the target and the target construction. The 7.62-mm round is more effective at close ranges than the 5.56-mm round; the .50 caliber round has the best penetration of all U.S. direct-fire rounds (excepting some armor-piercing and HE projectiles).

Structure penetrating capabilities of 7.62-mm round (NATO ball) against typical urban targets (range 25 meters)

TYPE	THICKNESS (inches)	HOLE DIAMETER (inches)	ROUNDS REQUIRED
Reinforced concrete	8	7	100
Triple brick wall	14	7	170
Concrete block with single brick veneer	12	6 and 24	30 and 200
Cinder block (filled)	12	*	18
Double brick wall	9	*	45
Double sandbag wall	24	*	110
Log wall	16	*	1
Mild steel door	3/8	*	1

* Penetration only, no loophole.

Structure penetrating capabilities of caliber .50 ball against typical urban targets (range 35 meters)

TYPE	THICKNESS (inches)	HOLE DIAMETER (inches)	ROUNDS REQUIRED
Reinforced concrete	10	12	50
		24	100
		18	140
Triple brick wall	12	8	15
		26	50
Concrete block with single brick veneer	12	10	25
		33	45
Armor plate	1	*	1
Double sandbag wall	24	*	5
Log wall	16	*	1

* Penetration only, no loophole.

M240B

Range: 200m

Direction: frontal

Number of rounds fired: 300 API, 300 linked ball

Effects: The 300 rounds API created two holes each 11/2' tall by 1 foot wide. The standard ammo had less of an effect on the wall. Again two holes were created each spanning 10" by 7". The firer attempted to fire a U-type pattern.

Comments: Although the M240B may not be suited for breaching a wall alone, it serves as an excellent weapon system to augment heavier weapons. The accuracy of the 240B, rate of fire, and ability of the firer to quickly adjust rounds on target, makes it an excellent weapon system to widen holes that already exist. Ball ammo can have the same effects as API but would take more ammo and more time.

7.62 Ball



7.62 API



Range: 200m

Direction: frontal

Number of rounds fired: 300 API

Effects: The 50 cal API round proved to be extremely effective. After 100 rounds, it created a hole 2' by 3'. After 200 rounds the hole increased to 3' by 6', and by 300 rounds API the hole created spanned 3 ½ feet by 9 feet, big enough for a Ranger to fluidly enter a compound.

Comments: The accuracy, rate of fire, and dependability of the M2 make it a very effective weapon to breach an adobe wall. In three minutes at a sustained rate of fire, the hole created was large enough for entry. If augmented with 7.62, the time could be reduced significantly. *Due to lack of ammo standard 50 caliber ball rounds were not fired.* **Also to note, 6 rounds of 50-cal sniper fire from 100 meters created an 8" by 8" hole.**

M2 (50 cal API)



c. Effects of Grenade Launchers, 40-mm (M203 AND MK-19)

Both the M203 dual-purpose weapon and the MK 19 grenade machine gun fire 40-mm high-explosive (HE) and high-explosive dual-purpose (HEDP) ammunition. Ammunition for these weapons is not interchangeable, but the grenade and fuze assembly hitting the target is identical. Both weapons provide point and area destructive fires as well as suppression. The MK-19 has a much higher rate of fire and a longer range; the M203 is much lighter and more maneuverable. Grenade rounds may have an incendiary effect against flammable structures.

(1) Employment. The main consideration affecting the employment of 40-mm grenades within urban areas is the typically short engagement range. The 40-mm grenade has a minimum arming range of 14 to 28 meters. If the round strikes an object before it is armed, it will not detonate. This means the minimum safe firing range for combat is 31 meters. The 40-mm grenades can be used to suppress the enemy in a building, or inflict casualties by firing through apertures or windows. The MK 19 can concentrate a high rate of fire can against light buildings to create extensive damage.

(2) 40-mm HEDP Penetration. The 40-mm HEDP grenade has a small shaped charge that penetrates better than the HE round. It also has a thin wire wrapping that bursts into a dense fragmentation pattern, creating casualties out to 5 meters. Because they explode on contact, 40-mm rounds achieve the same penetration regardless of range.

