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STUDENT OUTLINE

INTRODUCTION TO MILITARY OPERATIONS ON URBAN TERRAIN

LESSON PURPOSE: The purpose of this lesson is to introduce a Marine to the considerations for operating in an urban environment. The lesson consists of the following main ideas:

- a. Elements of urban warfare.
- b. Avenues of approach in an urban environment.
- c. Rules of engagement in an urban environment.
- d. Considerations for offensive operations in an urban environment.
- e. Considerations for defensive operations in an urban environment.
- f. Organization of an infantry unit in an urban environment.
- g. Aspects of infantry weapon employment in an urban environment.

1. The Marine Corps Role in Urban Warfare

a. As the Nation's force in readiness, forward deployed with expeditionary forces, Marines must be prepared to fight on urbanized terrain. In the past two decades, Marine Air Ground Task Force (MAGTF) ranging in size from Marine Expeditionary Forces (MEF) through Marine Expeditionary Units (MEU) have participated in military operations on urban terrain (MOUT). The task-organization and combined-arms aspect of the MAGTF makes it well suited for combat on urbanized terrain.

(1) The results of geographical studies show that 60 percent of politically significant urban areas outside allied or former Warsaw Pact territory are located along or within 25 miles of a coastline; 75 percent are within 150 miles; 87 percent are within 300 miles; 95 percent are within 600 miles; and all are within 800 miles. U.S. embassies and diplomatic facilities are primarily located in cities where the host country's political and economic leadership is concentrated.

(2) The Marine Corps will continue to play a prominent role in future evacuations of U.S. citizens, as well as the conduct of peace, counterinsurgency, and contingency operations centered on urbanized areas.

(3) Today's Marine air-ground task forces (MAGTFs) are deployed as part of Naval Expeditionary Forces (NEFs) that maintain a global forward presence for rapid crisis response. These integrated combined-arms forces are part of

the Nation's proven contingency and naval power projection force. Therefore, Marines may find themselves rapidly deployed and employed in actions across the spectrum of military operations. Many of these trouble spots will likely be located in or around large urban centers.

(4) In the years since World War II, the United States has employed military force more than 200 times. Of these, four out of five involved naval forces, and the majority of the naval efforts included Marines embarked in amphibious ships. The reasons are straightforward: availability and adaptability. Availability derives from the loiter time of forward deployed forces embarked on amphibious shipping.

(5) Adaptability comes from the Marine Corps' MAGTF organization, doctrine, training, and equipment, which prepare us for expeditionary missions from the sea in support of a variety of missions, including forcible entry.

(6) Enhancing our adaptability are the maritime prepositioning forces (MPFs). MPFs provide a rapid buildup of combat and logistics equipment that is joined with Marines on a distant shore, creating a substantial combat force. Despite our availability and adaptability, the prospect of urban warfare combined with an amphibious assault is a complex task, which requires special preparation.

(7) At the outset of a developing situation, forward-deployed expeditionary forces can move quickly within range of a crisis that threatens the political stability of a country. Urban intervention operations must often be planned and executed in a matter of hours or days (rather than weeks or months) to take advantage of the internal turmoil surrounding a developing crisis. Navy and Marine forces should anticipate deployment to urbanized areas on a day-to-day basis.

b. Multiple Avenues of Approach

(1) Urbanized terrain is a unique battlespace that provides both attacker and defender with numerous and varied avenues of approach and fields of fire. 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.

(2) 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 antitank weapons optimum positioning to allow engagement from above, exploiting an inherent weakness found in most armored vehicles.

(3) 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.

(4) 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. 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.

(5) 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 obstacles on the streets do not affect aviation assets, 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.

