Megacity Madness

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Journal Article | *Jun 8 2016 - 8:43am*

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Are you in an urban area? Can you look around without seeing anyone? Try talking without being in earshot of someone who can easily overhear your conversation. Try walking side to side, front or back without having to watch out for someone or something. Now imagine the size and frequency of these events, so vast it takes hours to get to a place where you don't have these experiences at every turn. If these all exist you're probably in a megacity. So what is one? No one really knows, and that's a problem. Trying to define a megacity is hard enough, trying to win a decisive action, engage in governance and rule of law, or trying to provide relief? It could be maddening. So what is a megacity? US Supreme Court Justice Potter Stewart is famous for a remark in 1964 about pornography that he knows it if he sees it.1 That mental approach doesn't suffice when thinking of a megacity. More importantly we can't interact with it based on such a shallow understanding. The United Nations arbitrarily defines a megacity as something larger than 10 million people. John Wilmoth, Director of the UN's Department of Economic and Social Affairs (DESA) Population Division rightly states, "Managing urban areas has become one of the most important development challenges of the 21st century. Our success or failure in building sustainable cities will be a major factor in the success of the post-2015 UN development agenda."2 The problem is bigger even than a megacity. It is how to consider one. How does the international community analyze megacities? Reviewing over 400 documents, website and blogs suggests there's no single analytic, comprehensive tool for analyzing this new phenomenon.3 Arguably this is a classic interdisciplinary topic requiring a complex framework for analysis and evaluation, and ripe for innovation and creativity (design thinking).

The paper outlines a few ways to think about and analyze a megacity and make recommendations to prepare for operations in such an environment. The recommendations herein could not all encompassing, and likely never will be. It is an introduction by which a person or organization may consider the myriad of issues regarding a megacity, that when combined become vexing if not a wicked problem. But these problems are not insurmountable, nor impossible to operate in successfully.

Cities are often thought of as systems of systems. Utilizing this framework to conceptualize the issues in a megacity then allows the application of previous ideas that have been proven.

Problems may arise when the sheer scale of a megacity's issues come into play. This is where design thinking and generating multiple options rapidly allow for these issues of scale to be addressed, and thus be useful in the context of a megacity. We have lived and worked in some of these megacities, and watch with great interest the growing number of megacities around the world. There are a number of trends driving and driven by their growth. Among the two greatest are the draw of urbanization and the

increase in globalization. They are complimentary, not exclusive. They are not the only reasons for their growth either. The growth of urbanization is recognized by authors as wide ranging as Thomas P. M. Barnett, author of The Pentagon's New Map, to the Christian Science Monitor or Forbes, to global consultants such Accenture, Deloitte and Frost & Sullivan and McKinsey & Company. Each of these has a different vantage point, and each is moving towards a more comprehensive consideration of this challenging discussion on megacities.

The term megacities itself is problematic. While an accepted benchmark, it fails to account for other factors including the sophistication of infrastructure or transient populations. Some cities are categorized as a megacity by outside organizations but not by their own municipal governments. Some are megacities, no matter what we call them, or if there's disagreement.

They present a rich, urban and dense location filled with endless challenges and opportunities for engagement, partnership, and profit. Therefore, accepting definitions of a city and a megacity differ is of little import. This paper seeks to look at a megacity as one might a computer – the combination of software, hardware and what the outcomes are. In the case of a megacity, the hardware may be the physical, the plants and facilities, the roads, electric and plumbing, the buildings, trains and tunnels. The software is what travels over, to and through the physical, and may include information or data, energy, even people. Finally the outcomes, the humanistic realities others will have to recognize, deal with, and live by.

The hardware/software/outcomes framework of analysis for these urban areas is intentionally oversimplified because it lends itself to a set of parallel measurements allowing for improved analysis and evaluation with every iteration. Over the last two decades it seems the international community, scholarly and otherwise, settled on the number of 10 million. There's little good argument for this number. Rather it appears arbitrary with little rationale tied to it. It is important to recognize 10 million offers no additional value other than a fictitious threshold.

