ANALYSIS OF US ARMY PREPARATION FOR MEGACITY OPERATIONS

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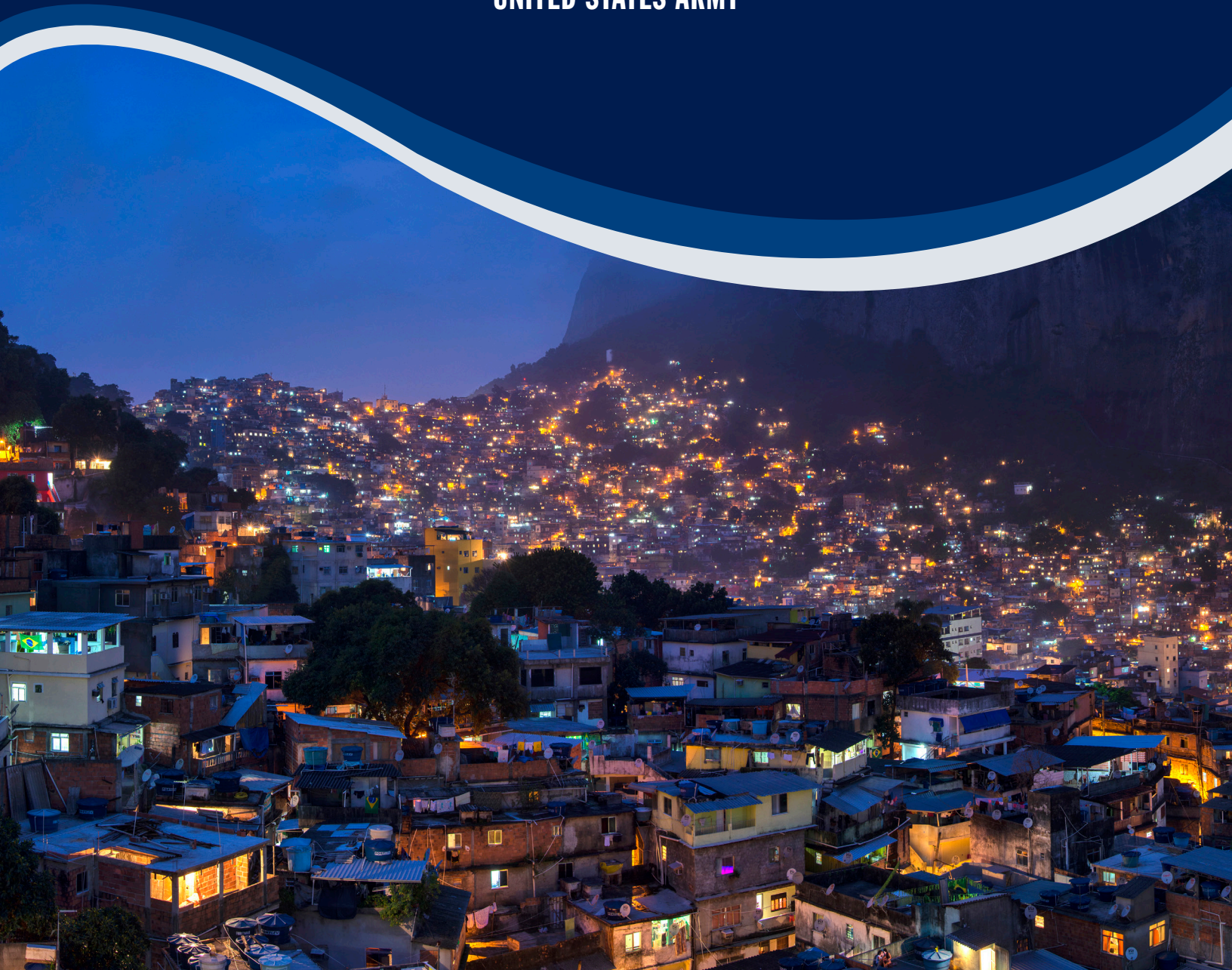
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ANALYSIS OF US ARMY PREPARATION FOR MEGACITY OPERATIONS

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Abstract

The United States US Army Chief of Staff Studies Group has identified the megacity as a future challenge to the security environment. Due to their complexity, megacities present a vulnerable and challenging future operational environment. Currently, however, the US Army is incapable of operating within the megacity. The US Army must think and learn through leveraging partnerships, which enhance institutional understanding. Historical experiences and lessons learned should assist in refining concepts and capabilities needed for the megacity. Continued leadership of an integrated joint scenario driven effort will inform future force organization and employment, and by utilizing a framework of Doctrine, Organization, Training, Materiel, Leadership, Personnel and Facilities (DOTMLPF), the US Army should prepare itself for the megacity challenge. The US Army paradigm of Think—Learn—Analyze—Implement paradigm should also aid in the preparation.

23 megacities identified as of 2011 (The Megacities Project).

"Power is shifting below and beyond the nation-state ... While largely positive, these trends can foster violent non-state actors and foment instability—especially in fragile states where governance is weak or has broken down—or invite backlash by authoritarian regimes determined to preserve the power of the state."

—National Security Strategy 2015[i]

Introduction

Throughout its history, our nation's security has relied upon land forces operating as part of joint forces to prevent conflict, shape the security environment, and create multiple options for the resolution of conflicts. As the nation's primary land force, the US Army organizes, trains, and equips forces to control terrain, secure populations, consolidate gains, and preserve joint force freedom of movement. Although there is no accurate and reliable process to predict future conflicts, the US Army Chief of Staff's Strategic Study Group (SSG) identified megacities as a security challenge within the future operating environment.[ii] The National Security Council's Global Trends 2030 posits that megacities present not only economic opportunity but also potential vulnerability due to their inherent need for security, energy and water conservation, resource distribution, waste management, disaster management, construction, and transportation.[iii]

