

Don't Go Downtown without Us

The Role of Aerospace Power in Joint Urban Operations

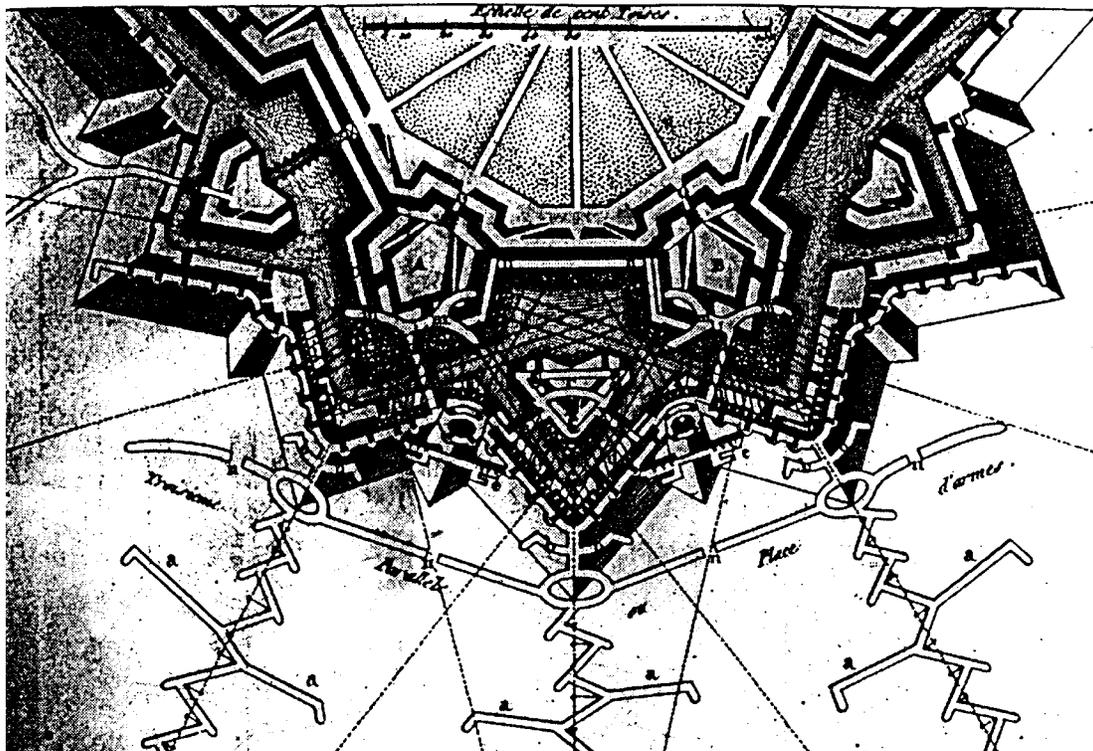
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FOR MANY PEOPLE, the term *urban operations* brings to mind the specters of Mogadishu, Hue City, and Stalingrad, where vicious, house-to-house infantry fighting was the order of the day. However, it is a mistake to view all urban operations through this bloody lens. Such operations, in fact, fall all along the spectrum of military operations—from humanitarian relief to peace support to major theater war

(MTW). Aerospace power can play a major role in helping the joint force achieve its objectives with less risk in many scenarios across this operational continuum.

For good reason, analyzing, defining, and developing an urban-focused operational capability within our armed forces has received heightened emphasis as of late. This emphasis has manifested itself in a number of key national security documents, national policy



findings, war-gaming initiatives, independent analytical studies, and operational “lessons learned” reports.

Surprisingly, this recent focus on the “urban dimension” of military operations tends to obscure the fact that, from a historical perspective, urban operations are not a new phenomenon for the Air Force or our sister services. In fact, joint aerospace power in various forms has contributed significantly to successfully executed urban operations in many recent conflicts and contingencies (fig. 1).

As these cases illustrate, aerospace power—as a specialized subset of the joint force commander’s (JFC) overall “tool box”—has consistently offered a unique set of options to increase the effectiveness of a full-spectrum joint campaign plan, while minimizing the risk to committed forces in this highly complex and uncertain environment.