Penetration capabilities of the 40mm HEDP Round	
TARGET	PENETRATION (inches)
Sandbags	20 (double layer)
Sand-filled cinder block	16
Pine logs	12
Armor plate	2

(3) Wall Penetration. The M203 cannot reasonably deliver the rounds needed to breach a typical exterior wall; the MK 19 can concentrate its fire and achieve wall penetration. Using a tripod and a locked down traversing and elevating (T&E) mechanism is best for this role. Brick, cinder block, and concrete can be breached using the MK 19 individual HEDP rounds, which can penetrate around 6 to 8 inches of material. The only type of structure that has proven resistant to concentrated 40-mm fire is dense stone such as that used in some European building construction. No precise data exist as to the number of rounds required to produce loopholes or breach holes with the MK 19; however, the rounds' explosive effects are dramatic and should exceed the performance of the .50 caliber machine gun.

M203 (40mm HEDP)

Range: 125-150m

Direction: frontal

Number of rounds fired: 40

Effects: The M203 HEDP round did not penetrate or violate the structure of the wall. It created an impact area of 7" wide and 2" deep.

Comments: The value of the M203 round as a breaching tool is negligible; however, it remains the only organic weapon at the platoon level able to engage targets behind the wall, making it an invaluable weapon system to employ



Range: 200m

Direction: frontal

Number of rounds fired: 100

Effects: The MK 19 created a 3' x 5' hole after 50 rounds fired. This span increased to 6' by 10' after 100 rounds, large enough for a fire team to move through in a tight wedge.

Comments: The destruction caused by the MK 19 far out did any other weapon system. It is a very effective weapon to breach a wall. However, disadvantages include the varied accuracy, and slower rate of fire. Unlike the M2 gunner, the MK 19 gunner had to reacquire the target between bursts.

MK 19



d. Effects of Light and Medium Recoilless Weapons. Light and medium recoilless weapons are used to attack enemy personnel, field fortifications, and light armored vehicles. They have limited capability against main battle tanks, especially those equipped with reactive armor (except when attacking from the top, flanks, or rear). The light category of recoilless weapons includes the AT4 M136 series; and the shoulder-launched, multipurpose, assault weapon (SMAW). The medium recoilless weapon in the U.S. arsenal is the Javelin.

(1) Employment. Other than defeating light armored vehicles, the most common task for light recoilless weapons is to neutralize fortified firing positions. Due to the design of the warhead and the narrow blast effect, these weapons are not as effective in this role as heavier weapons such as a tank main gun round or 155-mm artillery in a direct fire mode. They are lightweight, allowing Marines to carry several rounds each, and they must be fired from the tops of buildings or from areas with proper ventilation to account for the backblast. Recoilless backblast effects include overpressure and fire.

(a) Light and medium recoilless weapons, with the exception of the SMAW, employ shaped-charge warheads. As a result, the hole they punch into walls is often too small to use as a loophole. The fragmentation and spall these weapons produce are limited. Normally, shaped-charge warheads do not neutralize enemy soldiers behind walls unless they are located directly in line with the point of impact.

(b) Sandbagged emplacements present a different problem. These positions may be encountered in urban areas that are adjacent to or contain natural terrain. Because sandbags absorb much of the energy from a shaped-charge, the rounds should be aimed at the center of the firing aperture. Even if the round misses the aperture, the bunker wall area near it is usually easier to penetrate.

(2) Rocket Penetration. The most use for rockets is in neutralizing fortified fighting positions, personnel, and weapons either within structures or behind barriers. Recoilless weapons can be used in this role, but none of them are as effective as heavy direct-fire weapons or standard demolitions. Each recoilless weapon has different penetrating ability against various targets, and it should be noted that penetration does not always mean the destruction of the integrity of a position. Usually, only those enemy soldiers directly in the path of the spall from a High Explosive Anti-Tank (HEAT) round become casualties. Other soldiers inside a fortification could be deafened, dazed, or shocked but eventually may return to action.