David Kilcullen identifies the following trends as shaping the megacity: rapid population growth, accelerating urbanization, progressively littoral development, and increasing connectedness.[iv] By definition, a megacity is an urban environment with a population of 10 million inhabitants or more. As urbanization accelerates and population increases, the US Army must prepare itself to
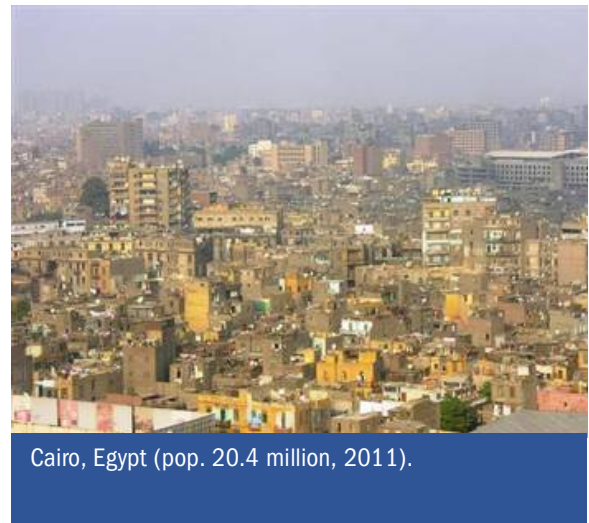
Cairo, Egypt (pop. 20.4 million, 2011).

conduct operations within the above conditions. Some analysts explain that megacities are a challenge because many "reside in states often unable or simply unwilling to manage the challenges that their vast and growing populations pose."[v] P.H. Liotta posits that, by providing extremists with potential safe havens under cover of dense populations, megacities "have become overwhelmed, dangerous, and ungovernable."[vi]

Beyond scale and security concerns, by 2030 megacities will be strategically important for the global economy because "nearly $30 trillion, or 65 percent of the global gross domestic product (GDP), will be generated by 600 cites, of which a third will exist in the developing world."[vii] Furthermore, a megacity's complexity often comes from its inability to draw upon abundant resources to "assure the reliable functioning of all the services on which the city's life depends … while natural disaster response capability is extensive in many megacities, it is often not sufficient to prevent wide-scale destruction and loss of life."[viii]

> The US Army should continue an inclusive approach to create an agile, leaner force—capable of conducting joint, expeditionary operations in response to strategic interests of the megacity.

History provides numerous instances of militaries facing challenges in the urban environment. Certainly, the US Army's own history contains several lessons learned from fighting in complex, urban terrain. However, the US Army never selects the location of a military intervention and seldom prepares itself accordingly; rather, it adapts to meet ongoing and identified future mission sets. US Joint Forces Command (JFCOM) framed this issue as a question in its 2006 experimentation: "How can we determine which concepts, materiel, tactics, techniques, and procedures are most effective for fighting in urban terrain?"[ix] Although the megacity is not the sole environment of the future in which a joint force potentially will find itself conducting operations, its characteristics of scale, complexity, and dense populations provide a vulnerable and challenging security environment, enough to warrant significant preparation.

The SSG prudently concludes that our nation's preparation for the security challenge posed by megacities should incorporate a joint and inter-agency response led by the US Army, fulfilling its Title 10 responsibilities to organize, train, and equip primarily for prompt and sustained operations on land.[x] The SSG also concludes that our "adaptability will not be enough. Now is the time for the US Army to begin the process of understanding of these places and challenging itself across Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities (DOTMLPF)."[xi]

Within a DOTMLPF framework, the US Army can create a future force capable of fighting and winning in the megacity through use of the Think–Learn–Analyze–Implement paradigm.[xii] Adjusting its Professional Military Education (PME) to increase understanding of megacity's characteristics, the US Army can strengthen its analysis of megacities and a prioritization of planning efforts. In so doing, an adjusted PME should incorporate historical observations and lessons learned to identify concepts and the most relevant technologies for the force. Additionally, the US Army must continue its war gaming efforts in developing scenarios that inform the purpose behind such interventions as well as the force organization and employment.

Some analysts, however, question the wisdom of preparing the US Army to operate in the megacity. Theorists such as Stephen Graham argue that this approach wrongfully makes megacities the target, writing that "[t]he US military and its associated complex of R&D outfits have long cherished fantasies of super weapons, which deterministically realize their dreams of mastery … and omnipotence" and warning of "technological fanaticism" deep within political and military cultures.[xiii] Recent military theorists warn the US Marine Corps about becoming too focused and that "being wed to a single form of warfare is unacceptable"[xiv] for any military institution. Still other senior strategic analysts theorize:

> … that a shift to urban operations will require an entire makeover of the service's organization, equipment and training. Urban operations will require significant investments in robots, unmanned systems, specialized communications for urban canyons, and new types of sensors, improvised explosive device defeat systems, armored vehicles, non-lethal capabilities and close combat weapons.[xv]

The US Army should adapt within the DOTMLPF framework to conduct operations across a wide spectrum of conflict and against conventional and asymmetric adversaries alike. In describing the difficulty in achieving this goal, Michael Evans recognizes that "specialists favor an approach toward urban operations in which troops are fully optimized for control of the cityscape … Generalists on the other hand adhere

to a traditional belief that military versatility remains more important that optimization for any specific environment."[xvi]

Current strategic environments and future trends warrant the US Army's actions in preparing for the megacity. Yet, how can it address megacity operations while balancing the effort against competing interests in support of national security? This paper argues that the US Army should equip and structure its force in order to operate in multiple environments and, at the same time, it should continue an inclusive approach to create an agile, leaner force capable of conducting joint, expeditionary operations in response to the strategic realities of the megacity. In this way, the US Army needs to analyze the megacity as part of its 2025 plans to determine how best to employ and structure the force. First, the US Army needs to continue analyzing the how and why military intervention may be required in the megacity. Next, using some of those determinations, it needs to develop more scenarios to consider multiple mission sets within various types of megacities. Lastly, this joint effort should pinpoint efficiencies between services in order to determine which technologies need critical development.

Thinking & Learning about the Megacity

As the US Army Chief of Staff's Strategic Study Group (SSG) explains, "[a] megacity is not the only environment where a land force can be tasked to operate, but is potentially the most challenging."[xvii] To prepare for operations within this future security environment, the US Army must institutionalize a learning effort to understand the challenge and methods of analysis to ascertain implications for the force. Additionally, given the constrained fiscal environment of the near future, the US Army must recognize the need to prioritize planning for those cities most at risk of an intervention by a future joint force. For this level of planning, the US Army must leverage and integrate joint, multinational, private sector, and academic partnerships across the defense community. The US Army must learn, understand, and analyze the megacity before transforming or equipping itself, and before thinking of winning any contest in such an environment.