The Operational Challenge

Policy makers, defense analysts, and academicians generally agree that military operations in urban environments are fraught with challenges, including complex, overlapping environmental, infrastructure, and population concerns. To meet these challenges effectively, commanders must develop plans and determine capabilities and resources appropriate to the urban arena, based on analysis of many interrelated factors, such as

- US interests and objectives
- Nature of the adversarial threat in terms of size, type, and organization
- Geopolitical and physical environments of the scenario at hand
- Domestic opinion

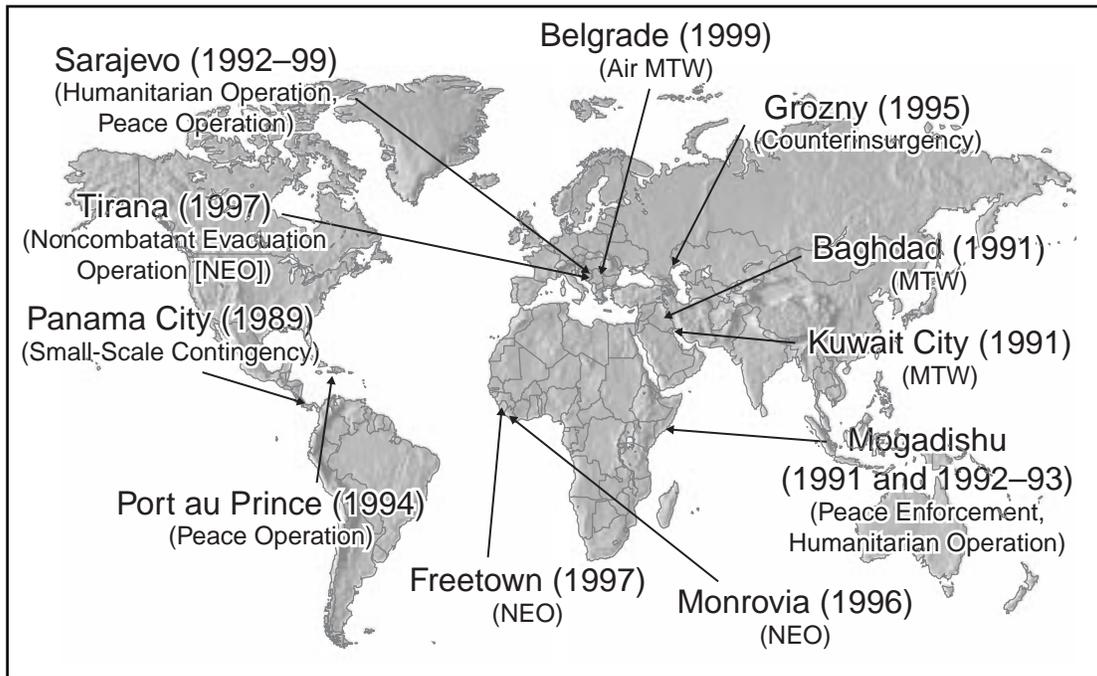


Figure 1. Selected Urban Operations since 1989. Military forces have been involved in many urban operations in the last 10 years. This graphic shows only a few of the better-known examples. Aerospace forces have played a large part in each of these operations.

- International/coalition support
- Availability and applicability of the resources at hand

Given the range of possible political and military scenarios we may face in an urban setting, policy makers and commanders must acknowledge the fact that no single recipe for success exists—not in terms of force structure, operational capability, or what one particular agency or service might bring to the table. A “one-size-fits-all” approach to urban operations—in terms of strategic-, operational-, and tactical-level considerations—is a recipe for failure. In essence the “urban fight” is, first and foremost, a “joint fight.”

Competing Views of the Urban Environment

The classic view of urban operations is that urban environments afford our adversaries distinct asymmetrical advantages that negate traditional US military strengths in the areas of firepower and technology. Proponents of this view see urban operations as extremely manpower intensive, with a focus on seizing and occupying urban terrain, close-quarters infantry combat, and “low-tech” solutions to urban battle-space management. The aerospace aspects of joint military power are largely relegated to a support role in this construct.

Some “high-end” scenarios may warrant the political risks and human costs inherent in this approach. However, since most conflicts in urban areas fall short of this mark, this traditional school of thought offers our national political leadership no realistic, actionable military options.

