



United States Joint Forces Command

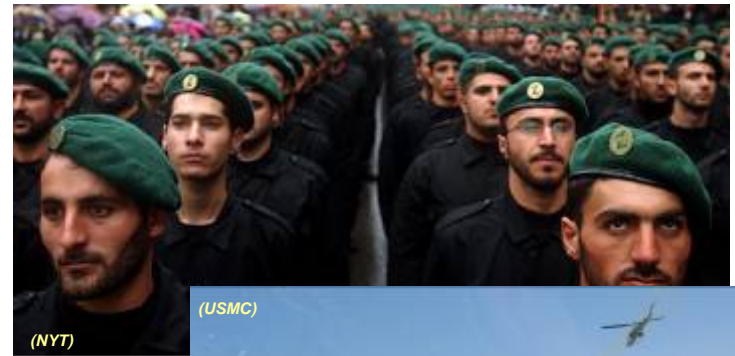
Technology Approaches for Irregular Warfare and Joint Urban Operations

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Irregular Warfare Joint Operating Concept

“Irregular warfare (IW) is a violent struggle among state and nonstate actors for legitimacy and influence over the relevant populations. IW favors indirect and asymmetric approaches, though it may employ the full range of military and other capabilities...” (Irregular Warfare Joint Operating Concept)

- Our adversaries will employ a hybrid of irregular, disruptive, traditional, and catastrophic capabilities to undermine and erode our influence and will
- Direct applications of military power are often counterproductive in IW
- Irregular Warfare is about people, not platforms or advanced technologies



Framing the Problem

Where Will We Operate?

MILITARY PROBLEM

How to operate within an urban environment to defeat adversaries embedded and diffused within populated urban areas

of

In 2006, 50% of the world's population lived in cities

By 2030, 65% will live in cities (5.5 billion human beings)

- Urban areas are complex living systems or ecologies that have evolved to sustain concentrated human societies in confined space
- Adversaries viewed as malignant growths embedded within and diffused throughout host urban system
- Any military action against the adversary will necessarily be traumatic for host urban system

Population - Critical Infrastructure - Historic Structures - Religious Sites

Framing the Problem

How Will We Operate?



Distributed/Dispersed – Small Units – Joint – Coalition – “Whole of Government”

Framing the Problem

Who is the adversary?



Unpredictable - Adaptive - Technology Enabled - Trained - Embedded - Morally Unconstrained - Criminal

Role of Technology in Irregular Warfare

Given that IW is “not dependent on materiel solutions,” what is the role of technology and how can investments be focused?

- **Expand effectiveness of general purpose forces for the full range of IW**
- **Improve preparation of forces prior to deployment, particularly with regard to training**
- **Improve understanding of environment and human terrain prior to and during operations**
- **Enhance capabilities to operate in complex environments**

IW Lines of Action

- **Information Operations**
- **Providing Essential Services**
- **Training and Equipping Local Forces**
- **Combat Operations**
- **Governance**
- **Economic Development**

Technology Development Considerations for Irregular Warfare and Urban Operations

	Adversary	Environment	Operations
Battlespace Awareness	 <p>Sensor Detection Sensor Defeat Signature Management <i>(IDF)</i></p>	 <p>Concealment Physical Clutter Congested Airspace Lines of Sight Non-Combatants</p>	 <p>Combatant/ Non-Combatant Discrimination System Visualization and Analysis <i>AP</i></p>
Command and Control	 <p>Communications System Attack/Defeat Communications Security <i>(IDF)</i></p>	 <p>Multi-Path Lines of Sight RF Clutter Attenuation <i>(US Army)</i></p>	 <p>Dismount BFT Distributed LR Comms Joint/Coalition Interoperable Low Tactical SA <i>(USMC)</i></p>
Force Application	 <p>Ballistic Protection Counter-Sniper Active Protection Jamming C-RAM <i>(Haaretz)</i></p>	 <p>Trajectories Compressed Range Collateral Damage Non-Combatants/Crowds Fleeting Targets <i>AP</i></p>	 <p>Small Unit Maneuver Precision Fires Fratricide Weapon Size <i>(IDF)</i></p>

Sample High-Payoff Approaches

- ***Immersive Training Systems*** that can dramatically improve individual and small unit performance across the full range of IW
- ***Non-Lethal/Less-Than-Lethal Weapons*** that are smaller, lighter, cheaper, multi-modal, available
- ***Low-Tactical Targeting and Fires Capabilities*** that enable rapid precision fires at the lowest tactical levels
- ***Position, Navigation and Timing in GPS-Denied Environments*** to enable BFT and other GPS-dependent capabilities in complex environments
- ***Reliable Joint and Coalition Tactical Communications*** that are effective both in challenging urban environments and over long-ranges
- ***Persistent Wide Area ISR*** providing coverage where and when needed
- ***Urban Systems Analysis and Visualization Tools*** that enable understanding of the complex urban system and its interrelationships
- ***IW Applications for High Powered Microwave Systems*** to counter highly capable threat systems with minimal collateral damage
- ***Through Wall Sensors*** that can detect, localize, and track people and weapons