Why does the US Army see the megacity as a potential security challenge? In 2014, the United Nations recorded 28 megacities with a combined population of 453 million people and estimated that number will rise to 6.5 billion people by 2050.[xviii] Rapid population increases combined with urban sprawl further destabilize regions already susceptible to becoming sanctuaries for violent non-state actors. Furthermore, the megacity environment promotes crime, disease, and potential political unrest. As Jack Goldstone observes, urbanization and youth population "bulge" found in the lower-income countries of Africa and Asia foment conditions for terrorism with "neighborhood networks, access to the Internet and digital technology … offer[ing] excellent opportunities for recruiting, maintaining, and hiding terrorist networks."[xix] Megacities and regional conurbations provide a ripe environment for lawlessness, potentially turning them into ungoverned cities.

Non-state actors can seize control of ungoverned spaces within a megacity to conduct operations. Kilcullen's competitive control theory recognizes these conditions

and holds that "in irregular conflicts, the local armed actor that given a population perceives as best able to establish a predictable, consistent, wide-spectrum normative system of control is most likely to dominate the population and its residential area."[xx] Given the difficulty of governance in a megacity, and of a city's ability to manage its population, "security is challenged by non-state actors such as terrorists, insurgents, criminals, and extremist organizations … non-state armed groups may become a governing factor in megacities."[xxi]

Mumbai, India (pop. 20.7 million, 2011).

To institutionalize its learning about their challenges, the US Army must identify megacities within the different regions that already merit planning endeavors. The US Army can ill afford to resource contingency plans for potential or actual megacities based on population size alone. In *Governing Megacities in Emerging Countries*, Dominique Lorrain examines the history, economic base, social groups, and linkages between issues in case studies of Shanghai, Mumbai, Santiago de Chile, and Capetown.[xxii] The study concludes that the size of megacities does not increase complexity and that "the most important point [is] whether or not there is a government endowed with legal authority and recognized legitimacy."[xxiii] Moreover, other studies suggested that governance matters in the "way a place is governed … the manner of governance affects the local conditions and resources that are available for illicit actors to exploit" and create conditions necessary for redress through military intervention.[xxiv]

US Army planners must leverage social, political, and economic data to identify those zones of potential conflict that contain megacities. For instance, the UN Department of Economic and Social Affairs (UNDES) World Urbanization Prospects (WUP) 2030 provides a projection of urban population growth and urban

agglomeration. It projects that more than 60% of the world's population will live in cities by 2030.[xxv] Furthermore, the latest Demographia study identifies 34 megacities, with 67% of large urban areas (500,000 and higher) located in Asia and Africa.[xxvi] The Fund for Peace (FFP) Fragile State Index is a useful, comprehensive social science methodology for identifying factors of instability,[xxvii] and FFP also integrates its proprietary Conflict Assessment System Tool (CAST) analytical platform to identify geographical areas of vulnerability.[xxviii] Combined, these tools can help predict at-risk areas that contain megacities. Data such as these will help to identify at-risk megacities and to analyze their Political, Military, Economic, Social, Information, Infrastructure, Physical Environment, and Time (PMESII-PT) characteristics.

Along with incorporating such tools to prioritize contingency planning and or scenario development, the US Army needs to develop an operational method to analyze the megacity as a unit. Bailey et al. provide an excellent strategic framework that focuses the strategic planner on the megacity's context, scale, density, connectedness, and flow.[xxix] The framework provides a means to "uncover key nuances in operational environments that are incredibly complex. It is not meant to provide a model for understanding all megacities or replace existing analytical tools," such as PMESII-PT or Area Structures Capabilities Organizations People and Events (ASCOPE, covering civil considerations during a military campaign).[xxx] Another analytical model—which includes Mission, Enemy, Terrain/Weather, Troops/Support Available, Time Available, and Civil Considerations (METT-TC)—provides a mental tool for the tactical analysis of the megacity.[xxxi] Commenting on the need to address the megacity, as a senior US Marine Corps doctrine writer has noted, "The intellectual center of gravity is open to those who choose to seize it, because it does not exist. Recent US service and NATO wargames and experiments that were supposed to address operational and tactical level conflict in the megacity [were] stillborn. There is a yawning gap."[xxxii] The US Army must fill such gaps by providing a doctrinal model for operational analysis and by incorporating educational opportunities within our existing education system.

The US Army's *Unified Quest 2014* points to the need for doctrine to describe the characteristics of the megacity and conducting operations under permissive and non-permissive conditions.[xxxiii] Set in an operating timeframe of 2030-2040, the document stresses the need to operate across multiple domains—air, surface, subsurface, human, and information (cyber)—as subsystems of the megacity that require us to understand how their characteristics affect a force

> Along with incorporating such tools to prioritize contingency planning and or scenario development, the US Army needs to develop an operational method to analyze the megacity as a unit.

operating within and in some cases across them.[xxxiv] These domains provide a logical and systemic set of variables to analyze methodically the physical, information, and human characteristics of the megacity. Moreover, both US Army and joint forces could easily incorporate these variables as a doctrinal foundation for megacity analysis.

This new understanding of the megacity should be included in the PME, with a focus on developing critical thinking skills and decision making in an ambiguous environment.[xxxv] Broadening the US Army's assignments for the megacity will require an interdisciplinary program, grounded in the sociopolitical realities of a region. As a US Army Capabilities Integration Center (ARCIC) senior leader puts it, these assignments should "include familiarization with the PMESII-PT of not only the combatant command regions, but also those megacities which serve as potential future flashpoints for future endeavors."[xxxvi] Moreover, regionally aligned forces should provide a periodic engagement team or a liaison officer to develop relationships and institutional knowledge with a city's emergency management or urban management teams. These duties develop critical relationships and increase understanding of "all the tribes and the cultures that contribute to unrest" for use by the regionally aligned command.[xxxvii]

The US Army must incorporate megacity learning into other curriculums for officers, and PME should expose officers at all stages of their career to new learning about megacities. A good example of this sort of curriculum is found at the Combat Studies Institute (CSI), which presents virtual staff rides featuring teaching moments

from operations in Fallujah and Baghdad.[xxxviii] Training via industry fellowships in the private sector will allow for collaboration with companies such as IBM, something futurist Erin Simpson suggests as IBM develops its "smart city initiative." This project involves developing "cloud [computing] for collaboration among disparate agencies. Mobile [technology] to gather data and address problems directly at the source. Social technologies for better engagement with citizens."[xxxix]

Furthermore, both Intermediate Level Education (ILE) and the School of Advanced Military Studies (SAMS) offer opportunities for the megacity to serve as a tactical or operational challenge, something that echoes the school's early framework in the interwar years.[xl] Tactics, Techniques, and Procedures (TTPs) and "observed lessons learned" tools could encourage collaboration with doctrine developers and regionally aligned forces interested in designated megacities. As one security analyst explained, the US Army must engage in urban research programs that are "interdisciplinary in theory and interagency in practice … [and] systematically integrate military concerns with relevant aspects of municipal management, urban geography, and city planning."[xli] In this way, the US Army could adopt a holistic approach to the megacity.