A competing school of thought views the city as a “system of systems” made up of various key nodes that are normally archived and susceptible to detailed effects-based targeting analysis across three dimensions. By making these key nodes the operational foci of the joint campaign, we can apply our asymmetrical, joint strengths against the adversary’s key

centers of gravity without having to close with him in predictably costly force-on-force confrontations. By using this approach, one may control an adversary without necessarily introducing a large ground-combat force, thus minimizing casualties while achieving the desired effect.

This school, we believe, is more flexible, in that it advocates applying a combination of air, ground, and maritime solutions appropriate to the situation. Instead of a territorial, house-to-house orientation, this school looks to shape and control an adversary’s behavior by achieving operational effects that may not include controlling territory at all. In the end, this approach offers the JFC a greater number of achievable, operational-level courses of action in the urban environments we are most likely to face.

Developing a Concept of Operations for Urban Operations

Most urban operations will include five components, to a greater or lesser degree (fig. 2). Rather than viewing these components as linear or sequential stages in an urban operation, one should regard them as interdependent, continuous, and frequently overlapping processes comprising a fluid joint campaign plan. As the campaign unfolds over time, the JFC will likely shift the weight of effort among the components to meet the requirements of the specific situation.

Battle-Space Analysis

Arguably the most important component of our concept of operations, battle-space analysis encompasses preparing intelligence concerning the battle space and maintaining operational-level situational awareness during all phases of the campaign—all intended to allow friendly forces to better predict, shape, control, or respond to the adversary’s intentions and/or actions. Battle-space analysis allows the JFC to capitalize on information superiority to identify the adversary’s key nodes,

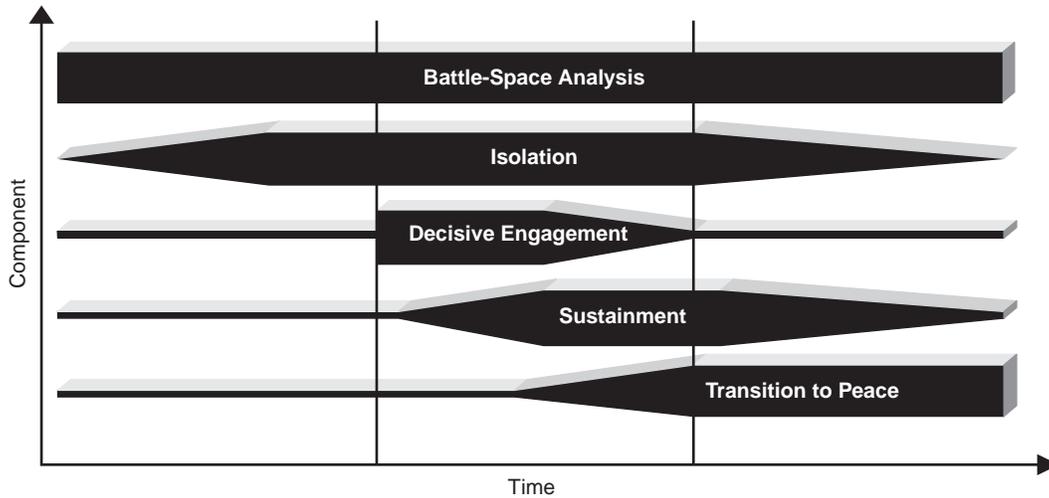


Figure 2. Hypothetical Concept of Operations

systems, and choke points central to his ability to shoot, move, and communicate across three dimensions.

Aerospace power allows the JFC to better “see” the urban battle space through a combination of space-based systems and manned and unmanned aerial platforms. These systems provide imagery, signals intelligence, and a capability to fuse multisource data into an overall common operational picture. In conjunction with archived data and ground-based human intelligence, these air and space systems enable more complete situational awareness in an urban setting. Overhead collection systems—including satellites, as well as the U-2, Predator, E-2C Hawkeye, and OH-58 aircraft, to name a few—also contribute significantly to nodal analysis, campaign planning, decision support, and rapid targeting processes.

True overhead, three-dimensional urban battle-space analysis may become possible in the future through the advent of ground-penetrating radars incorporating a mix of ground-deployed transmitters and air- and space-based receivers. This technology—currently being developed by the Air Force Research Lab—could potentially enable detection and mapping of underground urban

command posts, munitions storage sites, and so forth.

