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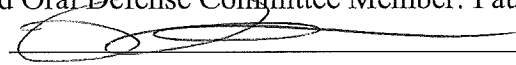
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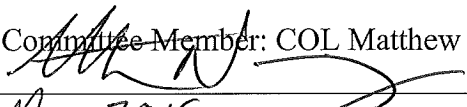
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Executive Summary

Title: Preventing the MDCOA: *The Army's Need to Organize, Train, and Equip for a Megacity Conflict*

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Thesis: Conducting military operations within a megacity is an immediate problem set facing the United States Army, and in order to fight and win in this new environment, the Army must critically review and implement the requisite changes to its organization, training and materiel.

Discussion: From Aachen, Germany to Hue City in Vietnam and in Baghdad, Iraq, the U.S. Army maintains a robust history of conducting military operations in urban environments. A recent example is the 2016-2017 nine-month battle for Mosul, which is the U.S. Army's largest sustained urban operation since 1968 in Hue City, Vietnam. Following the success of Operation EAGLE STRIKE (Battle for Mosul) the U.S. Army dissected and analyzed the challenges of conducting intensive, sustained, urban operations. The Army concluded that the coalition forces overmatch, specifically concerning command and control, communications, targeting, and air-power, coupled with continual adaptation, were the decisive factor in victory in the fight for Mosul. However, the propensity for similar challenges within urban environments will continue unless the Army enacts immediate change in preparation for urban operations in the 21st Century. Although successful, Operation EAGLE STRIKE in Mosul did more than liberate a city, it revealed a leviathan of a problem set for the U.S. Army, conducting military operations within a megacity.

Conclusion: Future operations inside megacities may not replicate the years of conducting counter-insurgency operations, instead may be focused on humanitarian relief, Defense Support to Civil Authority missions at home (post natural disaster i.e.-Hurricane Sandy), or in support of combat operations overseas as part of a joint force.¹ The United States Army must adapt now across Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities and Policy (DOTMLPF-P) in order to meet the challenges presented with conducting urban operations within megacities. The Army must implement immediate changes and prepare now for the megacity fight. Through the organization, the Army must develop a specialized megacity force which is regionally aligned within a COCOM with specific focus on the megacities within that COCOM's AO. The forces should be developed at the Brigade size and deployed to conduct operations as company teams. This provides greater flexibility to the megacity commander and further provides the COMCOM Commander with the capabilities and capacity required to conduct operations throughout their AO, not just one megacity. Next, the Army must train this newly organized force. It must develop a state-of-the-art megacity training facility, which can either be accomplished through building upon the current MOUT sites within the Army's inventory, or constructing a brand-new site from the ground up. This facility must replicate, as close as physically possible, an active megacity. Replication of infrastructure, public transportation systems, subterranean networks, electromagnetic spectrum signals, and a dense population. This equipment update and fielding must cover the shoot, move and communicate spectrum. The megacity force must field a new inventory of weapons aimed at reducing

collateral damage to both civilians and infrastructure. This means fielding variable optic long-range rifles for precision firing, restricting munitions types and usage areas for indirect fires, and utilizing strictly precision-guided munitions from close air support. Sun Tzu adage of “never attack a fortress” is applicable in both the 6th Century and even more true today in the 21st Century. The creation of a megacity force is decisive for the Army in the prevention of a large-scale megacity kinetic conflict, but if this becomes inevitable, the Army will be better prepared. This force must focus on attacking a portion of a megacity to achieve a limited objective, and it is incumbent upon the Army, as a member of the joint force, to be prepared to fight and win in an extremely complex environment.

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Preface

My interest in megacity conflict began in April 2018 while attending the United States Army's Strategic Broadening Seminar on Dense Urban Terrain/Megacity Conflict. This two-week seminar explicated the problem set facing the United States Army in conducting military operations within a megacity and challenged the participants to solve complex problems within a dense urban area. The setting of the course, New York City, a megacity itself, was decisive in achieving the goal of educating future Army leaders on the challenges of conducting military operations within this environment by conducting terrain association walks through the city and witnessing first-hand the level of complexities involved. The end state of the course was to encourage more professional curiosity and individual study into this emerging concept. This paper is my own individual attempt at furthering the discussion on megacity battle, and my recommendations on how the Army must tailor their approach in preparation.

I would like to thank everyone who supported me with this endeavor as it has become an ever-evolving product. I would first like to thank all of the professors, instructors, first responders and other agencies involved in the Megacity Strategic Broadening Seminar, especially the members of the Institute of Defense and Business. Without the seminar, my passion for this topic vis a vi this paper would simply not exist. Next, I wish to thank my brothers in arms at the Asymmetric Warfare Group who have provided me countless pages of published material for reference, after action reports, and ideas for further research. Their studies and research began the conversation within the Army on this topic and I hope to continue it. They served as my sounding board for my "great ideas" and have spent time fielding my endless supply of questions and theories. Next, my MMS mentor Dr. Paul Gelpi deserves recognition for your support and enthusiasm of this undertaking. Your counsel always provided me a well needed azimuth check and an occasional dose of reality. You also deserve special recognition for having to deal with two Major D'Ereditas this year. Finally, a special thank you to my wife Jaime, who's unwavering support of my ambitions and ideas for this project were paramount in its genesis. I am extremely grateful for your unconditional love and the motivation you provided to pursue this goal.