Analysis of Concepts for Operations Within the Megacity

At the same time as increasing its understanding of the megacity, the US Army must also develop and analyze concepts, capabilities, and technologies that best employ and equip the future force. Historical lessons, recent conflicts, and JFCOM and present US Army initiatives can help to identify common fundamental concepts for operating in a dense urban environment. These ideas should influence rapidly evolving technologies necessary to equip the force. However, with multiple mission sets and a foreseeable smaller force, the future US Army must be careful to not expend all planning energy on the megacity; rather, it should seek an efficiency by investing in those relevant technologies capable of use beyond the megacity environment.

In fact, as the US Army seeks to increase its institutional knowledge of megacities, it will find that lessons from historical urban combat experiences can help to refine the concept of operating within complex urban terrain. An ARCIC leader observes that …

> … [m]ilitary operations in a megacity are complex, dangerous, and intense. Urban terrain is the great equalizer when facing determined combatants. The megacity magnifies the power of the defender and diminishes the attacker's advantages in firepower and mobility. Thus, the United States and partner nations will face the possibility of larger entrapments.[xlii]

It should be noted that the US Army has never operated within a megacity, yet many of its past military experiences apply to the megacity environment. In *Concrete Hell: Urban Warfare from Stalingrad to Iraq*, Louis Dimarco posits that the American US Army's experience in Aachen, Seoul, Hue, and Ramadi all demonstrate that "huge numbers of infantry were not required for the fight. However, well trained infantry targeted at specific objectives linked logically to a comprehensive plan."[xliii] As well as smaller, capable formations, US Army operations in Sadr City in 2008 demonstrated that vital capabilities in the urban slums consist of persistent ISR, responsive and precise fires, rapid maneuverability, squad survivability, integration of Special

Operations Forces (SOF), decentralized mission command with shared understanding, and capable indigenous forces.[xliv]

The Israeli Defense Forces (IDF) operation in 2008 in the Gaza Strip presents a useful case study in modern day urban operations amongst a populace. Operation CAST LEAD proved successful due to IDF's improved performance over its failed 2006 Lebanon campaign, with an emphasis on integrated joint ground maneuver, precision GPS guided fires, actionable intelligence, transition from low intensity to high intensity engagements, and mitigation of collateral damage.[xlv] For instance, technology played a role in mitigating collateral damage against targeted safe houses:

> An IDF or Shin Bet intelligence officer would place a phone call to the occupants advising them that the structure was scheduled to be struck and to vacate it within ten to fifteen minutes. In some cases, the IAF also delivered a small non-fragmenting precursor munition of low yield into a corner of the roof of a targeted house as a figurative "knock on the door" warning occupants to vacate.[xlvi]

Some analysts question the success of Israel's operation in that Hamas and Hezbollah remained viable military forces and that the IDF operation "had no plan to conduct a 'hold' or 'build' phase in their operations. Without those phases, it is difficult to see what a US commander could accomplish using a template that is essentially an operational raid."[xlvii] However, given the sheer size of the megacity and the US Army's projected force structure, one questions the necessity, much less the feasibility of "holding" large portions of such a place. Given projections, the question becomes similar to this one: "The real question the US Army ought to be asking is this: if cities are strategically important, how can we influence and control them without having to go downtown?"[xlviii]

JFCOM conducted a joint experiment, Urban Resolve, from 2004 to 2006 that sought to answer the same question. However, JFCOM re-framed the questions as such:

> How can we fight in urban terrain against an intelligent, determined, well-equipped adversary and win quickly without unacceptable casualties to ourselves or our allies, unacceptable civilian casualties, or unacceptable destruction of infrastructure? ... How can we determine which

concepts, materiel, tactics, techniques, and procedures are most effective for fighting in urban terrain?[xlix]

Nearly a decade later, during the Force 2025 Maneuvers—the intellectual framework to develop interim solutions—the US Army sought answers to the same questions. The US Army's *Unified Quest 2014* war game examined how a future force "conducts unified land operations in response to an international crisis under the demands of the megacity environment."[l] *Unified Quest 2014* determined

Lagos, Nigeria (pop. 21 million, 2012).

that operations would require 1) joint air-to-ground maneuvers to gain access to and operate within the megacity; 2) smaller, dispersed units conducting operations across domains; 3) incorporation of cyber capabilities; 4) a joint headquarters construct; 5) building awareness through the regionally aligned forces; and 6) ensuring interoperability with its interagency and multinational partners.[li]

JFCOM's Urban Resolve experiments and the US Army's *Unified Quest* war game further sought to identify operational concept and capability needs for operating within complex urban terrain. Each endeavor yielded similar capability needs in "urban intelligence, surveillance, and reconnaissance (ISR), electronic warfare, information operations, precision strike, non-lethal weapons, urban logistics, support for the civilian population, and the need for coordination and cooperation across service, agency, national, and non-governmental organizations (NGO)."[lii] Consequently, the US Army's Training and Doctrine Command (TRADOC) Commanding General has envisioned a force "decentralized, distributed, integrated, regionally aligned, … [with] increased expeditionary capability."[liii] The capstone exercise identified concepts, capabilities, and technologies that merit further Force 2025 activities through additional panels, war games, and experimentation as the US Army analyzes its needs before equipping or organizing its force.