Overhead intelligence, surveillance, and reconnaissance (ISR) systems also allow the joint team to seize the initiative once hostilities begin. The moving-vehicle identification, tracking, and targeting capability provided by a wide array of sensors on overhead platforms—such as the joint surveillance, target attack radar system (JSTARS) aircraft and the AC-130 gunship—is a perfect case in point. Another system with tremendous potential in this area is the CL-327 Guardian unmanned aerial vehicle (UAV), a tactical platform designed to pass real-time, color, electro-optical, and infrared video directly to orbiting aircraft and ground stations, providing both end users with a continuous picture of the urban battle space.

With advancing technology, airborne and space-based ISR systems may also play a key future role with respect to protecting friendly forces in the urban environment. Examples include development of overhead counter-sniper and counterfire detection and targeting capabilities, as well as overhead electronic identification and tracking of friendly ground forces.

Aerospace systems—such as national satellite networks, as well as airborne warning and control system and P-3 Orion aircraft—also provide the dynamic command and control (C²) the JFC needs to exploit superior battlespace awareness and conduct high-tempo management of engaged forces. Robust overhead C², combined with real-time, three-dimensional intelligence, allows the JFC to operate effectively inside the adversary's decision-and-action cycle—a key to full-spectrum dominance during subsequent urban combat operations.

Isolation

The second component in a joint urban operation, isolation involves physically and psychologically separating an adversary from his urban support base, limiting his mobility and communication, and negating his ability to acquire useful intelligence on friendly operations. Isolation activities shape our adversary's perceptions and behavior and limit his options before hostilities begin.

Isolation also implies physical protection of the urban population from adversary attack and exploitation, as well as the unintentional collateral effects of urban combat. Isolation requires an active, scenario-dependent combination of physical, political, electronic, informational, psychological, and civil affairs measures.

Aerospace power can play a critical role in helping establish informational, physical, and psychological isolation over an adversary—thereby helping shape his perceptions and behavior. Aerospace power can also help in the formulation of population and infrastructure protection options vital to minimizing noncombatant casualties and physical destruction in an urban conflict setting. Airborne information operations such as jamming communications, broadcasting on public channels through the EC-130 aircraft, dropping leaflets, or intimidating an adversary through combat air-presence flights highlight aerospace contributions in this realm. Looking to the future, we have yet to fully explore additional concepts and tech-

PANAMA

Operation Just Cause, the US invasion of Panama in 1989, was at the time the largest and most complex air operation conducted by joint US aerospace forces since the Vietnam era. The initial joint forced-entry operation and follow-on search for Gen Manuel Noriega and his cronies involved extensive urban combat and civil pacification operations. Aerospace forces played a critical role in protecting US citizens and defeating Panamanian Defense Force (PDF) elements seeking refuge in urban areas. Parallel joint aerospace operations were key to the success of the JFC's campaign plans.

- The initial assault included 140 aircraft of 16 different types, participating in more than 250 sorties in built-up areas.
- AC-130s conducted precision strike operations and supported the urban operations of special forces throughout the country. AC-130s also destroyed the 15-building *Commandancia* complex in downtown Panama City, crippling the single most important node in the PDF national defense and C² systems.
- MC-130, C-130, C-141, and C-5 crews conducted strategic airdrop and air-land operations directly from the continental United States into built-up areas in and around the Torrijos-Tocumen and Rio Hato airfields.
- EC-130s jammed commercial broadcast stations and PDF radio nets.
- Army MH-47/MH-60s provided critical vertical mobility for ground forces.
- Aerospace power neutralized PDF units in their urban sanctuary and interdicted key reinforcing units at numerous choke points throughout the city.

nologies involving the use of nonlethal weapons from the air. This is a logical next step in capitalizing on recent advances in weapons accuracy—adding a range of nonlethal effects that may have tremendous urban application, particularly in the area of crowd control.

Decisive Engagement

The decisive-engagement component involves gaining the initiative by applying friendly strengths against the key nodes, sys-



Soldiers of the 6th Armored Division dodge sniper fire in the capture of Oberdorla, Germany, during World War II.

tems, and choke points identified during the JFC's battle-space analysis. The ultimate goal here is to weaken or destroy the adversary's cohesion, organization, C², lines of communication, and psychological balance so as to shape, modify, or control his behavior in line with the JFC's campaign plan. Continuously reassessing previous battle-space analysis and maintaining situational awareness are clear prerequisites to friendly success during decisive engagement.

