Complexity of Military Operations in Megacities

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Abstract: Megacities are excellent locations for enemy headquarters and transportation hubs for revenue generating goods as well as weapons and supplies. Influencing these operations at a strategic level by targeting the systems upon which they rely will allow military forces to avoid direct engagement in particularly dangerous environments while still inhibiting the enemy. The high degree of interdependency between enterprises within megacities introduces unique challenges to decision makers who desire to engage the enemy without detrimental effects to noncombatants The Department of Defense is currently uncertain on how to handle the challenges of a megacity, specifically the unintended consequences of warfighter actions. This paper develops a common taxonomy for megacities to classify better the vague definitions associated with megacities and examine the unique challenges that exist in each. Using system thinking to frame the network of systems in these cities, we formulate a methodology using decision hierarchies and fuzzy cognitive maps to examine the second and third order effects that may arise from disruptions in one branch of the network caused by decision makers.

Keywords: Megacities, Fuzzy Cognitive Maps, Dense Urban Environments, Ungoverned Spaces, Systems Thinking