Introduction

From Aachen, Germany to Hue City in Vietnam and in Baghdad, Iraq, the United States Army maintains a robust history of conducting military operations in urban environments. A recent example is the 2016-2017 nine-month battle for Mosul, named Operation EAGLE STRIKE), the Army's largest sustained urban operation since 1968 in Hue City, Vietnam. Following the success of Operation EAGLE STRIKE the Army dissected and analyzed the challenges of conducting intensive, sustained, urban operations. The Army concluded that the coalition forces overmatch, specifically concerning command and control, communications, targeting, and air-power, coupled with continual adaptation, were the decisive factor in victory in the fight for Mosul. However, the propensity for similar challenges within urban environments will continue unless the Army enacts immediate changes in preparations for urban operations in the 21st Century. The Mosul study group report states:

An urban environment is alive, it changes and adapts. To operate effectively in this environment requires a more robust focus on dense urban terrain in professional military education and training. Extensive and unceasing operational preparation of the environment, intelligence preparation of the battlefield, and running estimates are essential to understand this ever-changing complex terrain.²

Although successful, Operation EAGLE STRIKE in Mosul did more than liberate a city, it revealed a leviathan of a problem set for the U.S. Army, conducting military operations within a megacity. These challenges have the potential to lead to military failure and catastrophic collateral damage without some necessary and immediate changes to its approach in preparing for this encounter.

A megacity is a densely populated urbanized center with a population of ten or more million inhabitants. In 1950 there were two cities that fit the definition of a Megacity, New York and Tokyo; in 1990 there were ten, and by the time the Army conducted the Strategic Studies

Group (SSG) 2014 megacity study that number rose to twenty-three.³ Megacities present an opportunistic environment for both conventional adversaries and non-state actors to operate in and from. In terms of planning and preparation, the megacity is the operational environment that currently poses the greatest challenge to the Army.

The mission variable complexities (ASCOPE PMESSI-PT) and planning considerations necessary for a Defense Support of Civil Authorities operation within New York City, or a counter-insurgency operation as a member of a joint team within cities like Lagos, Nigeria or Rio de Janeiro, Brazil, must be unpacked and analyzed prior to first contact. Failure to organize, train and equip in preparation for a megacity operation will lead to an engagement on the adversary's terms. These steep learning curves must be understood and accounted for now, rather than "adapted to" as conflict emerges. This must take place with partnered, regionally aligned megacity forces who are the subject matter experts within their region and can provide a timely and detailed analysis to the combatant commander to assist with decision making.

The Army must dedicate personnel and resources now to meet this challenging new operational environment. The approach of planning to avoid urban combat within a megacity is wishful thinking and ultimately will be proven as impossible to avoid. The effects of Hurricane Sandy in 2012 in New York City provided a domestic example of military forces operating within a megacity to provide disaster relief support and defense support to civil authorities. These stability operations were small in scale, but the challenges faced were new for the responding forces and provided lessons learned for a future force within a megacity.

The magnified complexities within a megacity serve as an example as to why the Army has not placed as much emphasis, relative to other priorities; such as Security Force Assistance Brigades, on preparations for this environment, as the problem set is extremely complex and

ever-evolving. Operating in a passive megacity is undoubtedly challenging, but conducting an operation in a denied/degraded environment against an adversary or non-state actor, the security challenges becomes even more complex. To say the challenges facing the U.S. Army in planning for this type of fight are overwhelming is an understatement. The Army officially recognized this existential threat with the Strategic Studies Group case study of megacities, but since then, has conducted limited studies and doctrinal research in an effort to solve the questions and attack the way forward posed in the study.⁴ A majority of the research and studies since the SSG in 2014 are limited in size and scope and are mostly conducted independently by Soldiers enrolled in a Professional Military Education school, personal blogs, or sponsored research with a limited scope.

The SSG work is now five years old and in that time the city landscapes, number of megacities, technology, and many other variables have changed significantly, while the Army's preparations have remained relatively unchanged. The SSG concludes that "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, Facilities and Policy (DOTMLPF-P).⁵ This future battlefield demands a wholesale review of the Army across the DOTMLPF-P, and critical to effect immediate change decisive to winning in megacities are the Organization, Training and Material. Conducting military operations within a megacity is an immediate and existential problem set facing the United States Army, and in order to fight and win in this new environment, the Army must critically review and implement the requisite changes to its organization, training and materiel.

The complexity of planning, resourcing and conducting military operations in a megacity covers every domain of warfare in a magnitude never before seen by our Soldiers on the

battlefield, and in order to win, the Army must fulfill its Title 10 responsibility to organize, train and equip its forces to conduct the full range of military operations within a megacity. Although the concept of conducting land-based military operations in a megacity presents a significant challenge to the Army as the nation's premier land force, it can be effectively solved piecemeal.

If the Army does not adapt now and make the requisite changes in preparation of its force for military operations within a megacity, an adversary will dictate the terms of conflict and the Army will become engaged in operations within a megacity environment, ill-equipped and unprepared.

Megacity Defined

The emergence of megacities began post World War II with the migrations of populations from rural areas in a central zone, or non-coastal area, toward an established city along a coastline or near a major port. These massive population migrations over time were due to the jobs and financial opportunities within cities located in these coastal regions. These areas progressively became more densely populated at a rate not congruent with the industrialization of the current city in terms of infrastructure, housing, and services to meet the emerging demands of an ever-increasing population.

There are currently thirty-three cities in the world that fall into the megacity category, and with the swelling urban population from a skewed birth-to-death rates in urban, combined with increasing rural-urban migration, the number of cities with populations over ten million or more will continue to grow each year. The UN Department of Economic and Social Affairs predicts that by 2030 the world will be home to forty-three or more megacities.⁶ As the number of megacities continues to grow, it is apparent that a future conflict will involve operating in or around a megacity or the surrounding urban sprawl.

The emergence of megacities through the overwhelming population migrations to pre-existing cities with now overburdened social and essential services, coupled with pockets of ungoverned spaces, creates an ideal operating environment for an adversary to exploit the populace, disguise themselves within it and operate freely.

Security Challenges

Military 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.⁷

The overall size and population densities within megacities contribute to the creation and existence of ungoverned spaces, areas where sanctioned security forces and local governance has limited to no presence. This lack of local governance and security creates a power vacuum which can then be filled by local gangs, organized crime, non-state actors, or more commonly, self-defense militias, and create an urban microhabitat. These organizations provide local security and governance to the population by filling the power void and becoming a parallel power to the legitimate government. Once established, these organizations supplant the role of local police and governance and provide security and services to the members of their population. However, this protection and governance provided is not free. It is usually through persuasive and/or coercive means, establishing a quid-pro-quo within the community; i.e.- providing protection or paving roads in return for an enforced community tax.