Aerospace power plays an absolutely pivotal role in the decisive-engagement component of an urban operation. Aerospace forces can bring overwhelming precision firepower to bear, achieving devastating operational- and tactical-level effects against key adversary nodes. Future generations of "smart weapons" will allow even more precise effects against

high-value targets with an extremely favorable asset-to-target ratio—minimizing both the exposure of friendly forces to hostile fire and the destructive effects against noncombatants and civilian infrastructure.

The joint community is making great strides in the ability of standoff weapons to achieve very precise effects in the urban environment. The joint air-to-surface standoff missile, with a range of over one hundred miles and the capability of penetrating adverse weather, boasts extreme targeting precision. With this weapon, commanders can now literally choose the location of impact on a given urban target structure. In the near future, the standard air-delivered munition will be the joint direct-attack munition (JDAM). This "launch-and-leave" weapon, guided by the Global Positioning System, allows an aircraft to attack multiple urban targets in adverse weather. The JDAM also features selectable impact azimuth and direction, allowing it to transit an "urban canyon" and engage with great precision. Improvements in weapons fuzing also have significant urban applications. For example, the hard-target smart fuze will allow our current inventory of GBU-27s and -28s to penetrate a structure and detonate after passing through a predetermined number of open spaces, enabling precision vertical targeting by floor.

Employing these current- and future-generation weapons, tactical strike aircraft can provide key support for ground-force operations during preplanned urban strike or close air support operations. The A-10 Warthog, AV-8 Harrier, and AH-64 Apache can all provide precise and devastating fire support to degrade the adversary and prevent him from reinforcing. In the future, tactical strike aircraft will be even more closely tied to unmanned sensor assets over the urban battlefield. The Air Force Research Lab is currently exploring concepts and technology that will allow aerial sensors to illuminate and magnify urban targets for strike aircraft using standard designator-class lasers. In a parallel effort, the Air Force UAV Battlelab is experimenting with concepts that will allow sensors on board the



US troops on ground patrol in Mogadishu in the early 1990s. High-tech surveillance resources promise to supplant this type of hazardous activity.

Predator UAV to overlay real-time video onto highly accurate satellite imagery. The geolocation data derived from this combination will enable highly accurate urban targeting with precision-guided munitions.

In the mobility arena, tactical lift forces—both fixed-wing and helicopters—provide the vertical maneuver that allows the pinpoint introduction of ground forces in the urban environment in support of the overall campaign plan. Examples include fixed-wing airborne insertion and rotary-wing troop insertion via MH-53, CV-22, CH-47, and MH-60 aircraft.

Sustainment

Sustaining the momentum achieved in decisive-engagement operations is of critical importance to the JFC. Prerequisites for success

are continuous, real-time analysis of the battle space; operational effects achieved against key nodes and systems; and adversary responses. Sustainment activities may also include introducing additional forces, providing logistic support to committed forces, and capitalizing on successes by pursuing cascading effects against the enemy's remaining key nodes and systems.

In concert with ground-force operations, joint aerospace strike and mobility assets work in tandem to sustain friendly momentum, enable maneuver, and protect friendly forces in the urban environment. They can eliminate pockets of enemy resistance and resupply friendly forces on the ground, while denying our adversary this capability. Robust overhead C² and continuous data transfer from airborne sensors to strike assets enable

BOSNIA

The Bosnia case study represents the "crown jewel" example for highlighting the outcome-determining potential of airpower in an urban environment. US joint urban aerospace operations supporting United Nations (UN) and North Atlantic Treaty Organization (NATO) efforts in Bosnia provided humanitarian airdrops, relief flights and evacuations, enforcement of the UN-mandated no-fly zone, enforcement of the heavy-weapons exclusion zone around Sarajevo, and critical oversight of Sarajevo and the surrounding region.

