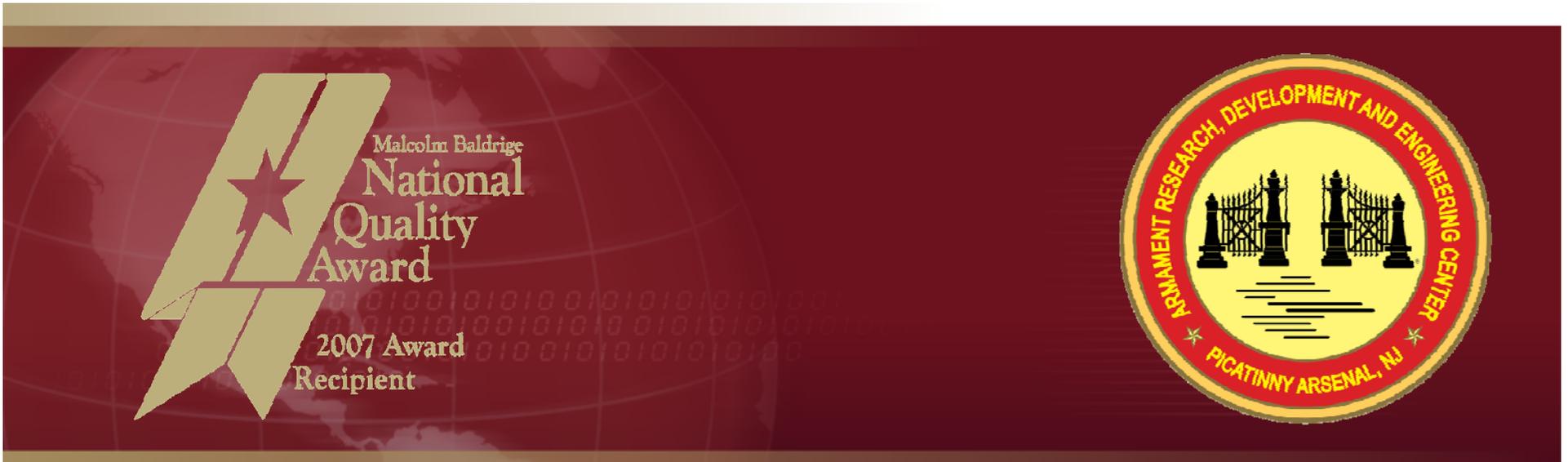




U.S. Army Armament Research,
Development and Engineering
Center



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

CROWD CHARACTERISTICS AND MANAGEMENT WITH NON-LETHAL
WEAPONS: A SOLDIER SURVEY

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14. ABSTRACT The Army's Target Behavioral Response Laboratory (TBRL) conducted an online survey to understand Soldier experiences with non-lethal weapons. The Crowd Management Experiences survey gathered information on the factors of mission, enemy, terrain and weather, troops support available, time available, and civilian considerations (METT-TC). Critical data on crowd size were provided that could be used to focus research efforts to optimize the ratio between effort and benefit. Moreover, the data from the Warfighters suggest that developers focus on designing