These organizations seize and retain their power through a control system called competitive control. David Kilcullen's competitive control theory asserts that nonstate armed groups generate power and control through their ability to manipulate and mobilize populations. They can achieve this through coercion, persuasion and creating a normative system that

provides a false sense of security through the order and predictability it creates. Kilcullen states, “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.”⁸ Despite the coercion and violent tactics used in achieving this competitive control, the populations still respond to the predictable, ordered, and relative safety of the normative system.⁹

In order to achieve military objectives within this type of system, the facets of competitive control must be accounted for in planning, targeted through information operations, and if necessary, degraded and delegitimized through the building of capacity of local governance and host nation security forces. As military operations within a megacity become inevitable, so too will these micro habits with normative systems ruled through competitive control.

As the population within the microhabitat grows, so too does its borders, which then encroaches upon areas with an established security presence and a legitimate government system. This expansion of both power and size multiplies the effect of these drivers of instability and creates conditions that ultimately leads to armed conflict between the nonstate armed groups and the legitimate government and security forces.¹⁰ The resulting conflict within a megacity, connected via a global system, can dominate a region, delegitimize a government, and ultimately lead to a failed state.

This competitive control theory and the resulting armed conflict is not a new concept to the Army, however, it has yet to occur within the borders of a megacity. This security challenge multiplies exponentially when combined with the vast system of public transportation, high rise buildings, restrictive road networks, complex digital network and communication systems, and

rapidly moving populations. This problem set quickly becomes both overwhelming and undeniable that at some point in the near future, the United States Army will be asked to conduct military operations within a megacity. These operations could range from Foreign Disaster Relief to multi-domain battle, and the megacity force must be adaptable and tailorable to the type of operation.

General Townsend, the US Army TRADOC Commander, while speaking during LANPAC 2018 stated “I think the enemy has watched Mosul. I think they will deliberately go to the cities and dig in there to fight because they know it takes away a lot of our technological advantages...the rage of our weapons is degraded—the effects of our weapons are degraded.”¹¹ This statement represents the enemy’s MDOCA in a megacity and without a specialized force focused on preventing this type of engagement, can lead to full scale urban warfare by conventionally trained Army units which will produce unimaginable amounts of collateral damage. This can be prevented by the Army with the creation of a properly trained, equipped and regionally aligned megacity force.

The Army recognizes this security challenge, and holds conferences and studies the problem of preparing for a megacity battle, however, the proper steps toward effective preparation have not been taken. The Army needs to organize, train and equip a megacity force now for this eventuality, or the battle inside the megacity will be on an adversary’s terms.

Organization

“If I’m not able to make that shift, from the legacy to the future, we risk losing the first fight of the next war.” – Secretary of the Army Mark Esper

The Army’s present organization is not currently suited to conduct operations in a megacity. Currently, the Army is organized for operations against unconventional adversaries

such as violent extremist organizations as well as conventional near-peer competition, such as Russia or China. Both the Asymmetric Warfare Group and the Strategic Studies Group, in their respective published works, support the creation of an organization within the Army that focuses specifically military operations in megacities.¹² The Army currently possesses specialized units defined by their capability such as airborne, air assault, special forces, and the Ranger Regiment. The Army's recent creation of the Security Forces Assistance Brigades (SFAB) also points toward a willingness on the part of the Army to create an organization with a specific focus and supporting capability to tackle an emerging problem set. The fielding of an organization capable of operations within megacities would be no different, however, instead of being garrisoned stateside, these units would be permanently stationed within their geographic combatant command. While serving as the 38th Chief of Staff of the Army, General Raymond Odierno stated:

The regionally aligned forces initiative provides the Army greater flexibility and capability to create regional understanding and establish relationships with partners in these regions. Not just providing forces for a fight, but rather providing knowledgeable leaders with the background, context and cultural understanding of the AO they will be operating in. This capability is critical to winning a fight in an urban area.¹³

This sentiment rings true and supports the formation of a regionally aligned megacity force. In addition to the skill set advertised by GEN Odierno, this megacity organization would also possess the knowledge and training to conduct the full range of military operations within a megacity. Having a trained, and regionally aligned megacity force would provide a deterrent to adversaries in the region, as well as posturing a rapidly deployable force capable of multi-domain operations. This force provides the Geographical Combatant Commander (GCC) or Joint Force Commander the subject matter expertise needed, as well as the capability and capacity to fight and win in a megacity environment.

The Army has experience in this type of organization in its creation of the Embedded Training Teams (ETT) and Mobile Training Teams (MTT) during Operations IRAQI FREEDOM and ENDURING FREEDOM. These training teams were small in scale, regionally aligned and charged with partnering with local governance or policing agencies in order to achieve limited objects. However, the teams were usually not very well trained, and the MTT/ETT members were not permanently assigned as a group, which led to a lack of cohesion and effectiveness. The megacity construct would take the foundational organizational idea of the MTT/ETT and expand it to meet the demands of a dense urban area. The development of MTT/ETT oriented specifically on counterinsurgency operations and Security Force Assistance, whereas the megacity force will be agile enough to conduct the full range of military operations focused on prevention, to achieve limited objectives, or act as the subject matter expert to the GCC within a megacity.

The Army's planning for megacities must not be akin to Clausewitz' definition of absolute war; rather more Hart of Sun Tzu like with an indirect or limited war approach. This type of limited operation requires the use of a scalable force to achieve these limited objectives. Unlike the battle for Fallujah, divisions and brigades will not be positioned on line providing supporting fires for a ground force to clear house by house, block by block. Rather, the megacity force will rely on accurate intelligence, within a coherent operational framework, in concert with local governing/policing forces or agencies to achieve limited objectives. According to the Mosul Study Group, establishing limited objectives and maintaining them through mission command becomes decisive in the urban environment. Within a megacity the traditional deep, close and real operational framework become ambiguous and confusing, which therefore can lead to a ground force commander overstretching his unit within a specific zone or across a

domain. To avoid this, the commander must have a shared vision of the operational framework of the megacity, which can only come from specialized training through sets and reps, not on the job training.