Does a city with 9.5 million behave in much the way one with 14 million? Yes. Size matters, but so do issues like population density and scale.

A recent example might be the impact the Zika virus is playing in and around the megacity of Sao Paulo. As we saw the reeling of the community to the sharp incline of microcephaly there were questions about its origin, its spread, its containment and the human impacts around the region and the globe. Some indicators suggest it was visitors to Sao Paulo for the 2014 World Cup games who brought the virus to the region, and fears by the International Community it will not be contained in time for the 2016 Olympics. Treatment of the virus, treatment of the mosquito and its vectors, and treatment of its victims vary, and there remains no cure.

Quarantine of Sao Paulo is next to impossible. Full scale assault by the International Community, along with armies of aid and health workers wouldn't solve the problem. How can we think of dealing with calamities such as this in a megacity?

Any operations normally conducted in a city will obviously occur in a megacity. Indeed, many such cities already have effective, established measures to continue with the day to day actions that those governments conduct. The likelihood of US forces of any type operating in such an environment is very high, including cities inside our own borders. According to the National Intelligence Council (NIC), by 2030 individuals will see a substantial increase in autonomy and prosperity. There's a growing notion that megacities are becoming their own little sovereign nations. The growth of the global population,

especially in urban areas, will lead to a majority of the world's population residing in cities where more economic and education opportunities exist. This urbanization will lead to a middle-class that is the "most important social and economic sector in the vast majority of countries around the world." With better access to education, affordable health care, and sources of information, the individual will be the driving force behind global change. This change may take on the form of renewed economic growth in historically poor regions of the world or allow super-empowered people to challenge the security apparatus and governmental legitimacy. These areas are then fraught with the potential for emergencies, man-made or natural. Situations such as this can be seen emerging in some areas of the world.

Situations that appear similar to those the US has previously operated in successfully. Urban Combat, Humanitarian Assistance, Stability Operations, all have been conducted by US Government agencies within the last decade. Scale however rudely interrupts the best-laid plans. These aren't necessarily new problems, just ones that planners may have believed solved previously. Need to bring water and food into a city that has suffered a naturally disaster? This has happened on countless occasions around the globe, both with US and international involvement. However what if the standard methods of bringing in supplies aren't feasible due to problems of sheer physics? If the normal seaport is closed and supplies must be trucked in but there are so many people to accommodate there is not enough physical space to park said trucks without clogging the supply routes. Issues that will compound when alternative remedies aren't available or don't meet the need in aggregate. So what kinds of analysis might prove useful in such an area? The list is long, and for the purposes of demonstration we offer only a few in the following paragraphs.

We're well served to think about communications and data and their growing importance to governance, awareness and human interaction. Consider well-developed megacities first. From London, to Seoul to Los Angeles, the physical infrastructure is governed by information. On the hardware front, information flows over copper wires, the airwaves and fiber-optics to keep things running smoothly. On the software front, data drives trains, planes and automobiles. On the outcomes front it cools towering high-rises so employees are more productive and computers don't break down, and warms delivery rooms for babies. The importance of the human in the loop is greater in developing megacities, but is ***the primary factor*** in all these systems. The presence of a functional technocracy keeps poor systems working. When these fragile systems are compromised the role of the technocrat becomes more apparent. Data isn't just important to the hard systems, they play a role in governance, especially during crises. How this data is developed, transmitted, consumed, etc, is more critical in a megacity than normal urban settings.

Another critical aspect to consider when analyzing any city is the population – as mentioned the primary human factor. This seems obvious, yet an in-depth understanding of populations is not always part of preparation. It is this fact that continues to vex US National Security Strategists in places like Iraq, Afghanistan, Syria and beyond. Cities exist to house, employ, and even contain human beings. The movement of people; their backgrounds, sociologies, education, ethnicity, gender and race; the culture(s) of the people living there; how these people choose to associate governance and politics; the work and social patterns of these people; the resultant rules and laws that are applied; how those rules and laws are upheld (or not); the services required for the people; and finally the tensions that exist, naturally, are all to be considered. Each of these could be layered in our conceptualization across four dimensions (three physical plus time = 4D = 3D + t). Unfortunately, there is little, perhaps no homogeneity or uniformity in these layers. To suggest we could just label each like a sheet of paper, and lay them atop each other is naïve and misleading. It is important to stress the way these layers interact across and with each other, though not in a linear fashion.