2. Elements of Urban Warfare

a. Urban warfare is as old as war itself. Since man began building villages, he has fought battles in and around them. Geography, politics, and economics dictate that cities will continue to be an objective of armies in warfare. From the armies that invaded and liberated Europe twice during the 20th century, to the forces that fought in Korea and Vietnam, to our most recent urban battles in the Middle East and Southwest Asia, the basic principles of combat in built-up areas have essentially remained unchanged in this century. While the principles remain the same, the introduction of helicopters, fixed-wing aircraft, armor, and precision-guided munitions (PGMs) has altered some of the techniques associated with urban combat. Surprise, combined arms, infantry, combat forces, time, isolation, and cost are some important factors that have not changed in an urban environment.

b. Surprise. Surprise is a combat multiplier and can substantially reduce the cost of urban warfare. It can be achieved through deception, stealth, and ambiguity. Surprise was achieved by the attacker at Aachen and Ban Me Thuot and by the defender at Suez City. Surprise can be an important asset to increase leverage, but, as the failure at Arnhem shows, not necessarily a decisive one. When surprise is employed as a means to overcome other disadvantages, it is important to maintain accurate intelligence. In urban areas, tactical surprise by the attacker can be used to preempt effective defensive preparation of a city.

c. Combined Arms. The MAGTF must capitalize on one of the key means for gaining advantage in maneuver warfare – the use of combined arms. The use of combined arms places the enemy in a dilemma. Any action the enemy takes to avoid one combat arm makes him more vulnerable to another.

d. Infantry. Combat in urban areas is primarily a small-unit, infantry intensive operation. Restrictions on maneuver, particularly for mechanized units, increase opportunities for infiltration. Urban combat requires small-unit leadership, initiative, and skill. Decentralized actions and difficulties in command, control, and communications are typically encountered. Built-up areas, like close terrain found in other operational environments, are generally considered to be most suited for operations conducted by infantry. Infantry units can be organized; trained and equipped to negotiate urbanized terrain that restricts observation, fields of fire, and mechanized movement.

e. Combat Forces. Whether attacking or defending, the size of the force relative to the enemy can be critical to success. When provided with adequate forces, the attacker can isolate and encircle the defender and prevent a breakout or linkup. The defender can use them to create a mobile defense or

to create strong reserves for counterattacks. Other factors that impact on the size of forces required are the degree of surprise achieved and the firepower utilized (aviation, armor, artillery, mortars, etc.). They should be weighed against the sophistication of the prepared defense. Ample consideration should be given to the local population, degree of external support, and utilization of existing services (communications, water, etc.).

f. Time. Regardless of the size or quality of defensive forces, the defender usually extracts large costs from the attacker in time, resources, and casualties. In most cases, successful conclusion of an urban battle took two to three times longer than the initial estimates. Consequently, the additional time resulted in the expenditure of more logistics and the loss of more personnel than initially anticipated. This often had adverse effects on the overall campaign. A well-planned urban defense, even if the defender is isolated or lacking in aviation, armor, or artillery weapons, can be time consuming to the attacker. Time can allow the defender to reorganize, redeploy, or marshal resources in other areas. Generally, urban warfare is time consuming.

g. Isolation. The attacker won all urban battles where the defender was totally isolated. Even the partial isolation of the defenders resulted in attackers enjoying a success rate of 80 percent. Conversely, attackers won only 50 percent of the battles in which defenders were not significantly isolated, and those victories came at great cost. No single factor is more important to the attacker's success than isolation of the urban area. In most urban battles, some form of isolation occurred as a result of the attacker's actions. While it is unrealistic to envision complete isolation of a city until enemy forces to the rear of the city are pushed far beyond its outermost boundaries, total isolation does not appear necessary. The key to the attacker's success is in stemming the unimpeded flow of manpower, supplies, and weapons to replace the defender's losses.

h. Cost. The cost of conducting urban warfare is relative to the percentage of total expended resources, the time elapsed, and the results achieved. The cost to the attacker was considered high in the majority of urban battles. A high cost does not necessarily imply that the results were not worth the price. The attacker and defender must thoroughly evaluate the overall cost prior to committing to an urban battle.