The important difference between this proposed megacity force and the current components of the U.S. Army Special Operations Command is that the megacity force will be specifically regionally aligned and trained to conduct security cooperation operations with the current government/police/military forces that are responsible for the protection and defense of that megacity. Where the Ranger Regiment typically conducts direct action unilateral raids with limited objectives, and the Special Forces units deploy 12-man teams charged with training and advising smaller forces and building capacity and capability; the megacity force will be capable of operating cohesively with partnered forces, through a security cooperation agreement, within a megacity. They will accomplish this through their specific training on the culture, governance, language, geography, which will lead to the decisive coherent common operational framework.

Finally, this force should be augmented with an enabler package capable of providing access to and freedom of maneuver across all domains within a megacity. The Army's Asymmetric Warfare Group is currently fielding and testing a Multi-Domain Task Force (MDTF) which can accommodate this need. The mission of this force is to protect friendly forces and critical nodes, and strike critical enemy assets with multi-domain fires to support the JTF Commander's strategic objectives. The MDTF integrates organic and joint counter-air, counterfire, anti-ship, cyber, and space capabilities to ensure Joint Force freedom of action. Currently, the idea for the MDTF is essentially a "bolt-on" enabler to deploying units.¹⁴ The permanent addition of an MDTF to a megacity force is essential in providing the access and freedom of multi-domain maneuver to the megacity force.

The megacity unit, utilizing a brigade construct similar to the SFAB, should be organized and regionally aligned within a COCOM at the brigade level. These megacity brigades can then regionally deploy their forces as company teams. This allows for decentralized operations within a megacity and provides flexibility to the brigade commander to deploy megacity teams in multiple areas to achieve the COCOM or JTF commander's objectives. These company teams must be partnered with their assigned local/regional agency and conduct operations bilaterally. The limited size of these company teams will reduce the size and scope of collateral damage based on their footprint, not invoke an overwhelming sense of fear of occupation of a populace, as well as not disrupting daily patterns of life within the megacity.

The prevention of collateral damage and civilian casualties is key to the megacity force's success. The ruin of a city generates a displaced and now hostile population, which can lead to future threats. As seen in Raqqa, Syria, eighty percent of the buildings have been destroyed and the damage to infrastructure and the resulting effects on the population can lead to abandoned cities with no hope of recovery. The avoidance of severe collateral damage like this must be a core value of the megacity organization.

As the megacity force begins achieving its objectives, the adversary will attempt to implement its most deadly course of action, drawing the megacity force into a conventional fight while utilizing the city as a fortress. Avoiding this type of engagement is the megacity force's measure of success and the organization of its formation, leader centric with regional and combat advisor experience, will become essential in achieving this success. This type of conflict can and must be avoided by utilizing all assets and enablers at the megacity force's disposal. In the eventuality this proves impossible, and the objectives of the mission become too great to surrender, the force must prepare for a full-scale megacity battle. The megacity force then

becomes the regional experts assigned to the CJTF/JIATF/JTF and now are deployed as “bolt-on” advisory teams to conventional units.

These company teams will possess the equipment and training detailed below, as well as having the partnerships established with the policing and governing forces in their assigned region as well as the COCOM for which they are assigned.¹⁵

Training

To win in a complex world, leaders work to enhance training realism in every training event. Leaders ensure that units and Soldiers train to attain more than technical and tactical proficiency. Realism involves robustly representing the complexities of variables in an operational environment as well as their posed physical mental, and ethical challenges.¹⁶

The Army’s current “urban operations” training programs and facilities, as well as the supporting doctrine are insufficient for operations in megacities. While this point will specifically focus on training, it is impossible to cover the realm training and preparation for operations in a megacity without mentioning the foundational doctrine and supporting facilities required for training. In order for the megacity force to achieve success through training, the Army’s current urban operations doctrine requires updates to include megacity conflict, a foundational training program in order to certify the force, and the creation of physical training environments to closely replicate the OE.

The Army’s urban operations manual, FM3-06, is based on traditional forms of offensive maneuver, such as controlling a perimeter and fighting inward, utilizing tasks such as isolate and block. This approach was fundamentally successful in the recent Operation EAGLE STRIKE in Mosul, with a relatively small population, but would ultimately fail if applied to a megacity such as Lagos, Nigeria.¹⁷

In Operation EAGLE STRIKE the ISF faced a light infantry force from ISIS of approximately 3,000-5,000 fighters. The ISF faced ISIS forces who constructed a modified defense in depth by fortifying buildings, blocking avenues of approach, creating obstacles and utilizing an underground tunnel network for shelter and communication. The ISF campaign began with an isolation of the city and subsequent block by block clearance of “new” to “old” Mosul, successfully liberating the city.¹⁸ Key to the success of this operation was the use of an Iraqi Tank force, coordinated artillery fires, precision-guided munitions, and close air support/attack aviation. The ISF training of and reliance on these capabilities may work for a city and enemy like Mosul but would be impossible to implement within a megacity. The “old ways” of military operations within urban terrain are becoming irrelevant and do not account for the numerous mission variables present in a megacity.

However, the “old ways” of irregular thru conventional warfare may be thrust upon the megacity force and their partnered host nation forces. This must be included in the doctrinal update: if the adversary succeeds in utilizing these tactics to increase the level of conflict which precipitates large scale combat operations, the role of the megacity force then transforms from a partnered force advisor with limited objectives, to the SME advisors to the ground force commander. The megacity force must be scalable and tailorable to accomplish objectives through the entire range of military operations.