(3) Wall Breaching. Wall breaching is a common combat task in urban areas for light recoilless weapons, particularly the SMAW. Breaching operations improve mobility by providing access to building interiors without using existing doors or windows. Breaching techniques can also be used to create loopholes for weapons positions or to allow hand grenades to be thrown into defended structures. Breach holes for troop mobility should be about 50 inches high by 30 inches wide. Loopholes should be about 8 inches in diameter. None of the light recoilless weapons organic to Infantry battalions (with the possible exception of the SMAW) provide a one-shot wall-breaching capability. To effectively breach walls, plan on using two to four shots.

(a) Heavy stone is the most difficult material to penetrate. Most light recoilless weapons (particularly the AT-4) only achieve surface cratering.

(b) Layered brick walls are also difficult to breach with light recoilless weapons, and generally require multiple firings--the AT-4 or LAW rocket may require 3 to 5 rounds in order to penetrate brick walls. The SMAW, however, produces a hole in brick walls that is often large enough to be a breach hole.

(c) Wooden structural walls offer little resistance to light recoilless weapons. Even heavy timbered walls are penetrated and splintered. A single round from an AT-4 or SMAW produces a large breach hole and significant spall.

(d) None of the light recoilless weapons are as effective against structural walls as either demolitions or heavier weapons such as a tank main gun or direct-fire artillery. Of all the light recoilless weapons, the SMAW is the most effective

M72A2 LAW

Range: 100-125m

Direction: Frontal

Effects: Two rounds fired (one at a time)—both impacted at approximately the same point at the mid-section of the wall and left small holes in the wall but did not violate the integrity of the wall.

Comments: The M72A2 LAW had very similar effects to the AT-4. Due to limited effects the LAW is not a good weapon system to execute a breach on an adobe wall, but should be very effective against vehicular targets within 100-200 meters (Amazingly, what it was designed for).



AT-4

Range: 150m

Direction: frontal, oblique (apx 45 degree)

Number of rounds fired: 2

Effects: The frontal shot fired from the AT-4 penetrated the wall leaving a quarter size hole. The structure surrounding the wall was still very much intact. Damage on the far side of the wall is unknown. The effects of the round fired from an oblique angle were even more disappointing. We could not detect any penetration through the wall and the surrounding structure remained intact.

Comments: An AT-4 should not be used as a hasty breach on an adobe wall.



e. Effects of Anti-Tank Guided Missiles. Antitank guided missiles (ATGMs) are designed to defeat main battle tanks and other armored combat vehicles and therefore have only a moderate capability against bunkers, buildings, and other fortified targets commonly in urban areas. This category of weapons includes the TOW and Javelin.

(1) Employment. TOWs provide over watch antitank fires during the attack of an urban area and extended range capability for engaging armor during the defense. Within urban areas, they are best employed along major thoroughfares and from the upper stories of buildings to attain long-range fields of fire. Their minimum firing range of 65 meters could limit firing opportunities in the confines of densely urban areas. The optics of the TOW saber system can successfully observe targets up to 5km away.

(2) Missile Penetration. Anti Tank Guide Missiles (ATGMs) can penetrate and destroy heavily armored tanks. They have large warheads employing the shaped-charge principle. Because of their size, these warheads achieve significant penetration against typical urban targets by creating a small aperture, usually the size of a loophole. Penetration does not mean concurrent destruction of the structural integrity of a position. The shaped-charge warhead produces relatively little spall. Enemy personnel not standing directly behind or near the point of impact of an ATGM may escape injury. TOW missiles can defeat triple sandbag walls, double layers of earth filled 55-gallon drums, and 18-inch log walls.

(a) TOW 2B. The TOW 2B uses a different method of defeating enemy armor. It flies over the target and fires an explosively formed penetrator down onto the top of an armor vehicle, where the armor is thinner. Because of this design feature, the TOW 2B missile cannot be used to attack nonmetallic structural targets. When using the TOW 2B missile against enemy armor, gunners must avoid firing directly over other friendly vehicles, disabled vehicles, or large metal objects such as water or oil tanks.

f. Effects of Mortars. The urban environment greatly restricts low-angle indirect fires because of the vertical nature of urban terrain. While all indirect fire weapons are subject to masking effects of buildings, mortars are less affected than field artillery weapons due to the mortar's higher trajectory. For low-angle artillery fire, dead space (or the exclusion zone behind a building) is about five times the height of the building behind which the target sits; for mortar fire, dead space is only about one-half the height of the building. Because of these advantages, mortars are even more important to the infantry during urban combat.