(1) From the offensive point of view, several factors can be associated with cost. First, and most importantly, isolating the urban area is critical to the attacker's success. Second, overwhelming superiority is needed if all costs are to be minimized. Third, the operation should be carefully planned. Fourth, intelligence is invaluable. Knowing where and how the city has been prepared for defense is also important. Fifth, attacking forces should understand the unique nature of urban combat. Clear tactics, techniques, and procedures for urban combat are required. Every aspect, from taking a building to using destructive technology and coordinating combined arms, must be thoroughly understood. Careful consideration of these five factors can minimize the cost of urban warfare to the attacker. Attacker cost was generally high in casualties, time, and resources in the majority of urban battles studied.

(2) From the standpoint of the defender, the critical variable is the defensive preparation of the city. Defensive preparations should include measures to prevent isolation of the city by the attackers. The capture of a prepared city can be made to be extremely costly. Preparations can include

creating kill zones, clearing fields of fire, constructing canalizing obstacles, establishing reinforcing and fall-back positions, decentralizing command and control, and organizing multiple movement routes above ground, between rooftops, and below ground in subways and sewers. Artillery and aviation support can also be valuable force multipliers in defense.

3. Rules of Engagement (ROE)

a. The nature of the military operation may restrict our use of weapons. ROEs are "directives issued by competent military authority which delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered". The Joint Task Force (JTF) Commander usually sets ROE for Marine forces. They are based on National Command Authorities (NCA) guidance, the mission, the threat, the laws of war, and host nation constraints on force deployment. The majority of urban battles since 1967 (such as Beirut II, Hue, Jerusalem) have had one or more of the following restrictions imposed on the attacking force:

(1) Minimizing civilian casualties and/or collateral destruction in order to:

- (a) Avoiding alienation of the local population.
- (b) Reducing the risk of adverse world or domestic opinion.
- (c) Preserving facilities for future use.
- (d) Preserving cultural facilities and grounds.

(2) Limiting the use of specific ground or air weapons.

b. Example of Rules of Engagement

(1) ROE Used for Operation United Shield. Nothing in these Rules of Engagement limits your right to take appropriate action to defend yourself and your unit.

(a) You have the right to use deadly force in response to a hostile act or when there is a clear indication of hostile intent.

(b) Hostile fire may be returned effectively and promptly to stop a hostile act.

(c) When US forces are attacked by unarmed hostile elements, mobs and/or rioters, US forces should use the minimum force necessary under the circumstances and proportional to the threat.

(d) Inside designated security zones, once a hostile act or hostile intent is demonstrated; you have the right to use minimum force to prevent armed individuals/crew-served weapons from endangering US/UNOSOM II forces. This includes deadly force.

(e) Detention of civilians is authorized for security reasons or in self-defense.

c. Remember:

1. The United States is not at war.
2. Treat all persons with dignity and respect.
3. Use minimum force to carry out mission.
4. Always be prepared to act in self-defense.

4. Offensive Operations

a. Reasons for Attacking a Built-Up Area. A commander considers the following before deciding to attack a built-up area:

(1) Tactical Advantage. Cities control key routes of commerce and provide a tactical advantage to the commander who controls them. Control of features such as bridges, railways, and road networks can have a significant impact on future operations. Urbanized areas may be used by the enemy as a base of operations from which they launch their own offensive operations. It may be advantageous to attack those bases and separate the enemy from their support infrastructure.

(2) Enemy Threat Too Great To Bypass. Though the terrain around a built-up area may facilitate its bypass, the enemy within that urbanized area may remain a threat, capable of interdicting lines of communications. This may require the enemy force to be contained or destroyed.