The 2015 CAERUS studied military operations within a megacity as a system of analytical frameworks or a living organism, thus pointing out the fallacy of applying old urban operations doctrine and training to a future battle inside a megacity:

Change the thought paradigm that an urban area is nothing more than a large number of buildings. The city must be treated as a system of systems or an “organism” because significant damage to any one part of it creates unintended effects across the rest of the city. Even within the established urban triad from Joint Publication 3-06, Joint Urban

Operations, there are other aspects and considerations, such as the social, cultural, informational, psychological, and temporal elements that must be accounted for due to their interconnectedness and interactions. Additionally, it is important to understand the “rhythms” of the urban area, such as how products and services flow through the city; the nodes that control, affect, or influence distribution of goods and services; and the ability to track flows over time.¹⁹

The specialized training for operations within megacities must start at the intelligence collection level. Achieving urban situational understanding and a common operational framework before stepping foot into a megacity is essential to success; and the challenges to achieving this understanding are numerous.²⁰ A G2/J2 section forward deployed from home station cannot merely provide a grid reference guide with numbered buildings to an operational force in a megacity and expect mission success. They must be a regionally aligned force with intelligence sharing partnership established with their regional and megacity allies. This partnered intelligence section must understand the OE through the analysis of ASCOPE and PMESII-PT.²¹

Detailed analysis and understanding of these variables will prove vital to the success of the megacity force and must be incorporated into the foundational training of every individual Soldier prior to assignment to a megacity unit. That success is defined as limiting the scale of conflict within a megacity utilizing partnerships with host nation forces, security forces and political advisors. The force must understand the interactions between the various populations, languages, ethnicities, and how they vary in density during specific work/travel/commute times of the day. A typical megacity can expand in population size anywhere from 1-3 million during the normal “work hours” of the day (0900-1700). The megacity force must understand that massive migrations in population create logjams on public transportation systems and infrastructure such as bridges, railways and ferries, and then effectively incorporate this

knowledge into mission plans. This understanding comes through embedded partnered training exercises with host nation forces and build off lessons learned and cultural experience.

The regionally aligned and trained force will understand the patterns of life within their assigned megacity and the close partnership with existing security organizations within the megacity will foster a greater understanding and prove decisive during execution. If the existing security force proves neutral and does not want to conduct partnered training, or even worse becomes a hostile indigenous armed government group, the megacity force again must adapt to the role of the “bolt-on” SME advisor to the JTF commander charged with achieving objectives within their assigned megacity.

Once the intelligence analysis is complete and enmeshed into the mission planning, the megacity force must prepare through specialized training for operations within a megacity. The multi-level terrain poses significant challenges to the operating force and therefore requires forces to maneuver throughout multiple dimensions simultaneously (surface, subsurface, air, space, cyber, information) to achieve effects on the adversary. Solving this problem means training to shoot, move and communicate underground, on the surface, inside a building, on a high rise, from the air, from the water, and in a cyber environment. Multi-domain, multi-surface training is required across all of the warfighting functions.²² All of these challenges require detailed training; training which necessitates inclusion in the recommended megacity force’s Mission Essential Tasks and trained regularly.

The individual through collective supporting training tasks require an environment to train in, and currently, the Army’s facilities are inadequate as replications of megacities. With regard to a megacity’s infrastructure and population, the “train as you fight” mentality is impossible to replicate at a current unit’s home station. The current urban operations training

facilities in the Army's inventory merely scratch the surface of replicating the OE of a megacity. With most facilities maxing out at a four-story building, no public transportation system, no network or communication system, and no population for an enemy to blend into, it is apparent that the Army requires an update to its current training areas. Outliers do exist, and these training cities are where the Megacity force must be forged prior to their regional alignment. The Muscatatuck Facility at Camp Atterbury, Indiana is a 160-acre urban training center which hosts a subway system, a coast line, a tunnel complex, a housing area and some dense urban terrain. With the incorporation of role players, this facility provides the closest replication available to the Army and should be utilized for the initial training of the megacity force.

There are other Military Operations in Urban Terrain (MOUT) training centers in the Army's inventory, such as the Shugart Gordon Urban Warfare Training Facility at Fort Polk, the Mckenna MOUT site at Fort Benning, or the Cassidy MOUT site at Fort Campbell. All of these examples provide a relatively "large scale" urban terrain, but lack the subterranean, public transportation, communications network, or other variables necessary to realistically replicate a megacity.

There are two courses of action the Army can take: first, invest in the existing MOUT sites such as Muscatatuck Facility at Camp Atterbury, Indiana with the goal of creating a solely "megacity" training center. The second option is to utilize an existing and active megacity for training. This option has been utilized by SOCOM and NORTHCOM in partnership with local state and federal agencies in a combined operation inside of a megacity, which establishes a precedent for partnered military training within a megacity. The megacity force should leverage this partnership and utilize US cities in their collective training plans stateside prior to assignment to their region. A megacity Soldier must be trained from the individual through

collective training tasks associated with the megacity mission essential tasks and must prove proficiency through training in order to receive assignment.

Both of these options present significant challenges to the Army; the former being extremely expensive and cost prohibitive, and the latter can cause a severe disruption of the city's population. This challenge presents as the most difficult to solve within the megacity problem set. A starting point is to update the current urban facilities the Army currently possesses, specifically at the National Training Center in California and the Joint Readiness Training Center in Louisiana. Then the Army must direct resources to create the Army Urban Operations School, similar to Mountain Warfare School or Jungle Expert School, focuses on learning the operational environment and training leaders to fight and win in a megacity environment. The graduates of this program will provide their commanders the subject matter expertise to fight and win in a megacity environment. Similar to the standardization of patrolling techniques throughout the Army via Ranger School graduates, the Urban Operations School graduates will attempt to standardize the megacity forces tactics. As the U.S. Marine Corps' Ellis Group stated in their 2016 study of 21st Century Urban Operations:

Urban terrain is not unique due to its compartmentalization, multidimensional character, or lines of visibility. The same characteristics are found in mountainous and jungle terrain. What sets the urban environment apart is the sheer density of people living in the environment.²³

This aspect is critical and the population density must be replicated in training. Conducting operations in a crowded subway tunnel, bus terminal or train station are not unrealistic expectations for a megacity force, and therefore the scale and scope must be replicated in order to effectively train this specialized unit. This is accomplished through partnering with an existing populace of a megacity or piggybacking on another agencies training is a way to incorporate the scale of role players needed to replicate the megacity populace.