weapons for sensory and motoric disruption that minimize injury. Many Warfighters, when given the chance, stressed the importance of understanding motivation, communication, and the interpersonal nature of the crowd-military control force encounter.			
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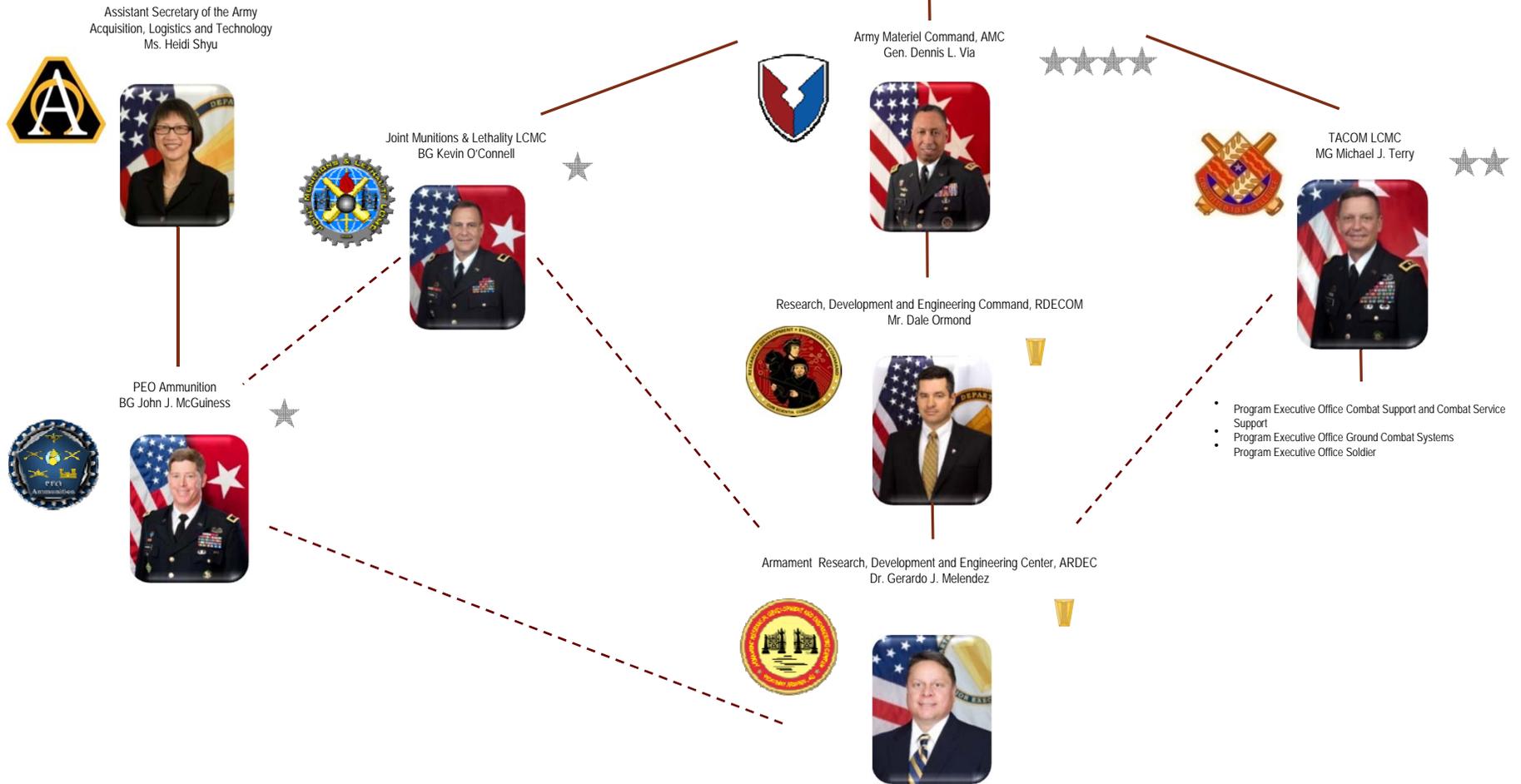
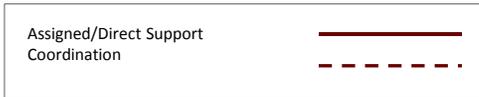
- **Introduction**
 - Target Behavioral Response Laboratory (TBRL)
- **The Soldier Survey**
 - Method & Format
 - Survey Questions
- **Results**
 - Crowd Characterization
 - Crowd Management
 - Crowd Control Planning
- **Soldiers' Recommendations**
- **Summary**
- **Sample Responses/ Results**



Photo Courtesy: commons.wikimedia.org



Headquarters, Department of the Army



ARDEC's Role



RESEARCH



DEVELOPMENT



PRODUCTION



FIELD SUPPORT



DEMILITARIZATION

Advanced Weapons:

Line of sight/beyond line of sight fire; non line of sight fire; scalable effects; non-lethal; directed energy; autonomous weapons

Ammunition:

Small, medium, large caliber; propellants; explosives; pyrotechnics; warheads; insensitive munitions; logistics; packaging; fuzes; environmental technologies and explosive ordnance disposal

Fire Control:

Battlefield digitization; embedded system software; aero ballistics and telemetry

ARDEC provides the technology for over 90% of the Army's lethality and a significant amount of support for other services' lethality

• Purpose

- The TBRL evaluates the performance of Non-Lethal Weapons (NLW) and scalable effects using volunteer human test subjects.
- Determine NLW performance
- Standardize testable NLW requirements
- Research underlying factors for highly effective NLW

Human Behavior Response Evaluation Test Beds

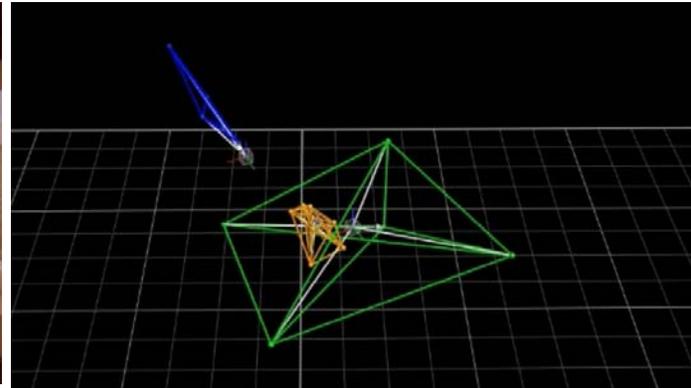
- **Payoffs**

- Benchmark data for current NLWs using real human targets
- A determination of “HOW” effective a NLW really is
- A determination of which NLWs are best suited for a particular situation
- Determine NLW performance
- Capability to measure improvements in NLW development
- Standardize testable NLW requirements
- Research underlying factors for highly effective NLWs

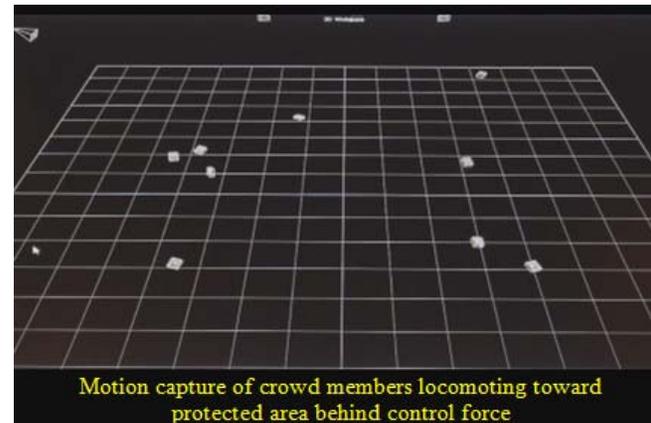


Introduction

Performance Evaluation at TBRL



- Performance of individual Soldiers using ARDEC systems



- Performance of Non-Lethal Weapons against targets

The Soldier Survey

Methods & Format

- To understand Soldiers' experiences with Non-Lethal Weapons
- “Crowd Management Experiences” survey gathered information on factors of mission, enemy terrain, weather, troop support and civilian considerations
- Approved by the local Human Research Ethics Review Board (ARDEC IRB# 09-0001, Crowd Characteristics on AKO)
- In Total 22,721 active duty Soldiers invited to take the survey
- 314 Warfighters responded and completed the survey

The Soldier Survey

Survey Questions

- Asked to report the number of crowd control missions, their reasons for the crowd gathering, how those gatherings interfered with the mission
- The crowd size, goals, capabilities, cultural aspects, and basic demographics
- Levels of personnel and equipment required to manage the crowds
- The characteristics of the crowd and the control force
- Recommendations for the researchers and developers
- More in-depth questions with open ended questions