(1) Employment. Not only can mortars fire into the deep defilade created by tall buildings--the so-called "urban canyon"--but they can also fire out of it. Mortars emplaced behind buildings are difficult for the enemy to locate accurately and are therefore resistant to counterfire. Because they are relatively lightweight, mortars (even heavy mortars) can be hand carried to firing positions that are inaccessible to vehicles.

(a) Mortars can be fired through the roof of a ruined building if the ground-level flooring is solid enough to withstand the recoil. If there is only concrete in the mortar platoon's area, mortars can be fired using sandbags as a buffer under the baseplate and curbs as anchors and braces. (This is recommended only when time is not available to prepare better firing area.) Aiming posts can be placed in dirt-filled cans.

(b) The 60-mm and 81-mm mortars have a very limited effect on structural targets. Even with delay fuzes they seldom penetrate even the roofs of buildings. However, their wide area coverage and multi-option fuses make them useful against an enemy force utilizing open roof-tops, streets, or advancing in the open.

(2) Effects of Mortar Fire. The multi-option fuze on newer US mortar rounds makes them effective weapons on urban terrain. Proximity bursts in particular increase the lethal area covered by fragments. Tall buildings, however, can cause proximity fuzed mortar rounds to detonate prematurely if the round passes too closely over a roof during its flight.

(a) 60-mm Mortar. The 60-mm mortar round cannot penetrate most rooftops, even with a delay setting. Small explosive rounds are effective, however, in suppressing snipers on rooftops and preventing roofs from being used by enemy observers. The 60-mm WP round is not normally a good screening round due to its small area of coverage. In urban combat, however, the tendency of smoke to linger and the small areas to be screened make it more effective. During the battle for Hue in South Vietnam, 60-mm WP rounds were used to create small, short-term, smoke screens to conceal movement across open areas such as parks, plazas, and bridges. Fragments from 60-mm HE rounds landing as close as 10 feet away cannot penetrate a single sandbag layer or a single-layer brick wall, allowing Marines to safely call in mortar fire much closer to their own position (provided the Marines have cover). The effect of a 60-mm mortar HE round that achieves a direct hit on a bunker or fighting position is equivalent to 1 or 2 pounds of TNT. Normally, the blast will not collapse a properly constructed bunker but can cause structural damage. The 60-mm mortar will not normally crater a hard-surfaced road.

(b) 81-mm Mortar. The 81-mm mortar has nearly identical effects against urban targets as the 60-mm mortar. It has a slightly greater lethal area and its smoke rounds (WP and RP) are more effective. A direct hit is equivalent to about 2 pounds of TNT. The 81-mm round cannot significantly crater a hard-surfaced road. With a delay setting, the 81-mm round may penetrate the roofs of light buildings.

(b) 120-mm Mortar. The 120-mm mortar is large enough to have a major effect on common urban targets. With a delay setting, it may penetrate into a building, causing extensive damage because of its explosive power. A minimum of 18 inches of packed earth or sand is needed to stop the fragments from a 120-mm HE round impacting 10 feet away. The effect of a direct hit from a 120-mm round is equivalent to almost 10 pounds of TNT, which can crush fortifications built with commonly available materials. The 120-mm mortar round can also create a large but shallow crater in a road surface, but the crater will not be deep or steep-sided enough to block vehicular movement. However, craters could be deep enough to damage or destroy storm drain systems, water and gas pipes, and electrical or phone cables.