Training to gain access to a megacity is also vital in building capabilities of the force. The megacity can be accessed through Multi-Domain Operations (MDO), and the megacity threat must be trained and adaptable to utilize whichever access point proves not only opportunistic, but also which option better supports the limited objective. The force must be able to be vertically inserted via aircraft or horizontally inserted via ground transportation or through a ship to shore connector. These approaches all require tailored training that must be conducted in a joint environment in order to achieve the mission essential tasks and critical task lists that define the megacity force. While this capability currently exists within current Army forces, with airborne/air-assault units, these forces focus training on one aspect of the JFE, where the megacity force will be trained across the spectrum. The smaller size of the megacity force will enable the unit to conduct more specialized training opportunities and see higher throughput in specialty schooling.

Next, the Army must build partnerships with civilian authorities and agencies in order to conduct scaled down partnered training within a city/megacity. Currently units participate in Defense Support of Civil Authority real world situational training scenarios across the country. These current exercises focus mainly on disaster relief, pandemic outbreak, and civil unrest (i.e.- protests or rioting), and can easily be organized and scaled to fit the operational needs of the challenges presented within a megacity.

The Opposition Force (OPFOR) utilized in this training must be well trained and outfitted with the latest technology and weaponry. Simply dressing Soldiers in OPFOR “uniforms” with M4s and asking them to play the enemy is not useful and creates bad habits. AWG recently set the precedent for OPFOR in the AWG Contested Micro Experiment (ACME). They created a force in both size, training and technology; ranging from irregular guerilla warfare insurgents to

synchronized insurgent cells utilizing commercial-off-the-shelf-technology against the U.S. Forces. This concept allowed the Army, or Blue Forces (BLUFOR), to progress their training from simplified to complex within days. This concept must be adapted by the megacity force in order to realistically prepare for the ever-evolving threat inside their respective AO.

Finally, the training at a digital training center capable of to-scale replication of the OE, with supporting network and communications systems and allow for proper wargaming.²⁴ In order to conduct this training to standard and prepare for expeditionary through sustained operations in a megacity, the force must first possess the proper equipment.²⁵

Materiel

The cost of unpreparedness is high in the lives of our Soldiers, Sailors, Airmen and marines; let us swear on their graves we will never send [others] into combat unprepared.²⁶ – U.S. Army Chief of Staff Gen. Mark A. Milley

The current panoply of Army materiel and the respective capabilities of that equipment, analyzed via the shoot, move and communicate spectrum falls short of the requisite capabilities required to fight and win in a multi-domain operation within a megacity. The megacity force must be outfitted with the latest technology to enable the force's ability to shoot, move and communicate effectively.

Shoot

Utilizing weapons within the OE of a megacity presents multiple challenges: collateral damage from explosions, overpressure from weaponry fired in confined spaces and the restriction of maximum distances of optics and munitions.²⁷ Weapons standoff technologies are negated by the megacity multi-level structures. The current infantry rifle company is equipped with weapons and optics developed to engage targets with maximum standoff. This means weapon systems with a maximum effective range of well over 1000 meters and rifles with

effective range of 300 meters. . Comparatively, the average size a city block in New York City is 80 x 274 meters. This figure of 274 meters long is relative to how many obstacles are currently present on the road at that time (i.e.-traffic, construction scaffolding, signage on buildings). Additionally, the average skyscraper height in NYC is approximately 345 meters tall. Given this data, one can realistically assert that on surface level, the megacity force must be equipped to acquire and engage targets within a planning distance of 300 meters or less. The Army currently has in its inventory a variable magnification combat optic that should be outfitted on a short-barreled (11-14 inches) version of the M4 or similar automatic rifle in order to solve this problem.

Distance is not the only problem presented via weapon and optics inside a megacity. The potential of collateral damage is ever present on the battlefield, but the megacity multiples this potentiality 100-fold. The megacity fight remains a close fight, block by block, subsurface to elevated, to super surface and finally airspace. Given this, the type of weaponry and munition brought to this fight must be considered carefully, or the risk of collateral damage becomes too high and degrades mission objectives or goals.

The battle of Fallujah in Iraq demonstrated the capabilities of an anti-tank weapon system employed in an anti-personnel manner. The TOW-2B, AT-4, Javelin, M3 Carl Gustaf were all preferred weapon systems in that urban fight; however, these weapons also produced an extremely high level of collateral damage. A TOW-2B leveled entire buildings in an anti-sniper operation. Recently the battles within Syria in the cities of Aleppo in 2012 and Raqqah 2017 demonstrate the capabilities and destructiveness of close air support/attack aviation and indirect fire in a city.²⁸ Everyone has seen the highly published before and after photographs of the Syrian War and battle against ISIL, but these photos do more than shock and raise eyebrows,

they display the destructive power of high explosive munitions used within a dense urban area in support of a military operation. The city of Aleppo may never be able to be rebuilt and or inhabited again. The debris and rubble alone make it nearly impossible to establish daily patterns of life.