In addition, the Joint Advanced Warfighting Program (JAWP) conducted a series of war games on concepts for urban operations in 2003. Much like JFCOM's Urban Resolve experiment, the JAWP study focused on offensive operations in Baghdad, Iraq. Yet, the emerging concepts became the Department of Defense's (DoD) Roadmap for Improving Capabilities for Joint Urban Operations (JUO).[liv] The exercises yielded six concepts similar to those generated by *Unified Quest 2014*, and they could prove valuable to developing doctrinal concepts for consideration by the US Army 2025 Maneuvers.

An fundamental theme that emerges is that these concepts rely upon "continuous ISR efforts with fire delivery and ground maneuver, whether by special operations forces, or by conventional ground forces, or their combinations."[lv] The concepts include precision strike, nodal capture, nodal capture and expansion, soft-point capture and expansion, segment and isolate, and nodal isolation.[lvi] Although designed for a joint, conventional-centric force, a brief discussion of their practicality toward development of capabilities and technologies in the Force 2025 Maneuvers follows.

Precision Strike

> Precision strike involves precise indirect and direct attacks to achieve desired effects against adversary capabilities from standoff distances ... without occupying ground ... it requires precisely knowing locations of nodes of adversary forces and how they interact. The joint force commander minimizes ground force presence by using remote fires and Special Forces direct action as his primary defeat mechanisms.[lvii]

Here, as with all concepts, operations require a joint, interagency, intergovernmental, and multinational (JIIM) operational approach. Moreover, a light footprint is required with heavy reliance on leveraging existing systems in the city. Reliance on current technology within the megacity presents a challenge "since dense urban infrastructures make it difficult for US forces to fully employ long-range sensors and munitions. Moreover, civilian populations are an ever-present reminder of the need to avoid collateral damage."[lviii] Overall, a reliance on technology and "constant ISR" permeates schemes for operations within megacity.

Nodal Capture

Nodal Capture requires "leverage control of critical nodes in the city in order to deny the adversary sources of support."[lix] The concept relies upon knowledge of which "nodes are critical, how they interact, and a thorough knowledge of the adversary's defensive plan."[lx] Herein, nodes could apply to the physical, structural, and human environments, and the description serves as a precursor to current Joint Concept for Entry Operations, which addresses joint force entry to establish operations across multiple domains.[lxi] The document delineates 21 tasks required of a joint force headquarters in such an operation.[lxii]

Nodal Capture & Expansion

Nodal Capture and Expansion requires leveraging "control of the critical nodes in the city to facilitate control of rest of the city."[lxiii] Although the war game addressed a conventional force of the era, an updated concept could apply the term nodal to information and human nodes, not just a physical one. *Unified Quest 2014* concluded that in 2040, "land forces must have the ability to operate in the three realms of conflict: physical, information and human."[lxiv] In developing the concept and supporting technologies, the overarching focus should be on precise information operations that target adversarial capabilities and nodes without crippling the megacities' functions.

Soft Point Capture & Expansion

Soft Point Capture and Expansion relies on capturing "undefended areas in the city and uses them as bridgeheads for decisive multiple attacks" and requires "knowing where the adversary forces are, where they are not and how they plan to defend the city."[lxv] This approach captures the conceptual need for smaller formations capable of dispersed operations across non-contiguous areas of operation—or domains, as mentioned in the model for operational analysis discussed previously. Lastly, "expansion" extends to all domains of the megacity—air, surface, subsurface, human, and information (cyber).

Segment & Capture

Segment and capture features "countermobility to fix the adversary forces so they lose the ability to mass … efforts at re-establishing the indigenous support infrastructure or bringing in outside support can begin early."[lxvi] This concept underlines the need to strengthen transition within the JIIM community. Moreover, this concept requires an understanding of the city's capacity and normal procedures in its daily operations.

Nodal Isolation

Nodal isolation "seals critical (structural and non-structural) nodes from an adversary to deny him source of support and freedom of movement to prevent contract between adversary forces."[lxvii] In thinking beyond the physical domain, megacities place a greater demand for information operations that achieve precise effects against the adversary while allowing our networked ISR and mission command platforms to operate unhindered. Recently, TRADOC determined the need to support the intelligence function with a cloud architecture to "enable expeditionary intelligence and mission command by 2025."[lxviii] Conceptually, these approaches serve as a driver to work through war-gaming megacity scenarios.

> Operational concepts provide a foundation for the US Army to develop, adapt, and test capabilities to lead the joint force in unified land operations within the megacity. Furthermore, numerous technologies present possible solutions for developing capabilities within the megacity.

These operational concepts provide a foundation for the US Army to develop, adapt, and test capabilities to lead the joint force in unified land operations within the megacity. Furthermore, numerous technologies present possible solutions for developing capabilities within the megacity. For the purposes of this paper, we shall identify examples of cyber operations; Intelligence, Surveillance, Reconnaissance (ISR); and logistical resupply as key examples:

Cyber Operations

First is the need to operationalize cyber operations; more specifically, the "operating, defending, causing effects in cyberspace, and enable operational-level integration …"[lxix]

Operations within the megacity will require truly refining the capability to assist a joint land force in precisely targeting a city's virtual and physical infrastructure without potentially paralyzing an entire populace or global hub of commerce.

Intelligence, Surveillance, Reconnaissance (ISR) Platforms

No ISR platform is perfect, but megacities demand improved platforms. The megacity will require rapid sharing of information over dispersed formations and platforms capable of maneuvering within and providing near-real-time intelligence in the megacity. The Intelligence Center of Excellence (COE) acknowledges that the complexity of the operational environment requires adapting and innovating "intelligence support capabilities to accurately describe the problem and environment, and correctly identify challenges and gaps in order to clearly define DOTMLPF-P capability solution sets."[lxx]

Logistics

Sustainment capabilities require innovations—such as the Inbound, Controlled, Air-Releasable, Unrecoverable Systems (ICARUS)—with proven technology to support a scenario in which "troops are called upon to deliver food, perishable vaccines, insulin, and blood and plasma products to widespread, difficult-to-reach destinations in the aftermath of an earthquake or tsunami."[lxxi] In addition, mission command demands technology capable of maintaining access to space, especially "high-altitude technologies to augment communications and navigation, and timing … in large urban environments."[lxxii] As a senior strategic analyst summarized, the US Army needs "to blend police, infantry and military special forces" functions, and this analyst identifies a range of other requirements: "highly granular intelligence collection, knowledge management and … rapid networking, partnership building and innovation."[lxxiii] The current set of *US Army Warfighting Challenges* (AWC) addresses these megacity challenges in its 20 identified first order problems for the future force.[lxxiv] All of these challenges will prove worthy of incorporation into future war games.