(3) Terrain Does Not Allow Bypass. The urbanized area may sit between two natural slopes on the avenue of approach and thus require capture in order to secure the main supply route. Additionally, the urbanized area, itself, may sit on dominating terrain that threatens combat support and CSS elements.

b. Reasons for Not Attacking a Built-Up Area. The commander considers the following reasons for not attacking a built-up area:

(1) Built-Up Area Not Required To Support Future Operations. The attacker may have adequate supply support and resources established at another site from which combat forces can be supported. Therefore, during the estimate process, commanders may assess that the urbanized area is not necessary to support future operations.

(2) Enemy Not a Threat. The commander may decide to bypass upon determination that no substantial threat exists in the built-up area that could affect the unit's ability to accomplish its mission.

(3) Time or Risk Unacceptable. The commander's intent may dictate that speed of movement is essential to the mission. Because MOUT can be time-consuming, the commander may choose to bypass the urbanized area to maintain tempo. Furthermore, the potential for numerous casualties, the expenditure of critical resources, or the restrictions placed on attacking forces may result in unacceptable risks to the commander's primary mission.

(4) Declared an Open City. The area may have been declared an "open city" because it is undefended or of religious or historical significance. By international agreements, open cities are demilitarized and must be neither defended nor attacked.

5. Defensive Operations

a. The essence of defensive tactics is to place the enemy into a position that permits his destruction through the intelligent use of terrain and firepower.

(1) In urban combat, the defender possesses key advantages over the attacker. The defender can shape the battlespace to his advantage by maximizing the natural restrictions and obstacles found in the urban environment. ROE for the attacker can add to the defender's advantage by placing restrictions on the application of force by the attacker. Knowledge of the terrain and time available for preparing defensive positions are advantages, which may enable the defender to successfully resist a numerically superior force. A spirited and stubborn defense may persuade an attacker to abandon the attack. In some battles, urban defenders can be credited with repelling or decisively delaying an attacker, which ultimately influenced the course of the war in their favor.

(2) The fundamentals of defense do not change in an urban environment. The defenders of a city, however, usually have detailed knowledge of the terrain. This will allow them to establish an extensive defensive network that is designed to force an attacker to expend exorbitant amounts of time, supplies, equipment, and manpower. Commanders need to recognize both the advantages and disadvantages of defensive operations in an urban environment.

b. Reasons for defending built-up areas. Historically, the following are some of the reasons for defending built-up areas:

(1) Denial of important strategic/political objectives. Capitals and cultural centers can be defended strictly for psychological or national morale purposes even if they do not offer a tactical advantage to the defender. Defending a city can cause an attacker to commit a significant amount of his forces, which reduces his capability to attack elsewhere. The defense of a city can delay the overall offensive capability of the attacker.

(2) Retention of key economic centers. In many countries, the entire nation's economic well-being may be tied to a few key cities. These key cities usually contain the country's primary industrial, transportation, and communications base. The capture of these key centers could result in the overthrow of the current government, or deny that government the ability to adequately support combat operations against enemy regular or insurgent forces.

(3) Control of avenues of approach. Most avenues of approach to large cities are straddled by small towns every few kilometers, which must be controlled by defending forces. These areas can be used as battle positions or strongpoints to control the avenues of approach. For the attacker to utilize these avenues of approach he must sacrifice speed and expend resources. The defense of these cities or towns may constitute a large part of the overall defense of a city.

(4) Economy of force. The tactical advantages provided by urbanized terrain allow the defender to engage a numerically superior force. The defender can conserve the bulk of his combat power so that it is available for use in other operations.

(5) Concealment of forces. Reconnaissance and combat identification is more difficult in an urban environment. CPs, reserves, CSS complexes, and combat forces emplaced in built-up areas are much harder to detect.

c. Reasons for not defending built-up areas. The commander considers the following reasons for deciding not to defend built-up areas.

(1) Unnecessary to the defensive or offensive plan. If the built-up area is too far forward or back in a unit's defensive sector, is isolated, or is not astride an enemy's expected avenue of approach, the commander may choose not to defend it.