OCOKA-W and ASCOPE

Geography and Demography. By conducting a thorough METT-TC analysis, we evaluate Terrain and Weather using the OCOKA-W acronym (Observation and Fields of

fire, Cover and Concealment, Obstacles, Key Terrain, Avenues of Approach -- Weather). Because urban areas usually contain high concentration of people, however, we must also consider the details of the human terrain, as a defining element of the urban area and for its effect on the geography of the urban area. We will continue to use OCOKA-W to guide our planning in regards to the physical terrain, but we will additionally consider the cultural elements using the acronym ASCOPE (Area, Structures, Capabilities, Organizations, People, Events).

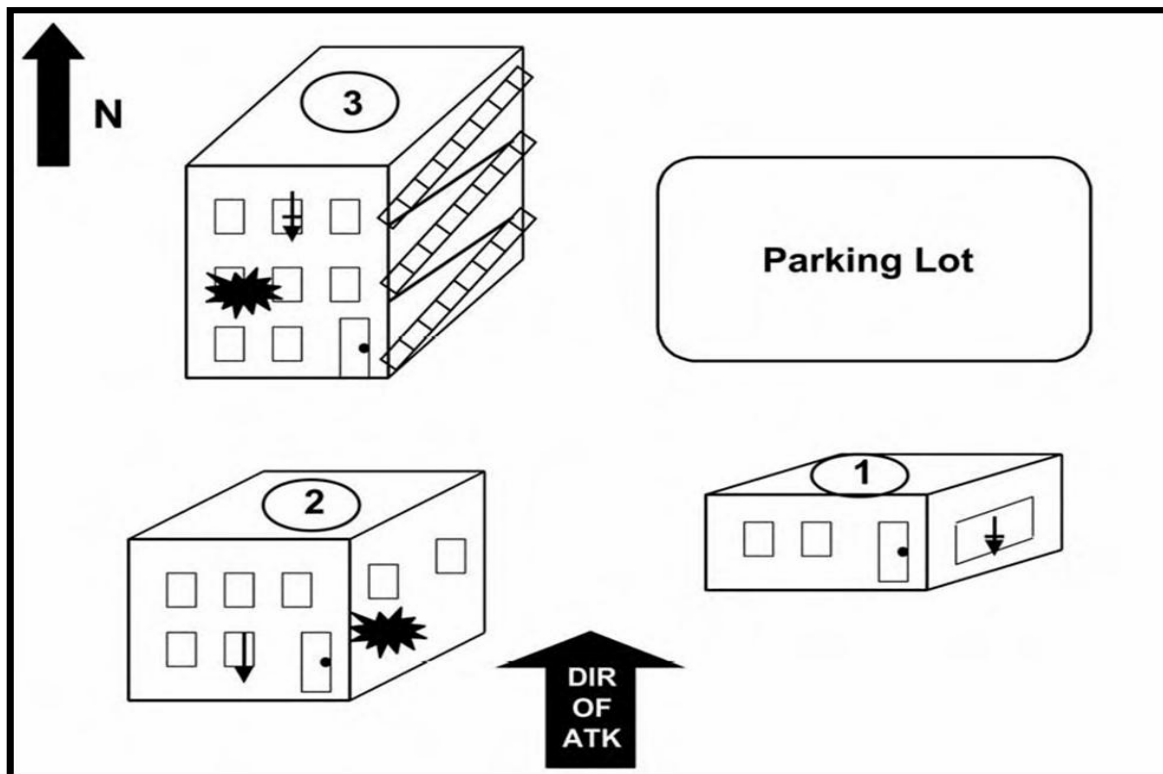
1. OCOKA-W

- **Observation and Fields of Fire.** Urbanized terrain is characterized by both restrictive and permissive observation and fields of fire. Buildings, walls, and other manmade structures limit visibility and create vast amounts of dead space, while tall buildings, towers, and other structures may provide perches which enhance line of sight for observation and communication as well as for weapons (at the expense of being highly visible). Buildings will concentrate fire down streets and alleys, but restrict fires between blocks. Rooms will restrict fires within structures.
- **Cover and Concealment.** Buildings, walls, sewers, and subways can provide excellent cover and concealment for enemy and friendly forces. The civilian population may also offer cover and concealment to irregular enemy forces. Different types of building composition offer varying protection against munitions' effects. Shadows and darkness between and inside buildings, as well as artificial light systems common in urban areas, create changing light conditions that can be exploited for concealment or surprise.
- **Obstacles.** Natural or manmade obstacles restrict or deny maneuver within the urban area. Canals, rivers, walls, fences, and rubble should be thoroughly analyzed. Construction sites and commercial operations such as lumberyards, brickyards, steelyards, and railroad maintenance yards are primary sources of obstacle and barrier construction materials. These sites can also supply engineers with materials to strengthen existing obstacles or to set up antitank hedgehogs or crib-type roadblocks. Vehicles and heavy furniture may also be used to construct obstacles.
- **Key Terrain.** All kinds of structures can be tactically significant terrain. They may be important because of the observation they provide, or the cover that defenders inside enjoy. Other structures are significant because of the services they offer. Examples of key terrain are airports or airfields, power plants, water works, dams, and bridges.
- **Avenues of Approach.** Highways, roads, bridges, alleys, building tops, sewers, and subways are just some examples of urban avenues of approach. These can be natural choke points, they may provide cover and concealment, or allow for easy top down attacks. It is critical to understand the advantages and disadvantages of every avenue of approach and how to exploit each one. They are categorized as building level, street level, subterranean level, and air level. Military maps rarely show the subterranean networks in cities, and local maps should be used to cover this gap.