- One hundred sixty thousand metric tons of humanitarian assistance were air-dropped or air-lifted to isolated urban areas, accounting for 85 percent of international relief into Sarajevo.
- The credible threat of NATO air strikes compelled the Bosnian Serbs to withdraw three hundred heavy weapons from Sarajevo in February 1994, with another 290 transferred to UN control.
- F-16s shot down four Serb Galeb/Jastreb fighters while enforcing the UN no-fly zone in February 1994, shaping Serb behavior and confirming allied air supremacy.
- Operation Deliberate Force, conducted in the summer of 1995, illustrates the successful combination of integrated battle-space awareness, rapid information processing and sharing, and long-range precision strike. About 75 percent of the targets struck were in urban terrain. Nearly 99.5 percent of aerial munitions used were precision-guided, producing almost no collateral damage. Operational effects achieved by the air strikes seriously altered the Bosnian Serbs' military superiority in relation to their Muslim opponents and weakened the Serbs' willingness to continue the fight, ultimately delivering them to the Dayton peace negotiations.
- After Dayton, U-2s and surveillance satellites monitored treaty compliance, helped locate mass burial sites, and delineated permanent lines separating the former warring factions. JSTARS provided oversight for NATO ground operations, tracked Serbian maneuver forces, and monitored zones-of-separation activities.
- NATO fighters and attack helicopters currently provide continuous air presence over disputed areas, help quell spontaneous civil disturbances, and enforce level treaty compliance and boundary-line integrity.

friendly forces to press the attack and achieve cascading second- and third-order effects while adversary forces are still trying to assess the damage that has been done to them.

Transition to Peace

The final component of our operational concept refers to a variety of long-term, peace-shaping operations that ultimately mark the termination of urban violence or armed conflict. These may include facilitating the introduction of international peacekeeping or humanitarian relief organizations, setting conditions for a change of regime, destroying stockpiles of conventional or unconventional weapons, monitoring the activities of rival warring factions, and so forth. Additional fea-



A street scene in Stenay, Meuse, France, on 11 November 1918, showing Company A, 353d Infantry, passing the church at 10:58 with two minutes to fight in World War I.

tures of the transition to peace involve a managed transition to a replacement military force or civilian authority, the reestablishment of critical services and infrastructure, and follow-on consequence-management operations.

Aerospace systems and platforms can serve many critical functions during the transition to peace. Long-endurance UAVs, manned ISR platforms, and continuous-coverage satellites can provide sustained oversight of the urban conflict zone. They can also provide the sensor-to-shooter data required to support long-term “air constabulary” operations. A wide range of air-to-air and air-to-ground aerospace assets is available to provide the combat punch necessary to enforce adversary compliance with peace accords, if required. In recent years, these duties have included enforcing no-fly zones, verifying adversary truce lines, and responding to weapons-cantonment violations in built-up areas.

The strategic and tactical lift capabilities provided by joint aerospace forces are integral to postconflict urban peacekeeping, humanitarian relief, infrastructure and services restoration, and consequence management. Examples include C-17, C-5, C-130, CH-47, and UH-60 operations supporting food distribution, medical evacuation, movement of international observers, and resupply operations.

An Integral Part of the Joint Team

Aerospace power offers JFCs invaluable punch in the urban fight and has contributed

substantially to recent joint urban operations at the strategic, operational, and tactical levels. Looking into the future, we must continue to define and develop appropriate applications for aerospace power in the joint urban campaign. Next-generation air- and space-based “eyes and ears,” enhanced overhead C², robust mobility, and precision strike weapons will allow us to help close significant “capability gaps” we now face in the urban environment. Through these advances, aerospace power will continue to offer a greatly expanded range of options to help shape, control, or defeat an adversary in an urban setting.

Aerospace power is integral to any concept that offers an effective military strategy while minimizing risk in an urban environment. Whether in the context of achieving direct, precision effects against key adversary nodes; decisively enabling high-tempo, parallel joint-force operations; or providing real-time, three-dimensional, actionable ISR to the JFC, aerospace power is a key lever in the joint-force urban campaign.

Failure to bring the advantages inherent in joint aerospace power to bear against our adversaries in the urban environment puts operational success seriously at risk. A full complement of joint military power—including aerospace in all its forms—is the key to achieving our national objectives in this most challenging of all operational environments. To sum it up, “Don’t go downtown without us!” □

So many men are lost in the attacks on villages that I have vowed never to undertake them.

—Frederick the Great