Selected Findings

- **Control Force**

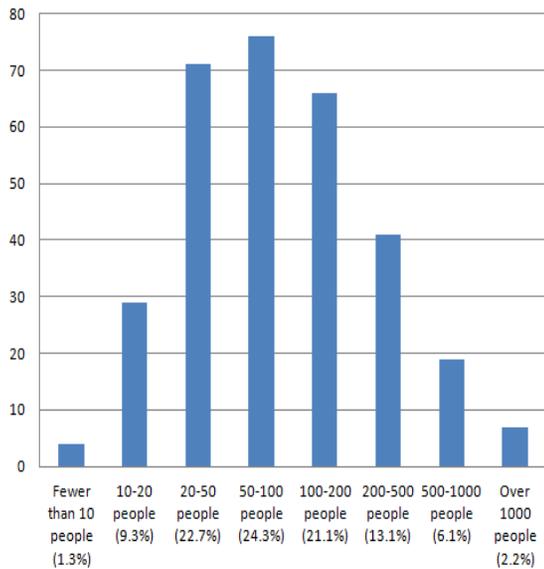
- 70% indicated that their unit was involved in crowd control situations during their most recent deployment

- **Crowd Size**

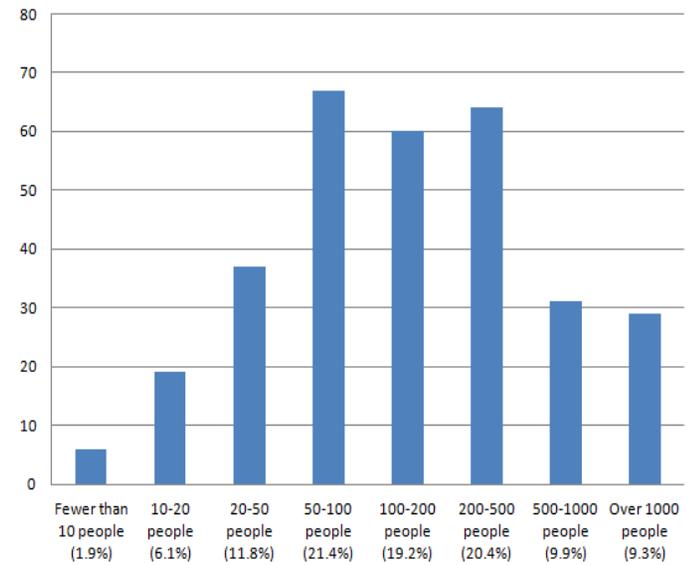
- Typical crowd: 20-200 people
- Largest reported crowd size: 50-500

Results – Crowd Size

In a TYPICAL mission that involved crowd control, about how many people were in the crowd?



What is the LARGEST crowd size you had to deal with?