Analysis & Implications for US Army Maneuvers 2025

Demographic trends of urbanization, climate change, and declining resources increase the likelihood that the US Army will operate in complex urban terrain such as a megacity. The effort to prepare must understand how a joint force becomes involved in a megacity and the implications of such involvement. Guidance found

A fire consumes a favela in Sao Paulo, Brasil (pop. 20.9 million, 2014).

in *Sustaining US Global Leadership: Priorities for 21st Century Defense* states that whenever possible "we will develop innovative, low-cost, and small-footprint approaches to achieve our security objectives, relying on exercises, rotational presence, and advisory capabilities … however, US forces will no longer be sized to conduct large-scale, prolonged stability operations."[lxxv] This guidance implies joint, expeditionary, and limited-duration operations for the future.

In addition, the US Army should examine deterrence and preventative activities via forward-based regionally aligned forces. Typically, militaries must intervene when the megacity as a "system," as Kilcullen describes it, is overwhelmed.[lxxvi] Davidson identifies part of the system as civilian agencies, and she identifies the 2011 Japanese tsunami and Hurricane Katrina (2005) that struck New Orleans as "challenges beyond the capacity of local law enforcement or first responders."[lxxvii] Whether its contending with natural disasters or radicalized terrorist groups, regional aligned commands must consider at-risk megacities as a focus for theater security engagement. These engagements will promote the establishing of relationships needed to respond to an

emergency or to build cooperation within the JIIM community in support of military action.

In the future the US Army will need to develop additional megacity scenarios to validate employing and structuring its force. Canton proposes a spectrum of four types of megacity: "chaos city, fortress city, gang city, and smart city."[lxxviii] "Chaos" cities represent "failed state[s] in the Middle East and Africa, where warring political groups and conflict are the daily experience."[lxxix] The opposite end of the spectrum is the "smart city," which is a city that uses advanced technologies in "computing,

> Canton proposes a spectrum of four types of megacity: "chaos city, fortress city, gang city, and smart city."

neuroscience, nanoscience, and information science to address challenges of the future city such as energy, health, safety, and commerce."[lxxx] In essence, the smart city is a futuristic environment where projected and imagined technologies run its systems. This spectrum can help to build upon the SSG's strategic framework to test a joint force that operates at various levels of the megacity spectrum—cities that are "loosely, moderately and highly integrated"—and that uses the strategic variables of "context, scale, density, connectedness, and flow."[lxxxi] Furthermore, planners should review JFCOM's *Unified Quest 2004* reports that combined a humanitarian mission while countering weapons of mass destruction (WMD) within a city.[lxxxii] This set of scenarios provides a palette of distinguishable, potential urbanized operational environments.

Future scenarios need to address a range of potential missions in the megacity. For instance, the *Unified Quest 2014* study involved the JIIM community in an exercise in which a notional regional power faced a devastating flood that killed nearly 500,000, displaced millions, and involved a "host nation request for security forces to lead coalition operations aimed at supporting their government and managing international humanitarian assistance."[lxxxiii] Metz identified five scenarios that provide strategic and operational challenges for future wargames: proximity danger, countering a direct threat, countering a threat to an ally, a conventional war, and a humanitarian relief scenario.[lxxxiv] *Unified Quest 2014* provided useful insights and implications regarding the

megacity; however, one can identify many different megacity disaster scenarios, strategic locations, and/or mission variables that would need alternative plans, not to mention a unified joint effort in regard to the large urban theater—imagine an earthquake overwhelming Mexico City, terrorists wielding a nuclear device in Lagos, or an joint command trying to secure the difficult littoral environs of Mumbai.

Creating additional megacity operational scenarios will allow the US Army to generate efficiencies among the joint force and to validate concepts that shape and/or equip the force. Firstly, a review of *US Army Doctrine Field Manual 3-06 Urban Operations* should account for operating in large urban areas such as the megacity, include updated joint urban operating concepts, and place an overall emphasis on the physical domain rather than the informational and/or human.[lxxxv] Land forces such as the Army, Marines, and associated SOF could improve their interoperability and efficiency. Both the US Army and the SOF, for instance, benefit from DARPA projects undergoing Marine testing. These experimental platforms include the Autonomous Aerial Cargo/Utility System (AACUS) or the Aerial Reconfigurable Embedded System (ARES) that conduct expeditionary resupply.[lxxxvi]

Lastly, developing various scenarios will give the US Army an opportunity to structure its force to help shape megacity operations. Some have proposed the creation of Urban Engagement Teams (UET) to "engage in a comprehensive understanding of the environment prior to the arrival of forces. Unlike a traditional urban environment, the megacity environment is a threat in and of itself."[lxxxvii] Certainly, the megacity presents a challenging operational environment; however, the US Army must focus its efforts on creating a force structure that addresses all future potentialities, not solely megacity operations. Preparation for the future will require a generalist approach. However, the purpose of a UET remains valid. Perhaps a Military Intelligence Brigade could serve in this capacity by calling upon its regional expertise.[lxxxviii] Although the Army and Marines both continue separate analysis of the megacity, there is clear opportunity to improve efficiency through a unified effort, led by the Army.

Recommendations & Conclusion

Whereas the US Army must prepare itself for all future land-force operations, not just the megacity, and whereas megacity preparations should not consume all the US Army's planning efforts, nevertheless the US military must continue to support national strategic goals through action that deters or compels our enemies and that provides options to the national command authority. LTG McMaster identifies the "RSVP fallacy," the misinformed belief that a nation can opt "out of armed conflict, such as fighting on land … if Western militaries do not possess ready joint forces operating in sufficient scale and in ample duration to win." In this situation, "adversaries are likely to become emboldened, and deterrence is likely to fail."[lxxxix] Steven Metz best summarizes the strategic vulnerability of failing to prepare for megacity operations:

> Failing to prepare for military operations in dangerous megacities could leave a future president without the means to do something that he or she considers to be in the national interest. While it might be easy for today's leaders to devote the shrinking defense budget to other things, they must remain aware that the capabilities they begin to develop today will define what is strategically feasible in the future.[xc]

Therefore, the US Army must address megacity operations regardless of how challenging these scenarios are to current force structure and capability.