The alluded to human factor plays out on various stages, from the electromagnetic to the physical. In some cases those two above ideas of information and human landscape fuse as observed in the proliferation of social media. Decades ago, the Marine Corps had the foresight to describe the strategic corporal.4 While not a perfect analog, the idea is well founded, that individual actions can reverberate and cause problems far beyond the scope of the original intent. When thought of in the nineties the concept brought attention to the idea that the action of an individual operating at a low level can be perceived various ways when transmitted through modern media and lead to unintended strategic consequences. More simply, when attempting to engage one person the effects can be felt by millions. Often times this can be negative, as perceptions can be manipulated or capitalized on by various factions. This idea takes on a new significance when the millions of people that may have acquired a negative view of your operations are not found around the globe, but within ten miles of your operating space. These kinds of effects were observed during the Arab Spring in 2011, when social media enabled mobilization on a scale that superseded the capabilities of the government to react.5 Conversely, this could prove to be positive if leveraged properly. Imagine that when responding to a crisis that the local population actually becomes some of the best publicity as images of first responders handing out food or the removal of a particularly unsavory local character goes viral. This was present in nascent form on September 11, 2001 when the first responders of New York's emergency services became instant celebrities and people from Europe to Asia bought NYPD or FDNY tee shirts. This reality must be taken into account as technology only makes the capability easier. As observed by several police departments, anytime an officer stops for any reason, a camera is present, or should be assumed to be.6 This must also be present in the preparation military or other groups' conduct prior to operating in such urban sprawls.

So what can the US Government, the US Intelligence Community, and the Department of Defense, among others do to enhance the understanding of megacities? It must seek to resolve situations before they become problems. To accomplish that goal, members of those organizations need to be able to assess situations through frameworks that have not been the historical norm for the defense or intelligence communities. As with most problems, training and education are critical; a different mindset about solution development and employment, and less emphasis on fighting wars and more on avoiding them.

Training must instill an understanding of the challenges that will be encountered. Soldiers, intelligence operatives, a new breed of first responders, all should have an understanding of the megacity characteristics that may affect their operations. All must become comfortable operating in an area where they are likely to interact with the local population in any number of ways. Participating in multiple iterations of training is the underlying principle. Three broad areas, combining emergent technology and principles, come to mind that will enhance proper understanding through training.

1. *Virtual Reality (VR).* The benefits of this technology are often improperly communicated. It is not a substitute for live training. It is a platform that can be leveraged to conduct iterative training. The US doesn't have a range or live-practice area where it can employ new concepts for engagement in a megacity. Therefore, well-crafted VR offers a way to work at an individual to group size level across the four dimensions of a megacity, with an appreciation of the hardware/software/outcome framework. Virtual Reality doesn't have to be cost prohibitive, it includes more than the idea of someone wearing goggles projecting images directly to their optical sensors. It can also involve systems younger operators are intimately familiar with, gaming platforms or computers. The base from which ideas for training are culled from must be expanded. Utilizing scenarios presented in media formats that would normally be viewed as skeptical (e.g. fiction) need to be considered. It is

only through thinking in broad scope and considering possibilities however unpalatable that personnel will push their frameworks for understanding forward, even if the problems remain mundane in reality.