Results

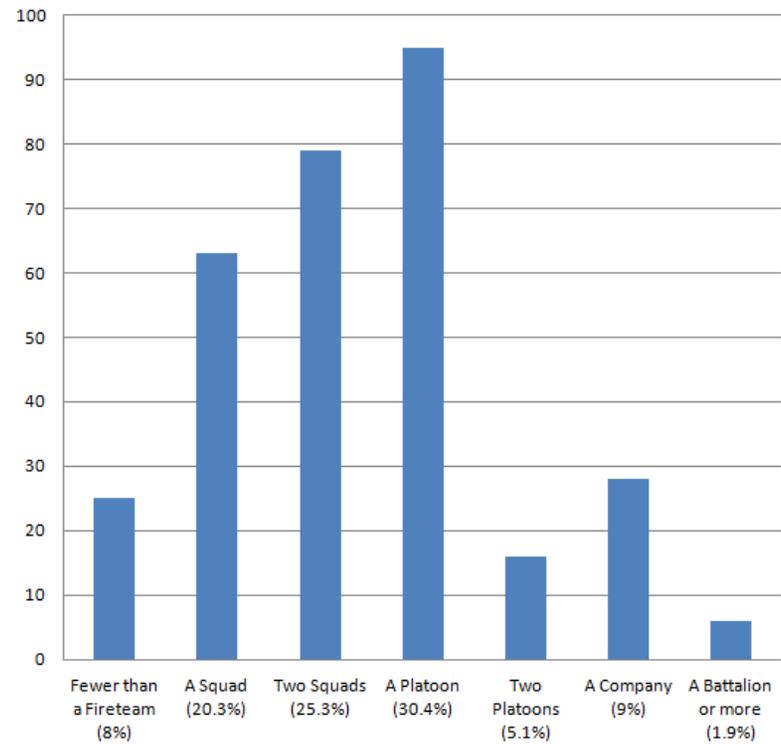
Selected Findings

- **Control Force**

- 16% of respondents stated that a force rarely larger than a platoon used for crowd management

Results - Control Force

In a TYPICAL mission that involved crowd control, about how many friendly forces were used to control the crowd?