The megacity presents a formidable obstacle to future joint force land operations. In addition to sheer size, megacities represent a potential strategic vulnerability to our nation's interests. Failure to equip, organize, or train the force to conduct operations within these complex urban environments will yields the advantage to future adversaries. The US Army must balance current operational demands against future requirements to lead a joint, expeditionary team in short, decisive actions against a wide spectrum of state and or non-state adversaries.[xci] Megacities therefore represent a potential operational environment for Force 2025 and beyond.

> The US Army must address megacity operations regardless of how challenging these scenarios are to current force structure and capability.

Moreover, the US Army must think, learn, and analyze before implementing any changes for its force. Within this paradigm, the US Army must implement DOTMLPF decisions based on a generalist approach using the full complement of missions and environments—not just the megacity. By leveraging academic research and demographic trends, the US Army can start identifying, analyzing, and planning for operations in the megacities most likely at risk for military intervention. Then the US Army must leverage the JIIM community, private sector, and academia to educate soldiers to not only understand how to operate in the megacity but also to think critically about deterring non-state and state-sponsored adversaries that believe the megacity is their sanctuary. Furthermore, soldiers must critically examine how the US Army might lead a joint force to leverage a megacity's unique characteristics to achieve decisive results against non-state actors—all while ensuring the operation is precise and does not disrupt the city's services or strategic importance to a region.

The US Army must recognize the megacity is one problem of many for consideration by Force 2025 and therefore it should lead a concerted joint effort to build efficiencies among the services. Historical experience and recent actions, combined with ongoing innovation and future exercises, will help to focus the US Army on those critical capabilities and technologies. A continued JIIM approach, led by the US Army, will ensure a joint focus on the conduct of mission command and will warrant interoperability between ground and air platforms for the entire joint

Seoul, South Korea (pop. 25.6 million, 2010).

force. For example, ARCIC determined the need for the US Army to "advocate for ground systems synchronized with Air Force and other acquisition systems."[xcii] The US Army's effort therefore must prioritize technologies capable of inter-organizational and multinational interoperability.

Lastly, the US Army must continue its war-gaming efforts to develop scenarios that test operational concepts in the unique environments identified in at-risk megacities. War-gaming these complex scenarios will inform future panels, experiments, and technology development for Force 2025 maneuvers. The involvement of the JIIM community is paramount in order to consistently challenge the purpose and explain the implications behind megacity operations. Therefore, future scenarios should shape operations to promote stability within the megacity and its environs. As such, Theater Security Assistance (TSA) could apply to the megacity through regionally aligned forces. Another force structure to consider is the Train, Advise, and Assist (TAA) Brigade, a viable entity for stabilizing the megacity. It is entirely possible that such an entity could form within the US Army Reserve. This kind of unit could prove invaluable in terms of developing local capacity and/or solutions for megacity security with a city/military partnership. Finally, the US Army must challenge its assumptions about the strategic importance of those megacities that are vulnerable to military intervention. Given the sheer size, population growth, strategic, and/or economic importance to their regions, the US Army must integrate political policy within its operational purpose and goals while planning megacity operations.

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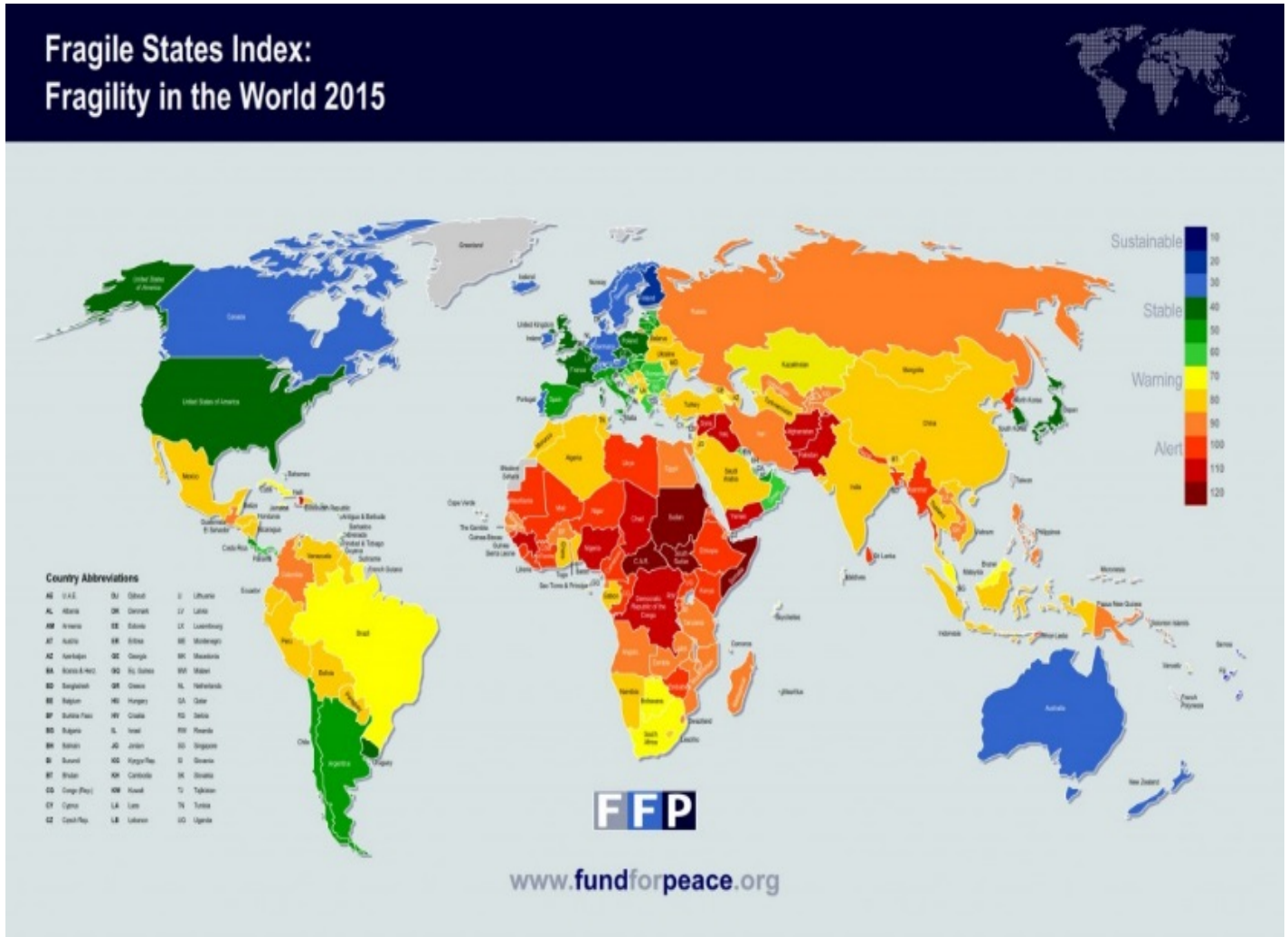
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Appendices

