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# Managing Complexity During Military Urban Operations

## Visualizing the Elephant

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## SUMMARY

This document is a briefing that the author has provided to many audiences in various forms over the past three years. He was privileged in having had the opportunity to do so for the division, corps, and army commanders and staffs preparing to depart for Operation Iraqi Freedom during the closing months of 2002 and January of the following year. The work behind the slides and concepts is, it is hoped, another step forward in the RAND Urban Operations Team's effort to illuminate the complexity, heterogeneity, and vibrancy of urban operations for those given the responsibility to conduct them. The potentially overwhelming complexity and size of 21st-century urban areas compels us to find ways to understand their character and determine how to best allocate available resources in the service of accomplishing objectives. Only the very rare and extraordinarily fortunate organization will have sufficient assets to meet all of the tasks at hand. In such cases, the chances are that the urban area involved is but a town or at most a small city devoid of a robust and capable enemy. Larger cities pose significantly greater challenges. They will tend to demand far more capabilities and resources than those of even the largest of coalitions. The briefing seeks to provide both an understanding of the nature of these challenges and ways to determine where and how to employ what means a commander does have available.

We approach this challenge in two primary steps. The first seeks to provide an overview of the nature of the formidable tasks inherent in urban operations. They include a need to conceptualize the environment in terms of three dimensions—in volume rather than area—for virtually any grouping of manmade structures includes multiple stories, rooms, other enclosures, and, perhaps, underground facilities. The tasks encompass a requirement to adapt quickly and, ideally, to interfere with an adversary's ability to adapt, for rapid adaptation seems to be a characteristic of urban operations; the organization that does it effectively and in a timely manner gains a considerable advantage. Urban contingencies differ not only in the nature of the terrain. Though much of the ambient environment is manmade and poses its own challenges, at least equally as important is the extraordinary (in comparison with other

environments) density of noncombatants. History shows that it is they who tend to suffer the greatest numbers of killed and wounded during combat in their cities, whether from the fighting or from the deprivations of food, potable water, shelter, and medicines that accompany such struggles. They can suffer even in cases in which combat is limited or nonexistent: the close packing of people makes shortages of necessities more quickly felt and acts to speed the spread of disease. It is they who continue to suffer when combat has ceased and the combatants depart, or when the victor leaves the urban area bereft of the functioning infrastructure that its residents depend on for survival.

The second of the two primary steps itself has two components, each a somewhat theoretical but ultimately pragmatic way of approaching the challenges of urban military undertakings. Critical points are first discussed. The author defines these as “points or other elements that could have an extraordinary influence on the achievement of objectives.” They include the familiar concepts of center of gravity, decisive points, and additional elements that fit this definition. Critical points can be physical in nature: key buildings, important intersections, or vital streets or highways. Or they can be human: one or more community leaders, heads of family, or those who control one or more significant resources. They can also be components of physical or social infrastructure, or vital events or activities. Urban areas are by nature systems, which are themselves parts of even larger systems. The totality of these many systems can be staggering. The concept of critical points is offered so that those planning and conducting operations in urban areas can identify those nodes and the interrelationships between them that will have the most critical impact on mission success.

While understanding critical points and their interactions helps the comprehension of urban complexity, a second concept, density, provides a means of managing the remaining complexity. The relationship between critical points and density is a symbiotic one. Density, defined herein as “the number of elements per unit space or the quantity of activities per unit time,” helps a commander or staff member in his efforts to appropriately select critical points. If there exist very few of a particular urban asset within the urban area of interest (e.g., only one or two water treatment plants in a large urban conglomeration), those assets likely qualify as critical points by nature of their rarity (low density). The same

is probably not true if there is a plethora of these assets. Density further helps a commander determine what assets he needs to accomplish his urban mission and how to allocate them by providing a simple means of viewing the seemingly very complex. Urban areas share many of the characteristics that influence an operation in any environment. They have avenues of approach, potential firing positions, obstacles, lines-of-sight—all familiar to those tasked with accomplishing an assigned mission. Cities, however, differ in that they have a far greater density of many of these elements. Instead of one or two approaches across an open field, cities offer several streets, subterranean passageways, or routes through buildings. Rather than the occasional copse of trees or outcrop of rocks in which a foe could position an ambush, a single urban block might have hundreds of windows, porches, storm drain entrances, or other firing positions. Viewing challenges in terms of densities and overcoming densities provides a means of simplifying the overwhelming. The briefing describes in detail five specific ways of so viewing these challenges:

- match density with density
- effectively reduce densities
- maintain selected densities
- address density asymmetrically
- capitalize on urban densities.

A commander standing atop a high-rise amidst seemingly endless blocks of buildings or one contemplating an overhead photograph of a city housing millions of residents can be forgiven for finding such an environment a daunting one in which to operate. Together the two concepts of critical points and density offer a means to make manageable the chaos.