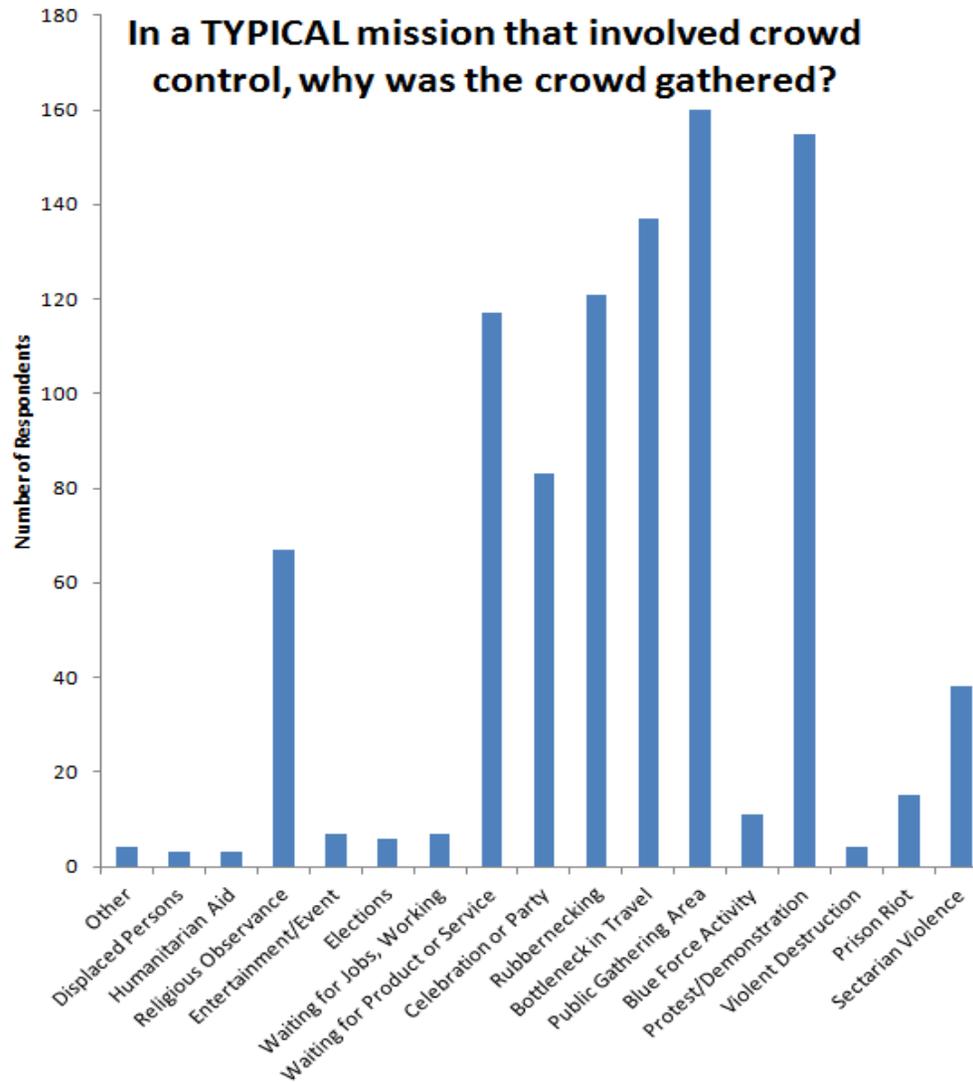
Results

Selected Findings

- **Crowd Characterizations**

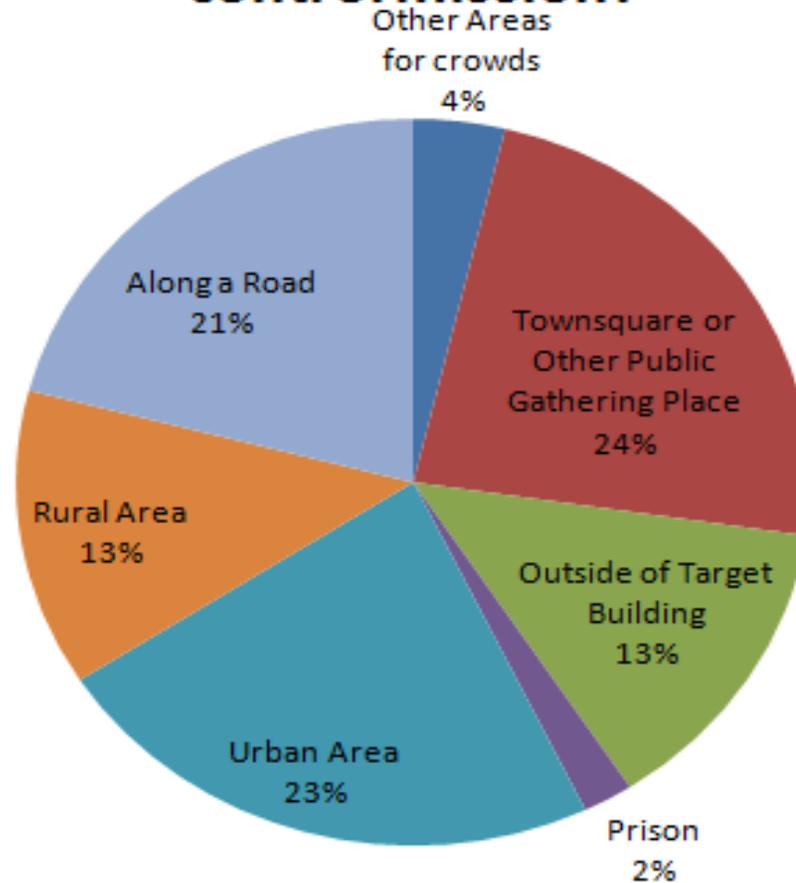
- 70% of respondents included that their unit was involved in crowd control situations during their recent deployment
- As expected, crowd comprised mainly of males
- Crowd specifically involving violence was less common
- Crowds were in expected areas, including gathering places and urban areas, and along roads

Results - Crowd Characterizations



Results – Area Characterization

Usually, in what type of area was the crowd control mission?