(2) Bypassable. If the nature of nearby terrain allows the enemy to bypass the city, then it will not make a good blocking position. Some built-up areas, mainly smaller ones, are easily bypassed by existing main road and highway systems. A built-up area that can be easily bypassed normally will be, thereby effectively isolating that area's defenders from the remainder of their forces.

(3) Inadequate structures for defense. Extensive areas of lightly built or flammable structures offer little protection to the defender. Built-up areas near flammable or hazardous industrial areas, such as refineries or chemical plants, also may not lend themselves to successful defense.

(4) Adjacent dominating terrain. If the built-up area is small and dominated by close, prominent terrain, the commander may choose to defend on that terrain rather than in the built-up area.

(5) Better fields of fire elsewhere. The commander may choose to base all or part of his defense on the better fields of fire that exist outside built-up areas. An example would be an armor-heavy force defending in sectors from multiple, small, built-up areas surrounded by open or farm-type areas.

6. Organization for Urban Combat. The basic infantry organization structure does not change when the battlefield is moved into an urban area. However, infantry units may be tasked-organized or reinforced down to the squad level in order for small units to fight and win in this violent and three-dimensional battlefield.

a. Platoon Organization. Consists of an assault force, support force, and a security force. The Platoon Commander will position himself where he can best control the battle.

(1) Assault Force. The assault force is responsible for assaulting enemy positions. They are also responsible for creating entry points and breaching obstacles when engineers are not available. The assault force's sole purpose is the time-honored tradition of closing with and destroying the enemy by fire and maneuver.

(2) Support Force. The support force is responsible for providing support and accurate supporting fire for the assault force. It will normally consist of several crew served weapons, special equipment and additional infantry.

(3) Security Force. The security force is responsible for providing security for the assault force's movement. They also have the on order mission of becoming assault force two.

b. Squad Organization of the Assault Force. The assault force consists of three elements. An assault element, support element, and a security element. The composition of the assault force will vary depending on the situation.

(1) Assault Element. The assault element is responsible for assaulting enemy positions. They are also responsible for creating entry points and breaching obstacles when engineers are not available. The assault element's sole purpose is the time-honored tradition of closing with and destroying the enemy by fire and maneuver.

(2) Support Element. The support element is responsible for providing support and accurate supporting fire for the assault on an enemy position. The support element for a Marine rifle squad will consist of one fire team that could be reinforced with heavy machine guns, antitank weapons, and/or armored vehicles. They are task organized and may consist of all the M249's in the squad. The support element provides fire support necessary to advance the assault element.

(3) Security Element. The security element is responsible for providing security for the assault element's movement. The security element isolates the immediate area by providing security to the flanks and rear of the advancing assault element. They also have the on order mission of becoming assault element two.

c. All three fire teams must be organized to assume the mission of the assault element, as this is certain to arise frequently in urban combat.

7. Weapons Employment

a. M16 Rifle and M249 Squad Automatic Weapon. The M16A2 rifle and the M249 squad automatic weapon are the most common weapons used in combat in built-up areas. The M16A2 rifle and the M249 are used to kill enemy personnel, to suppress enemy fire and observation, and to penetrate light cover. Leaders can use 5.56-mm tracer fire to designate targets for other weapons.

(1) Employment. Close combat is the predominant characteristic of urban engagements. Marine riflemen must be able to hit small, fleeting targets from bunker apertures, windows, and loopholes. This requires pinpoint accuracy with weapons fired in the semiautomatic mode. Killing an enemy through an 8 inch loophole at a range of 50 meters is a challenge, but one that may be common in combat in built-up areas.

(2) Within built-up areas, burning debris, reduced ambient light, strong shadow patterns of varying density, and smoke all limit the effectiveness of night vision and sighting devices. Aiming stakes and noise/light booby traps coupled with night vision goggles and firing techniques can be used in the defense. During the offense, night vision goggles and illumination munitions can be used. Any Marine using night vision goggles should be teamed with at least one Marine not wearing them.