- **Weather.** As in any military operation, weather affects equipment, movement, and visibility, but its greatest impact is on the individual Marine. Snow, ice, dust, wind, rain, humidity, and temperature extremes reduce human efficiency. Weather extremes coupled with stress and the physical strain of urban combat can be

minimized with effective small-unit leadership. Weather also affects the civilian population, and can be used to find times when the streets will be vacant.

APERTURE ANALYSIS

During offensive operations, a key function that the leader must perform is an aperture analysis of the buildings that he is responsible for attacking. This analysis enables him to determine the number of apertures (windows, doors, holes due to weapons effects) in the building. It also provides key information that he needs to know about the buildings in order to accomplish his mission, such as apertures to be suppressed and where possible points of entry and exit are located. (A similar application can be applied in the defense to determine how the enemy would attack buildings that friendly units are defending.) A technique for conducting this analysis is shown below.



Aperture Analysis (buildings comprising the objective)

Bldg No	Construction Type	Floors	Rooms	Stair Wells	Basements Y/N/U	Apertures	Dir of Fire	Loc of Req Suppress (Entry/Exit)	Known Threat
1	Mass Brick	1	3	None	Unk	3 x S 1 x E	360-90 360-90	None Window E	Med MG
2	Mass Brick	2	6	1 Inside	Unk	6 x S 3 x E	270-90 270-360	Window 2, 1 st Floor Entry thru Mouse Hole	Sqd (-) Light MG
3	Framed, Block	3	9	3 Inside/ Outside	Yes	9 X S	270-90	Window 2, 3 rd Floor Entry thru Door	Sqd (-) Med MG

Completed aperture analysis for an attack

Terrain Specific Questions for Leaders

Leaders should be able to answer the following questions after they have completed their terrain and weather analyses.

- Where are the streets, alleys, “through-building” routes, subterranean passageways, that provide mounted and dismounted avenues of approach and mobility corridors within the company’s AO?
- What are the number, types, and strength of buildings in the AO?
- What and where is the rubble that helps or hinders movement?
- Which buildings present fire hazards to assault or support elements?
- Where are the building locations for support-by-fire positions (ability to withstand backblast or overpressure, ability to support vehicle weight)?
- How many kill zones (parking lots, streets, rooftops, wide boulevards) are in the AO?
- Which buildings, rooftops, intersections, or other surrounding terrain provides observation and fields of fire?
- What is the number of apertures for each building in the objective area, building composition, and likely weapons needed to suppress and breach?
- What are the current conditions of the objective area and the effects of preparatory fires?
- Where are the counterattack routes?
- Where are the urban terrain features on which to place control measures?
- What are the effects on smoke and obscuration?
- What are the effects of weather on men and equipment (visibility, temperature, precipitation, humidity, survivability, and mobility)?
- Where are the locations of noncombatants and what is their disposition to friendly and enemy forces (hostile, friendly, neutral)?