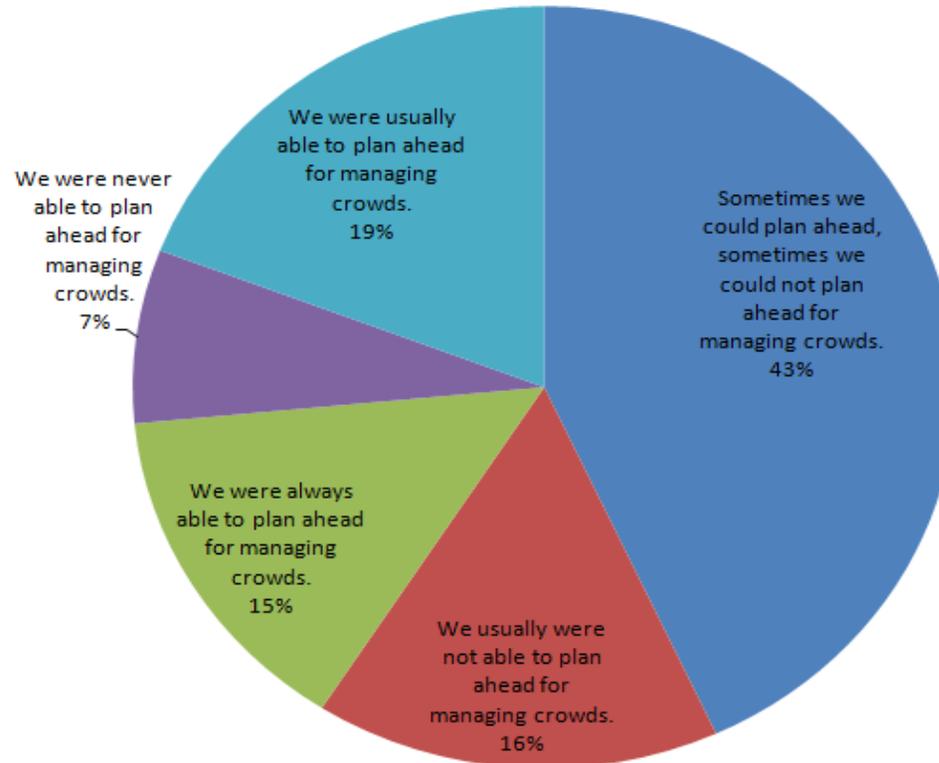
Results

Selected Findings

- **Ability to plan for crowd control**
 - Only 15% said they could plan for the situations
 - 7% could never plan for
 - Rest falling between those extremes

Results – Ability to Plan

In general, were you usually able to have the information to plan ahead for managing crowds and gatherings? Or did crowds just appear?



Selected Findings

- **Crowd management devices and tactics, techniques and procedures**
 - Most frequent response was “show of force”-reported by 62 Soldiers-indicating intimidation was the Soldiers’ primary defense
 - Second most frequent response was “riot gear”-reported by 34 Soldiers
 - Next most frequent responses were tactics related to communication with the crowd including verbal commands, interpreters, bull horns and loudspeakers
 - Followed by denial equipment including barbed wires, barricades, ropes, and cordon/blockers
 - Specific devices mentioned were batons, tear gas, pepper spray, and flares