(3) Weapon Penetration. The penetration that can be achieved with a 5.56mm round depends on the range to the target and the type of material being fired against. Single 5.56mm rounds are not effective against structural materials, as opposed to partitions, when fired at close range, the closer the range the less the penetration.

b. Machine guns. In the urban environment, the .50 caliber machine gun and the 7.62mm M240G machine gun provide high-volume, long-range, automatic fires for the suppression or destruction of targets. They provide final protective fires 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, but the .50 caliber tracer is more apt to do so.

(1) Employment. The primary consideration affecting the employment of machine guns within built-up areas is the limited availability of long-range fields of fire. Although machine guns should be emplaced at the lowest level possible, grazing fire at ground level is often obstructed by rubble.

(2) Penetration. The ability of the 7.62mm and .50 caliber rounds to penetrate is also affected by the range to the target and type of material against which the rounds are fired. Close ranges affect penetration of the 7.62mm round less than the 5.56mm round.

c. Grenade Launchers, 40mm (M203 and MK19). Both the M203 dual-purpose weapon and the MK19 grenade machine gun fire 40-mm HE and HE dual-purpose (HEDP) ammunition. Ammunition for these weapons is not interchangeable, but the grenade and fuse assembly that actually hits the target is identical. Both weapons provide point and area destructive fires as well as suppression. The MK19 has a much higher rate of fire and a longer range. The M203 is much lighter and more maneuverable.

(1) Employment. The main consideration affecting the employment of 40mm grenades within built-up areas is the typically short engagement range. The 40mm 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. Both the HE and HEDP rounds have 5-meter burst radii against exposed forces, which means that the minimum safe firing range for combat is 33 meters. The 40mm grenades can be used to suppress the enemy in a building or inflict casualties by firing through apertures or windows. The MK19 can use its high rate of fire to concentrate rounds against light structures. This concentrated fire can create extensive damage. The 40mm HEDP round can penetrate the armor on the flank, rear, and top of Soviet-made BMPs and BTRs. Marines can use the M203 from upper stories to deliver accurate fire against the top decks of armored vehicles. Multiple hits are normally required to achieve a kill.

(2) Weapon Penetration. The 40mm 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, 40mm rounds achieve the same penetration regardless of range.

d. 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. This category of weapons includes the AT4, the M47 Dragon, and the SMAW.

(1) AT4. The AT4 can penetrate more than 17.5 inches of armor plate. Its warhead produces highly destructive results behind the armor. Tests against typical urban targets are still ongoing, but the AT4 should penetrate at least as well as the 90mm recoilless rifle, if not better. The AT4 has a

minimum arming distance of 10 meters, which allows it to be fired successfully against close targets. Firers should be well covered and protected when firing at close targets.

(2) MK153 83mm SMAW. The SMAW is a lightweight assault weapon that is easily carried and placed into action by one man. It is used against fortified positions, but it is also effective against LAVs. The SMAW has a 9-mm spotting rifle and a 3.8-power telescope that ensure accuracy over ranges common to combat in built-up areas. The SMAW has excellent incapacitating effects for enemies behind walls and inside bunkers and can arm within 10 meters. Its fuze has the ability to distinguish between armor and soft earth, maximizing its capabilities against buildings, bunkers, or light armor. The warhead detonates immediately against hard targets but delays detonation against soft targets and burrows in to explode inside. The SMAW can destroy most bunkers with a single hit. The 83mm HE warhead can create an 8-inch mouse hole in reinforced concrete but will not cut the steel reinforcing bar. The SMAW is an outstanding urban support weapon that can be decisive during an urban assault. The SMAW allows for quick reduction of obstacles and bunkers as well as creation of entry points. SMAWs fired in a volley can be devastating to a building.