2. ASCOPE and Its Applications

- **Areas.** These are areas that have significance to the local population. As planners we must examine tribal boundaries, religious and political influences, and the physical location of local centers of business, religion, and politics in order to guide us in the application of our influence and force.
- **Structures.** Planners for urban operations must understand the impact of particular physical structures in an assigned area. While hospitals and mosques might quickly come to mind as politically and culturally sensitive structures, such locations as schools, monuments, and cemeteries might also have a great impact on the success or failure of a mission. When Marines use some structures for a tactical advantage, the population may have a negative response to the occupation of the structure. This must be taken into account during operations. Other structures are high value targets to insurgents, police stations and rival mosques for example, and their security must be factored into planning operations.
- **Capabilities.** These are the functions and services that local authorities provide. Examples include courts, hospitals, police, firefighters, and things as basic as drinking water and sanitization. We may use the local police to assist us, or coordinate for firefighting and medical assistance. To gain the support of the population we can assist the locals in improving their capabilities.

- **Organizations.** People with a shared interest or goal make up organizations. These can be religious groups, criminal organizations, foreign nongovernmental organizations, or a host of other entities. We will support some and eliminate others, but we must first identify how each organization can help or hurt our mission.
- **People.** Key individuals in any area must be considered as important as key terrain. These people's support or opposition can affect our mission. Marine leaders will interact with tribal, religious, or political leaders who can influence the population.
- **Events.** Each culture maintains key dates that are important to them for different reasons. We have seen how particular dates or calendar events can be connected to a rise in insurgent activity in Iraq. This is not an isolated phenomenon and can be expected in any urban operations environment. The battle of Hue City was a result of the Tet Offensive in 1968 when the North Vietnamese used a holiday as an impetus for their massive assault on South Vietnam. Elections may entice the enemy to attack us or the general population. Weddings and funerals will draw crowds, and may include celebratory gunfire. We must understand what events will take place in our area of operations, and plan for the population's reaction to these events.

Summary

It is imperative that we understand how to properly plan for urban operations. In order to accomplish this we must develop the ability to consider those geographic characteristics that are unique to the urban environment and also to properly examine the cultural and demographic characteristics of a particular people or region. OCOKA-W and ASCOPE are two extremely valuable acronyms that will help you organize your thoughts and develop a plan in any urban environment.

As the global population grows and becomes more urbanized, we as a Corps must maintain our skill at conducting urban operations. A proper understanding of the "3-Block War" concept will allow us to plan appropriately. The leadership of our Corps has outlined the intent and it is up to us as executors to affect the training and operational success demanded of us.

References

Reference Number or Author	Reference Title
MCDP 1	Warfighting
MCDP 1-0	Marine Corps Operations
MCWP 3-11.1	Marine Rifle Company/Platoon
MCWP 3-35.3	Military Operations on Urbanized Terrain (MOUT)

MCRP 3-11.1B	Small Unit Leader's Guide to Weather and Terrain
MCRP 3-16C	Tactics, Techniques, and Procedures for Fire Support for the Combined Arms Commander
MCWP 3-33.5	Joint Marine Corps/Army COIN Manual
MCWP 3-11.3	Scouting and Patrolling

Glossary of Terms and Acronyms

Term or Acronym	Definition or Identification
ASCOPE	Acronym used to guide civil and cultural planning considerations. (Area, Structures, Capabilities, Organizations, People, Events)
METT-TC	Mission, Enemy, Terrain and Weather, Troops and Support available — Time available, Civil
OCOKA-W	Observation and fields of fire, Cover and Concealment, Obstacles, Key terrain, Avenues of approach -- Weather
Over Pressure	Pressure in excess of normal atmospheric pressure, as that caused by an explosion's shock wave or created in an accelerating airplane.
Ricochet	The motion of an object or a projectile in rebounding or deflecting one or more times from the surface over which it is passing or against which it hits a glancing blow.
ROE	Rules of Engagement

Notes