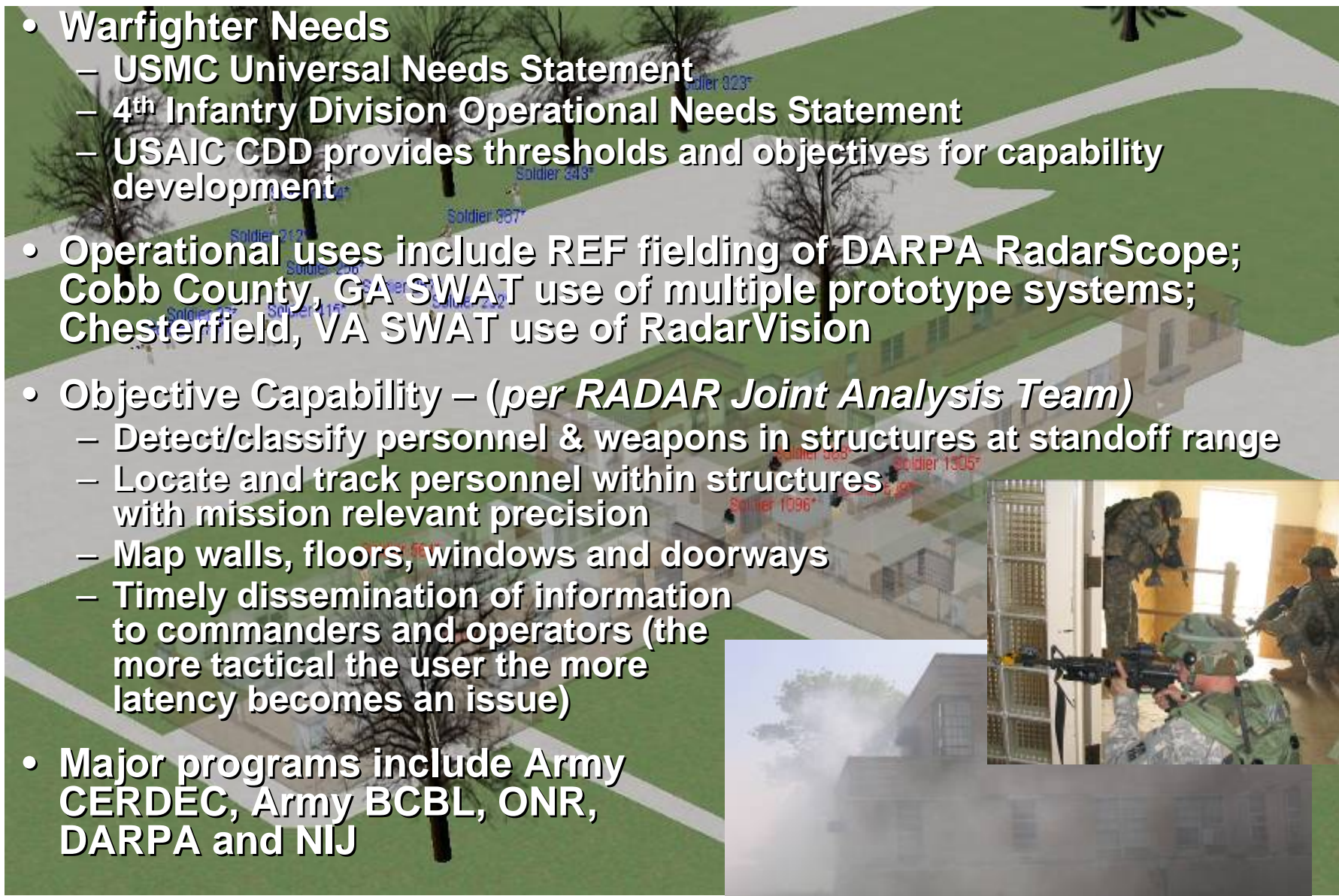
High Powered Microwave Systems

- Current, well-understood applications include Active Denial System (MMW) and vehicle stoppers
- AFRL HPM Division/DE Directorate
 - “A short burst of high-power microwave energy can be lethal to electronics while having no affect on humans”
 - “The low collateral damage aspect...makes high-power microwave weapons useful in a wide variety of missions where avoiding civilian casualties is a major concern”
 - Air delivered and ground variants, intended for attacks on facilities, C2 networks, etc.
- Potential IW/urban Applications
 - Disruption of C4 networks
 - Disabling sensor systems
 - Softkill of precision munitions



Through Wall Sensors

- **Warfighter Needs**
 - USMC Universal Needs Statement
 - 4th Infantry Division Operational Needs Statement
 - USAIC CDD provides thresholds and objectives for capability development
- **Operational uses include REF fielding of DARPA RadarScope; Cobb County, GA SWAT use of multiple prototype systems; Chesterfield, VA SWAT use of RadarVision**
- **Objective Capability – (per RADAR Joint Analysis Team)**
 - Detect/classify personnel & weapons in structures at standoff range
 - Locate and track personnel within structures with mission relevant precision
 - Map walls, floors, windows and doorways
 - Timely dissemination of information to commanders and operators (the more tactical the user the more latency becomes an issue)
- **Major programs include Army CERDEC, Army BCBL, ONR, DARPA and NIJ**



Conclusions

Technology has a critical enabling role in emerging IW and Joint Urban Operations concepts and doctrine

For technology to effectively support emerging IW and JUO needs, we must:

- **Clearly identify both incremental improvements and potential high-payoff (“disruptive?”) capabilities**
- **Ensure we understand and account for non-materiel improvements, particularly those already implemented in current operations**
- **Continue to re-balance our overall investment portfolio and re-orient technology funding priorities**

Don't Worry.....

Uncovering an Hizballah bunker adjacent to UN post



27.08.06

חשיפת בונקרים של החיזבאללה הסמוכים למוצב או"ם.

צילום: דובר צה"ל

Photo: Israeli Defense Force