(a) Wall breaching. Wall breaching is a common combat task in built-up areas for which light recoilless weapons can be used. 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. Breaching holes for unit mobility should be about 24 inches in diameter. Loopholes should be about 8 inches in diameter. Only the SMAW provides a one-shot wall breaching ability. However, in breaching walls a number of shots should be planned.

e. Antitank guided missiles. ATGMs are used mainly to defeat main battle tanks and other armored combat vehicles. They have a moderate capability against bunkers, buildings, and other fortified targets commonly found during combat in built-up areas. This category of weapons includes the TOW and Dragon missiles.

(1) Javelin missile. Javelin is a fire-and-forget missile with lock-on before launch and automatic self-guidance. The range of the missile is 2,500m. A soft launch ejects the missile from the launch tube to give a low-recoil shoulder launch. The soft launch enables firing from inside buildings or covered positions. The gunner can use the direct attack feature to engage covered targets, bunkers, buildings and helicopters.

(2) TOW missile. The basic TOW missile can penetrate 8 feet of packed earth, 4 feet of reinforced concrete, or 16 inches of steel plate. The improved TOW (ITOW), the TOW 2, and the TOW 2A have all been modified to improve their penetration. They all penetrate better than the basic TOW. All TOW missiles can defeat triple sandbag walls, double layers of earth-filled 55-gallon drums, and 18-inch log walls.

f. Mortars. The urban environment greatly restricts low-angle indirect fires because of overhead masking. While all indirect-fire weapons are subject to overhead masking, mortars are less affected than field artillery weapons because of the mortar's higher trajectory. For low-angle artillery fire, dead space 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 than field artillery to the infantry during combat in built-up areas.

(1) Employment. Not only can mortars fire into the deep defilade created by tall buildings, but they can also fire out of it. Mortars emplaced behind buildings are difficult for the enemy to accurately locate and even harder to hit with counterfire. Because of their lightweight, even heavy mortars can be hand-carried to firing positions that may not be accessible to vehicles.

(a) The 60mm and 81mm mortars have limited effects on structural targets. Even with delay fuzes, they seldom penetrate more than the upper stories of light buildings. However, their wide area coverage and multi-option fuzes make them useful against an enemy force advancing through streets, through other open areas, or over rubble.

(b) Mortar platoons often operate as separate firing sections during combat in built-up areas. The lack of large open areas can preclude establishing a platoon firing position. Two mortar sections that are separated by only one street can be effective in massing fires and be protected from counter-mortar fire by employing defilade and dispersion.

g. The M18A1 Claymore mine

(1) Employment. It can be employed during the reorganization and consolidation phase on likely enemy avenues of approach. It does not have to be installed in the street, but can be employed on the sides of buildings or any other sturdy structure. The claymore mine, in command-detonated mode, is currently legal for employment by U.S. forces.

(a) Claymore mines can also be used for demolition against thin-skinned buildings and walls.

(b) Claymore mines may be configured for detonation by tripwire. They can help fill the dead space in the final protective fires of automatic weapons.

(c) Claymore mines can be used in several ways in the offense. For example, if friendly forces are advancing on a city, claymore mines can be used in conjunction with blocking positions to cut off enemy avenues of escape.

h. Hand grenades. Hand grenades are used extensively during combat in built-up areas. Smoke grenades are used for screening and signaling. Riot control grenades are used to drive the enemy out of deep fortifications. Fragmentation and concussion grenades are used to clear the enemy out of rooms and basements. Hand grenades are the most-used explosive munitions during intense combat in built-up areas. In World War II, it was common for a battalion fighting in a city to use more than 500 hand grenades each day.

Reference and Pages: MCWP 3-35.3 Military Operations on Urbanized Terrain, pages 1-1 through 1-4, 1-8, 1-13, 1-16 through 1-18, 1-20, 2-1, 2-2, 3-1, 3-2, 7-5, 7-6, A-1, A-2, B-2, B-3, B-5, B-8 through B-10, B-15 through B-17, B-21, B-23, B-34, B-35, F-9, and page F-10