http://fsi.fundforpeace.org/

Percentage urban

- 80-100%
- 60-80%
- 40-60%
- 20-40%
- 0-20%
- No data

City population

- 10 million or more
- 5 million to 10 million
- 1 million to 5 million

Data source: World urbanization Prospects: The 2014 Revision
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan.
The final status of Jammu and Kashmir has not yet been agreed upon by the parties.
Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.

http://esa.un.org/unpd/wup/Maps/CityDistribution/CityPopulation/CityPop.aspx

Distribution: Large Urban Area Population
BY CONTINENT: 500,000 & OVER

Asia 56.6%
Europe 10.2%
North America 12.9%
Oceania 1.4%
South America 8.1%
Africa 10.7%

Figure 1
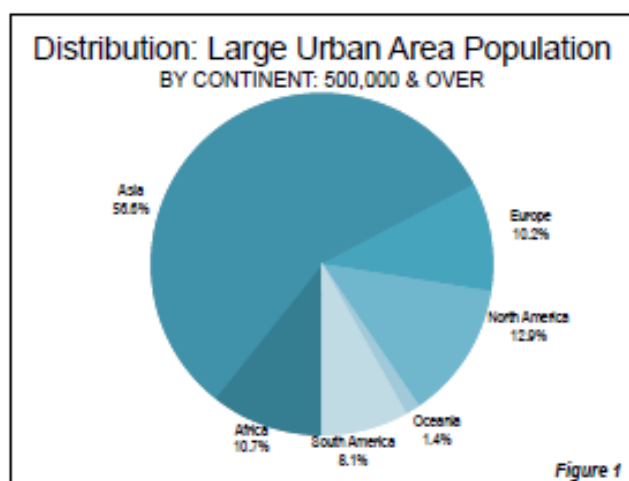
Table 1
LARGEST URBAN AREAS IN THE WORLD

Urban Areas 500,000 & Over Population

Rank	Geography	Urban Area	Population Estimate	Year	Base Year Population Estimate	Land Area: Square Miles
1	Japan	Tokyo-Yokohama	37,843,000	2015	37,180,000	3,300
2	Indonesia	Jakarta	30,539,000	2015	27,360,000	1,245
3	India	Delhi, DL-UP-HR	24,998,000	2015	22,250,000	800
4	Philippines	Manila	24,123,000	2015	20,750,000	610
5	South Korea	Seoul-Incheon	23,480,000	2015	22,580,000	875
6	China	Shanghai, SHG-JS-ZJ	23,416,000	2015	22,005,000	1,475
7	Pakistan	Karachi	22,123,000	2015	19,530,000	365
8	China	Beijing, BJ	21,009,000	2015	19,060,000	1,475
9	United States	New York, NY-NJ-CT	20,630,000	2015	20,366,000	4,495
10	China	Guangzhou Foshan, GD	20,597,000	2015	16,460,000	1,325
11	Brazil	Sao Paulo	20,365,000	2015	19,260,000	1,045
12	Mexico	Mexico City	20,063,000	2015	19,250,000	800
13	India	Mumbai, MH	17,712,000	2015	16,680,000	211
14	Japan	Osaka-Kobe-Kyoto	17,444,000	2015	17,000,000	1,240
15	Russia	Moscow	16,170,000	2015	15,560,000	1,800
16	Bangladesh	Dhaka	15,669,000	2015	13,680,000	139
17	Egypt	Cairo	15,600,000	2015	15,680,000	680
18	United States	Los Angeles, CA	15,058,000	2015	14,667,000	2,432
19	Thailand	Bangkok	14,998,000	2015	13,580,000	1,000
20	India	Kolkata, WB	14,667,000	2015	14,113,000	465
21	Argentina	Buenos Aires	14,122,000	2015	13,370,000	1,035
22	Iran	Tehran	13,532,000	2015	13,080,000	575
23	Turkey	Istanbul	13,287,000	2015	12,400,000	525
24	Nigeria	Lagos	13,123,000	2015	13,123,000	350
25	China	Shenzhen, GD	12,084,000	2015	11,580,000	675
26	Brazil	Rio de Janeiro	11,727,000	2015	11,300,000	780
27	Congo (Dem. Rep.)	Kinshasa	11,587,000	2015	11,587,000	225
28	China	Tianjin, TJ	10,920,000	2015	10,275,000	775
29	France	Paris	10,858,000	2015	10,460,000	1,098
30	Peru	Lima	10,750,000	2015	10,750,000	355
31	China	Chengdu, SC	10,376,000	2015	8,750,000	595
32	United Kingdom	London	10,236,000	2015	9,787,000	671
33	Japan	Nagoya	10,177,000	2015	10,080,000	1,500
34	Pakistan	Lahore	10,052,000	2015	8,675,000	305
35	India	Bangalore, KA	9,807,000	2015	8,490,000	450

Demographia World Urban Areas: 11th Annual Edition: 2015.01 (Built-Up Urban Areas or World Agglomerations)

http://www.demographia.com/db-worldua.pdf

Current Army Operating concept that shows "How to Win in a Complex World" (TP 525-3-1). The slide illustrates operational challenges of the megacity that demand a joint, agile force capable of conducting sustained operations across multiple domains and dispersed locations, while maintaining a smaller footprint, and achieving precise effects within the megacity—all while not disrupting its operations and coordinating actions with the Joint Interagency, Intergovernmental, Multinational Community.

http://asc.army.mil/web/access-win-in-a-complex-world-but-how/

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