1. *Specialization*. New specialties that deal with the realities of urban infrastructure and populations are essential. Perhaps a pilot group of professionals from Special Operations Forces (SOF) could work with members of the State Department's Conflict and Stabilization Operations (CSO), and select member of the Intelligence Community to develop or cross-functional tactics, techniques and practices to deal with uncertain scenarios before they become problems. These aren't normally areas that operators are trained in, certainly not military forces. Using new frameworks will allow the military to work better across a whole-of-government construct, and in this likely absence be more effective at advancing non-escalating solutions in a megacity environment. Further, an education component should be developed where select members of the USG are trained specifically on these types of situations. These personnel would then be tracked while in government service and on stand-by to advise various organizations who are confronted or confounded by a particular megacity. The education would include living and working in a megacity, deep exploration and evaluation of the hardware/software/outcomes framework and the thinking therein. These are often called broadening assignments by the military and have not yet fully matured. Indeed it can be argued that despite the emphasis placed on them by some senior leaders, they are still not considered advantageous for personnel to participate in. This needs to change if there is going to be an expectation that defense professionals understand the various systems that may be encountered in megacities. It could lead to urban planning education tracks as the solutions are tested and approved over the next several decades.

1. *Practice*. As with any endeavor, practice gives confidence to those that will conduct operations. Whether in small teams and coordinated live exercises in the future, in VR scenarios, or on tabletop exercises designed for failure, not success, practice is essential. The idea is to reinforce the necessity to conduct multiple iterations. This could be possible with physical training, either in Department of Defense owned bases that are nearly abandoned or in economically depressed cities. These costs may prove prohibitive, which is where Virtual Reality may prove a better avenue. However it is enabled, multiple iterations will force trainees to thinkof different ways to overcome situations. This can be said of most any endeavor. The key to training for megacity operations will be to emphasize how to think of the various systems present. Easy to understand, easy to access templates can be established, _not_standards, for megacity challenges. Templates that convey understanding, not just lists, that explain why industrial or residential areas developed in a certain way in a geographic region. While no two cities have identical circumstances, there are well researched means of understanding the geographic layout based on history and resources. Why not more lists and standards? Standards are too static, and fail to allow for the flexibility required in a dynamic setting like a megacity. Part of the practice, building from the previous paragraph, would find a select group of US Government employees, and possibly service personnel "stationed" in megacities, working with the Nation State, the city governance councils, industry and the USG to learn more lessons, map out functions and add to the depth of understanding available on this complex topic.

Next steps? Do you buy these arguments? Along the way you were thinking, "I've never been to a megacity, and these guys are crazy". Maybe you grew up in Delhi, Tokyo or New York, and you think "these guys are mad". You're right. The thing is, megacities are hard, issues and problems compound over things that were solvable in other environments. They as difficult a challenge to plan for than anything the US Government has tackled previously. Of course, if you believe, as we do, that megacities may quickly resemble mini-countries, that you just need to change your thinking, you're also right. What we want to demonstrate is the importance of talking about them. The importance of understanding a megacity, and that they are more than a scale issue is critical. Our culture and our minds are designed to

limit choices, and when we're overwhelmed with data we tend to freeze. The time for this analysis paralysis is over, the time for movement and flexibility is here. A hardware/software/outcome framework is part of the solution, but it is only a small part. A paper ten times this size will start to introduce the many factors each of these three criteria could consider. Even then, much work is left to do. As Andre Guide said "There are very few monsters who warrant the fear we have of them." We needn't fear megacities, we must start working hard to sort them though.

The views expressed in this article are of the authors, and do not necessarily reflect the view of the Department of Defense, the Defense Intelligence Agency, the U.S. Army, or any other agency of the Federal Government.

End Notes

1 Justice Potter Stewart's concurring opinion in *Jacobellis v. Ohio* 378 U.S. 184 (1964).

2 UN Economic and Social Affairs Press release July 10, 2014. Accessed February 8, 2016 at esa.un.org/unpd/wup/Publications/Files/WUP2014-PressRelease.pdf

3 Collating the research materials and sources of the US Army Chief of Staff Strategic Studies Group white papers "Megacities and the United States Army", June, 2014 and "Readiness in an Urban Era," May 2015.

4 General Charles C. Krulak, "The Strategic Corporal: Leadership in the Three Block War," *Marines Magazine*, January 1999.

5 Taylor Dewey, et al. "The Impact of Social Media on Social Unrest in the Arab Spring" (Paper presented at Stanford University, March 20, 2012) 17-91.

6 Author's Notes from "Readiness in an Urban Era," US Army School of Advanced Military Studies Lyceum White Paper, May 2015.

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