The capacity in which the megacity force will be utilized is to achieve operational or strategic goals within a megacity while limiting the collateral damage and interrupting the populace's current way of life. Further, these examples of excessive collateral damage illustrate the need for the megacity force to utilize precision-guided munitions in an indirect fire/close air support capacity, as well as utilizing weapons designed for close quarter battle in order to reduce collateral damage within a megacity.²⁹

Move

Entry to a megacity poses a much larger problem set than this paper will discuss, however, there is a need to present the problem of access to a megacity. With the current Anti-Access Area-Denial (A2AD) technology available, it makes the megacity force's entry into the operational environment extremely challenging. This dilemma cannot be solved unilaterally, it must be solved as a member of a joint force utilizing all the available capabilities in order to penetrate into the disruption zone and transport the megacity force into battle zone. All warfighting functions must be employed across all domains in order to achieved the goal of movement within the OE, however none are more decisive than the electronic/cyber warfare and information operations. These capabilities are decisive in their ability to enable the joint force to disrupt or defeat adversary A2AD assets and penetrate the megacity. However, entry to the megacity is not the only challenge in terms of movement with the OE. The megacity force must

gain access to the OE, understand the existing public transportation system, and utilize vehicle platforms that enhances ability and provides agility while reducing collateral damage.

Once into the battle zone of a megacity, the challenge of movement in and around the OE becomes clearer. Surface movement within a megacity presents obstacles to an ordinary driver of a passenger vehicle, therefore expeditionary maneuver in a megacity may offer solutions for achieving partner interests and strategic objectives while limiting the disruptions to the populace³⁰. Therefore, the Army must review the current vehicular inventory and assess which platforms provide the greatest flexibility, adaptability and maneuver within a megacity. Vehicular movement within a megacity utilizing the current vehicle platforms the Army employs for urban operations, the MATV, HMMWV and the Stryker, present as insufficient as these platforms are too large to operate within city limit and all of which possess a chassis much larger than any commercial SUV on the market. Not many streets within megacities can accommodate ultraheavy (greater than 20 tons) and heavy tracked and wheeled armored vehicles over time. These ultra-heavy vehicles will destroy critical infrastructure (i.e.-powerlines, water mains) and produce collateral damage simple by movement alone. This creates a negative effect on the populace of the city and can negate any positive goals or objectives achieved. Therefore, these heavily up armored, tracked vehicles must not be employed in a megacity setting.³¹

Navigating congested streets in a large military vehicle stuck in traffic congestion, roadblocks or other obstacles present a soft target for an adversary to exploit. The megacity force must be able to rapidly acquire access to and utilize public transportation systems as well as bringing their own organic vehicle to the fight. The Army must equip the land force with a narrow-bodied, light vehicle capable of delivering components of the land force from an operating post to a limited objective safely and securely.³² The Army is currently in the process

of replacing the HMMWV with the Joint Light Tactical Vehicle, but this vehicle is still not suitable for a megacity. The JLTV is large, slow, heavily armored and more suitable for non-restrictive to restrictive terrain, not the severely restrictive terrain presented inside a megacity.

The Light Cross Domain Maneuver Platform (LCDM-P) has proven useful in the recent ACME exercised conducted by AWG. The concept is vehicle agnostic, however the platform utilized for the exercise was a commercial off-road Polaris MRZR-4. This basic platform was enhanced with Mission Command systems (HF/FM,BEAM), EW Systems (VROD/VMAX), and light armor. Once complete, this platform, capable of carrying six soldiers, could be inserted via rotary wing insertion/airdrop or roll-off via a ship to shore connector. This flexibility and maneuverability, combined with the capabilities to provide EW and mission command are key to supporting the megacity force.

Communicate

Dense urban infrastructure inside a megacity makes it extremely difficult to communicate and employ electronic systems in conventional means. The megacity force must be capable of communicating in a denied, degraded and disrupted environment. The megacity force must prepare to utilize existing communication platforms and critical nodes inside the city in order to effectively communicate. The pre-existing infrastructure of networks and repeaters will prove vital in sustaining communications during operations. However, the force must also be prepared for those existing platforms to be denied, and therefore reliant on their organic communication equipment. The Army's current communications platforms fall short of achieving the objective of supporting uninterrupted communication during operations within a megacity, specifically when applied to sub-surface communications. Adversaries and non-state actors know the current ranges and limitations of conventional communication systems and will attempt to negate their

advantage in a megacity fight via disruption, degradation and denial. In order to effectively communicate within this environment, the megacity force must gain access to the existing network/communication systems and be trained and equipped to communicate across the spectrum.

Access to the megacity's existing communication network also presents a challenge to the Army. Again, the adversary's A2AD defense systems as well as layers of encryption and cyber defense prevents the megacity force unhampered access to the network. This challenge can be solved through utilizing a partnership with the agency or force responsible for the access to the megacity's network, or, in a contested environment, by leveraging our partnerships through JIIM and the MDTF in order to utilize all capabilities in order to penetrate the A2AD ring and gain access to the communications system and cyber domain.

Subterranean communications will become key and decisive as almost every current megacity possess a vast underground transportation network. The need to develop and equip the force with a communications platform capable of penetrating layers of concrete and earth, securely and encrypted, is paramount. The current technology being tested by the Army relies on easily targeted and defeated repeaters. The Army must apply a joint, interagency, intergovernmental, and multinational (JIIM) operational approach to this challenge. The megacity force's ability to communicate and employ electronic systems relies on a partnership through JIIM utilizing and synchronizing all available mobile network systems in order to communicate securely throughout the megacity. Currently, the equipment and technology in the Army's inventory would prove cost prohibitive with unrealistic duplication and use of repeating stations and re-transmitters within a megacity in order to achieve the desired effect.

The Risk vs. Reward Paradox

There is a strong argument for the Army not to shift their focus of efforts regarding organization, training, and materiel and prepare for operations within a megacity; however, the Army must fight where the people are and where the battle is; continuing to grow closer and closer to the borders of a megacity, and therefore must prepare accordingly.

