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Air Force Operations in Urban Environments Study

Abstract

Volume 1

As cities increase in number and importance, the population of the world gravitates toward these centers of commerce, culture, and society. Correspondingly, the cities will also attract an increasing proportion of military operations. Our adversaries know the complex urban environments present extremely difficult challenges for armed forces that have traditionally focused on the direct engagement of forces in open terrain. To be ready for the future, the Air Force must fully understand the future urban environments it will operate in and then prepare, train, and equip its forces for these challenges.

This study addresses the challenge of developing more effective Air Force Operations in Urban Environments. The study was conducted in response to a request by the Secretary of the Air Force and the Air Force Chief of Staff.

In response to their direction, the Urban Operations study team conducted an extensive set of visits to Air Force operating commands and key operations centers, and reviewed numerous briefings from Air Force, Joint, and coalition organizations concerning current operations, systems, and procedures, as well as proposed future system and process improvements.

The assistance of these organizations was essential to the completion of our effort. It was their involvement that guided the study team toward the findings, concepts, conclusions, and recommendations that comprise this study. The study team greatly appreciates the cooperation of these organizations and acknowledges the valuable contributions their efforts made to this study.

Volume 2

The relationship between air and ground operations changes dramatically as forces encounter an urban environment. In an urban scenario, many of the advantages of airpower are significantly diminished. The ability to use stand-off precision weapons is compromised because of severe physical and operational constraints, including buildings that constrain weapon flight trajectories and frequently block target designation. Decisions to fire are nearly always encumbered by serious concerns of collateral damage and fratricide, so the ability to respond rapidly is compromised. Targets are typically small and fleeting so desired timelines for support are shortened.

Communication is often compromised by blockage, multipath or interference in a dense signal environment. Intelligence, Surveillance, and Reconnaissance (ISR) is often limited because of noise, target obscuration and interruption of tracks -- all a result of the compressed population and layout of roads and buildings in the urban environment. Many of these limitations reflect the fundamental situation that warfare in open terrain is essentially two-dimensional while warfare in urban terrain is emphatically three-dimensional.