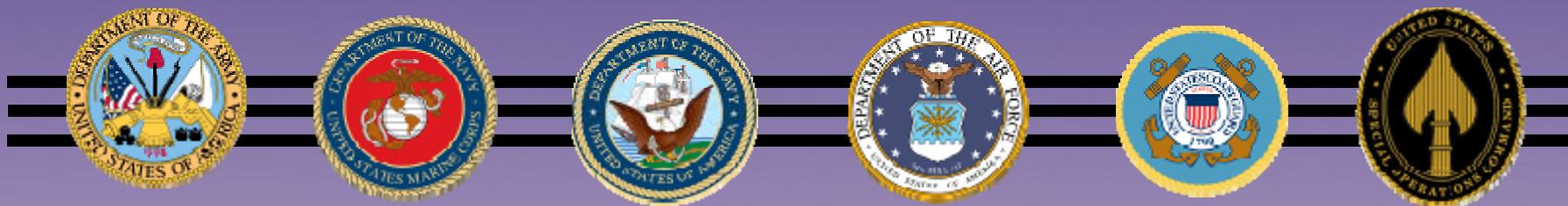




# Non-Lethal Weapons Directed Energy Vision: Prospects and Challenges

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***“We must balance our pursuit of the enemy with our efforts to minimize loss of innocent civilian life, and with our obligation to protect our troops”***

General David H. Petraeus  
Commander, International Security  
Assistance Force and  
Commander, U.S. Forces Afghanistan  
Tactical Directive, Aug. 1, 2010





# Department of Defense (DoD) Non-Lethal Weapons (NLW) Program



- Established in 1996 with the Commandant of the Marine Corps as the designated DoD NLW Executive Agent
- The Joint Non-Lethal Weapons Directorate serves as the Executive Agent's day to day management office, coordinating activities with the Services, Coast Guard, and other government agencies
- The Executive Agent has a research budget dedicated to developing and advancing the suite of non-lethal weapons available to U.S. forces
- The military Services (Army, Air Force, Navy, Marine Corps) are responsible for NLW procurement and sustainment



# Non-Lethal Weapons (NLW)



- NLW are escalation-of-force options that play an important role across the spectrum of military operations
- NLW provide a much needed option between verbal warnings and use of lethal force
- NLW allow warfighters to tailor their responses to challenging and diverse threats

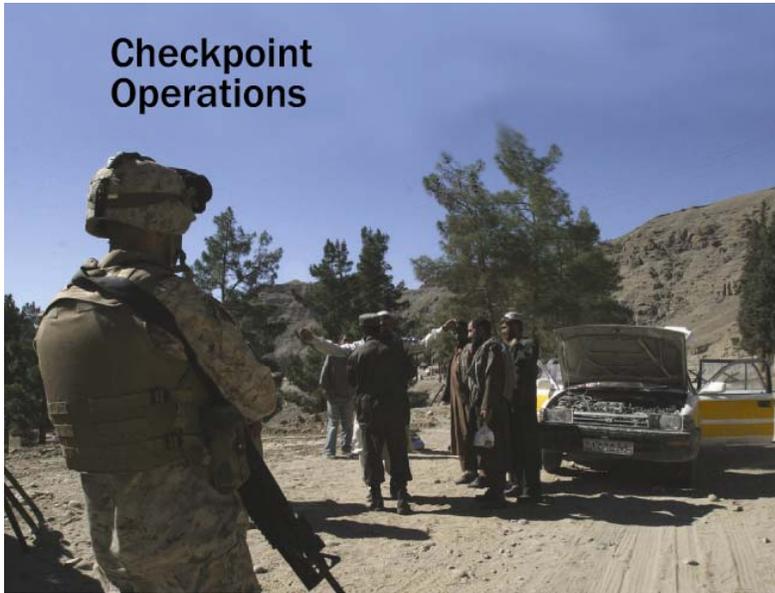
***Non-lethal weapons provide capabilities that can minimize loss of innocent life and protect our troops***



# Representative NLW Mission Applications



Checkpoint Operations



Vessel Stopping



Convoy Protection



Crowd Control



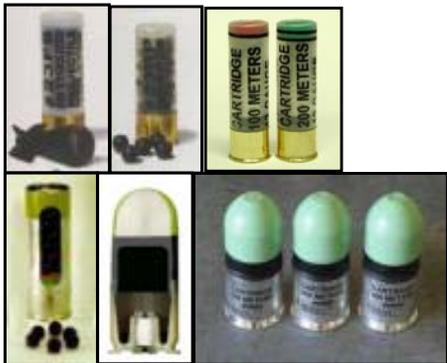


# Currently Fielded Non-Lethal Weapons

- *Includes Directed Energy capabilities such as dazzling lasers ...*



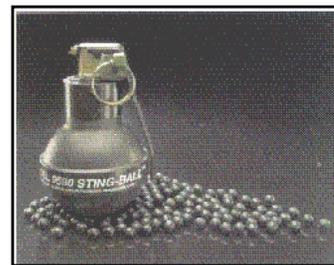
- *... however, majority are primarily short range, “low-tech” items*