The argument against conducting military operations within a megacity is the risk to force verse reward test, meaning that the risk to a unit and the ensuing collateral damage is not worth the end state or objective. As seen in Hue City, Mosul, and Raqqa, fighting in dense urban areas can be slow and destructive. It can wear out an operating force and make policymakers question the legitimacy of their political objectives.³³ As Daniel Goure from the Lexington Institute states, “There is no example of a major urban operation in the last 100 years, even before there were megacities, which was not long, destructive and bloody, not only to the combatants but also to the civilian inhabitants and infrastructure.”³⁴ Although Goure is correct in his proclamation that these battles have incurred the scale of collateral damage he states, it does not mean that limiting collateral damage is not an option. The examples which he uses in his statement are all battles in which conventionally trained infantry forces have conducted military operations in a dense urban environment. Had these units been organized, trained, equipped and regionally aligned megacity forces, the extent of collateral damage could be reduced significantly while still achieving limited objectives.

This risk to force can be reduced with a specially trained and regionally aligned force, in partnership with local agencies, is utilized to achieve limited objects inside a megacity with reduced and acceptable levels of collateral damage. This argument can also be proven false when applying the United Nations Right to Protect or R2P against a problem set located within a megacity. If a transnational non-state actor within a megacity gains competitive control and

begins to conduct mass atrocities, crimes against humanity or full-scale genocide, and America's leaders vote to interject, it then becomes incumbent upon the Army, as part of a NATO or UN Sanctioned force to enter the megacity, neutralize the threat, and protect the human rights of the citizens under oppression.

Conclusion

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. However undesirable, even ghastly, it would be to throw Americans into dangerous megacities, the prospect is realistic enough that it must be taken seriously.³⁵

If the existential threat of military operations within a megacity continue to be wished away, the Army will find itself operating in this complex environment on an adversary's terms. Military operations in counter-insurgency post 9/11 have drawn the Army into urban operations inside cities where adversaries recruit, resource and hide. Future operations inside megacities may not replicate the years of conducting counter-insurgency operations, instead may be focused on humanitarian relief, Defense Support to Civil Authority missions at home (post natural disaster i.e.-Hurricane Sandy), or in support of combat operations overseas as part of a joint force.³⁶ The United States Army must adapt now across the DOTMLPF-P array in order to meet the challenges presented with conducting urban operations within megacities. In order for this to happen, it needs to become a priority or initiative of the Chief of Staff of the Army and other senior commanders. In order to prevent the Megacity MDCOA, the megacity force needs to become the immediate priority by the Chief of Staff for funding and development.

The Army must implement immediate changes and prepare now for the megacity fight. Through the organization, the Army must develop a specialized megacity force which is

regionally aligned within a COCOM with specific focus on the megacities within that COCOM's AO. The forces should be developed at the Brigade size, as the brigade is the foundational building block of the Army, and deployed to conduct operations as company teams. This provides greater flexibility to the megacity commander and further provides the COMCOM Commander with the capabilities and capacity required to conduct operations throughout their AO, not just one megacity.

This brigade size unit should be constructed as the Security Force Assistance Brigades were, organized and led through experienced and talented officers and NCOs. This force requires fewer initial entry Soldiers as the specialized training requires time commitment and experience in the field.

Next, the Army must train this newly organized force. This requires a state-of-the-art megacity training facility, which can either be accomplished through building upon the current MOUT sites within the Army's inventory, or constructing a brand-new site from the ground up. This facility must replicate, as close as physically possible, an active megacity. Replication of infrastructure, public transportation systems, subterranean networks, electromagnetic spectrum signals, and a dense population. Replication through training has proven successful in the Army's National Training Center and Joint Readiness Training Center, and should be emulated in the megacity training center. However, unless provided with the proper, state of the art equipment, the land force, as seen in Mosul, will be forced to quickly adapt in order to compete with adversaries utilizing adapted commercial off-the-shelf technology.

This equipment update and fielding must cover the shoot, move and communicate spectrum. The megacity force must field a new inventory of weapons aimed at reducing collateral damage to both civilians and infrastructure. This means fielding variable optic long-

range rifles for precision firing, restricting munitions types and usage areas for indirect fires, and utilizing strictly precision-guided munitions from close air support.

As traveling by foot within a megacity presents an obvious challenge, the force requires a lightweight, easily navigable, vehicle which can transport them safely and securely from city periphery to city center. The current inventory on vehicle platforms are not suitable for this challenge and therefore the Army must adapt their current JLTV that provides the capability and durability required by the megacity force.

Moving through the city the megacity force will find itself unable to rely on tradition line of sight communication platforms, and can easily be jammed or unknowingly degraded through existing electromagnetic influences currently present in a megacity. The force must be trained and equipped to quickly establish communication nodes upon the existing infrastructure of the city, i.e.- pirate or piggyback a signal or system of signals. The force must also be equipped with a long-range communication system capable of operating up to 100m below surface level, and within severely restrictive subterranean areas. The use of swarm repeaters or signal boosters will prove vital to underground communications.

Currently, an adversary can and will identify a capability weakness of the Army and exploit it, and unless the Army quickly adapts and prepares for this emerging operational environment, it will find itself unprepared and un-trained to tackle such a monumental challenge such as a megacity.

The migration of populations toward cities is undeniable, so too are the emerging drivers of instability which accompany these blossoming population densities. Therefore, if land power is the tool to achieve strategic objectives across domains, then it must be applied to the megacity problem set. Furthermore, the Army, as the nation's premier land power, must lead, and take

responsibility for the challenges presented within megacities and quickly adapt its approach to organizing, training and equipping the force.

Lastly the force must continually conduct research and ongoing studies into the megacity and the emerging megacities, as no two are alike. Then must develop contingency plans for these megacities, conduct digital wargaming and analyze and implement the results and lessons learned. It cannot be as simple as organizing and developing a new force; it must be a continually refined process through training, education and partnerships.

Sun Tzu adage of “never attack a fortress” is applicable for the 6th Century as well as today in the 21st Century. The creation of a megacity force is decisive for the Army in the prevention of a large-scale megacity kinetic conflict, but if this becomes inevitable, the Army will be better prepared. This force must focus on attacking a portion of a megacity to achieve a limited objective, and it is incumbent upon the Army, as a member of the joint force, to be prepared to fight and win in an extremely complex environment.

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