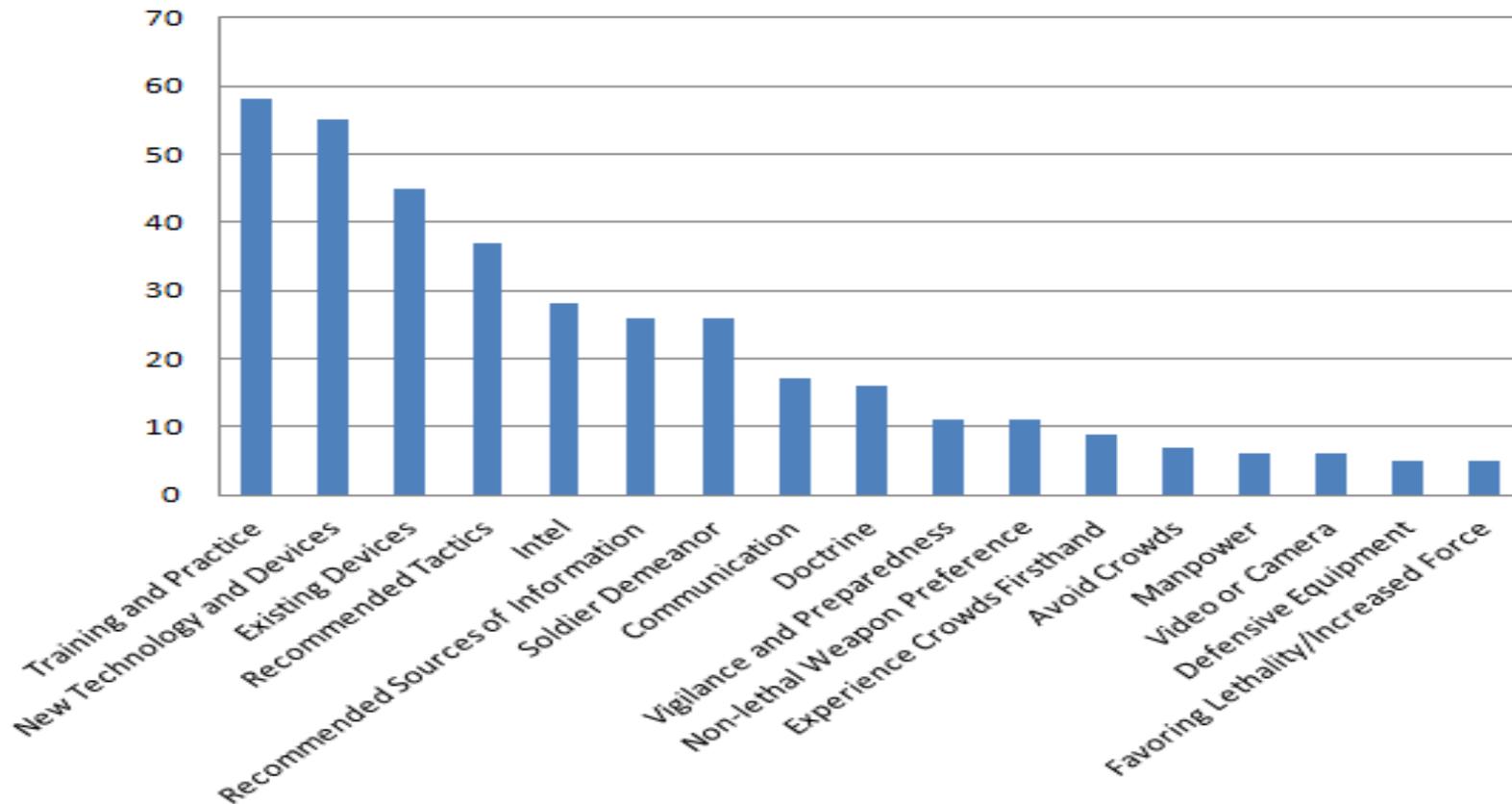
Soldiers Recommendations

• Recommendations to Researchers:

- Most frequent single response was to provide Warfighters the doctrine and training for crowd management
- Several requests for non-injurious, non-lethal weapons
 - To degrade perceptual, visual and motor capabilities
 - Auditory and motoric suppression
 - Soldiers remarked that weapons that appear to have lethal effects were more of a threat to the control force than the crowd
 - Soldiers requested effective, lightweight, quick and simple-to-implement devices
 - Specific non-lethal devices when soldiers are completely surrounded by crowd members

Results

What can you recommend to researchers and developers that would help in managing crowds?



Summary

- Critical data on crowd size provided to focus research efforts on optimization
- Warfighters need for crowd management doctrine and training
- Most common tactics and devices used for the crowd management
- Future devices needed to deal with the specific situation most commonly encountered in dealing with the crowd
- More need for incapacitating and non-injurious devices
- Stressed the importance of understanding motivation, communication, and the interpersonal nature of the crowd-military control force encounter

Questions?

US Army - Target Behavioral Response Lab

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Target Behavioral Response Laboratory MORSS Presentations



- Virtual Employment Test Bed: Operational Research and Systems Analysis to Test Armaments Designs Early in the Life Cycle
- Method and Process for the Creation of modeling and Simulation Tools for Human Crowd Behavior
- Squad Modeling and Simulation for Analysis of Materiel and Personnel Solutions
- The Squad Performance Test Bed
- Crowd Characteristics and Management with Non-Lethal Weapons: A Soldier Survey
- Effectiveness Testing and Evaluation of Non-lethal Weapons for Crowd Management
- Effects of Control Force Number, Threat, And Weapon Type on Crowd Behavior