12 Gauge / 40 MM Point, Area and Warning Munitions



Flash Bang Grenades



Stingball Grenades & Launch Cups



Vehicle Lightweight Arresting Device M2 Net

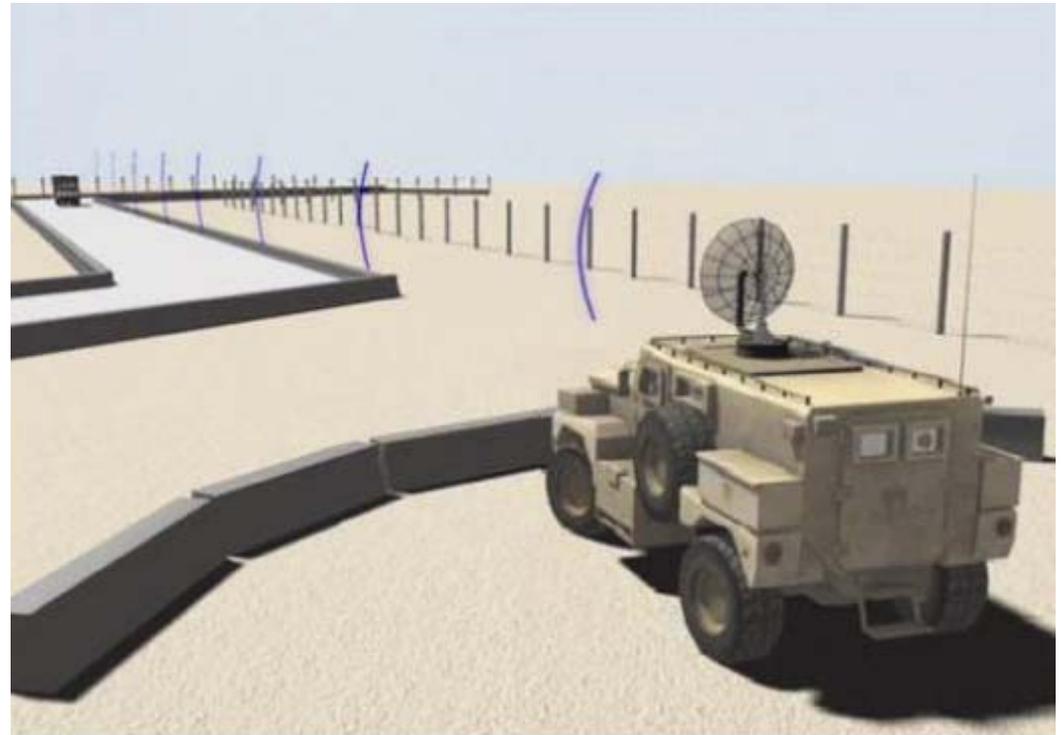


# Future Non-Lethal Weapons

- The vision is for a broad spectrum of Non-Lethal Directed Energy capabilities
- Providing our troops additional time and range in responding to diverse threats



**From this ....**



**... to this**



# NLW Directed Energy Concepts Currently Under Development



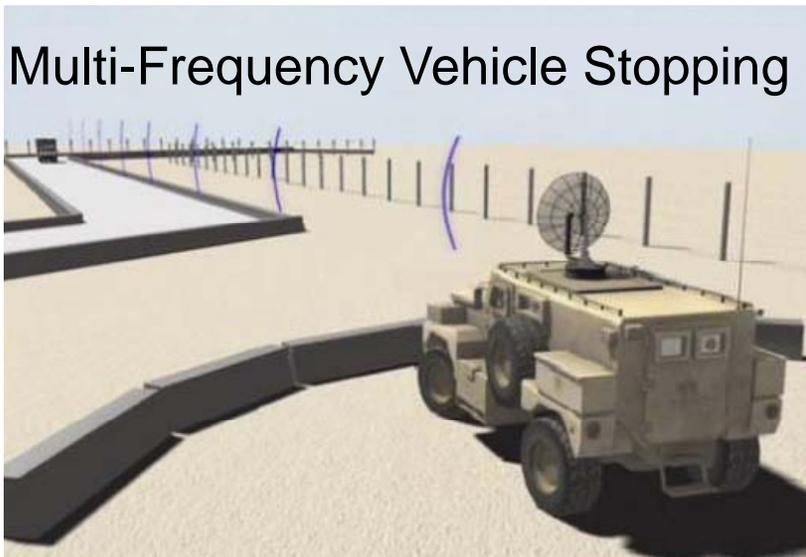
Long Range Optical Distracters



Radio Frequency Vessel Stopping



Multi-Frequency Vehicle Stopping



Active Denial Technology





# Basics of NLW Capability Development



***Non-lethal weapons in the Department of Defense follow the same development processes as lethal weapons***

- ✓ Well-defined Concepts of Operations
- ✓ Operator Safety
- ✓ Legal and Arms Control Compliance Reviews
- ✓ Test and Evaluation
- ✓ Human Effects Characterization (unique aspect of non-lethal weapons)



# Non-Lethal Directed Energy Weapon Challenges



- Reducing the size and weight of the technology
- Cost effectiveness
- Education and awareness
- Strategic communication



# Summary



- Non-lethal weapons provide capabilities that can minimize loss of innocent life and protect our troops
- The Department of Defense Non-Lethal Weapons Program is committed to advancing the suite of non-lethal weapons available to our forces
- On-going research is verifying that directed energy technology holds much promise for advancing non-lethal weapon capabilities