



PEO GCS Unmanned Ground Vehicle Overview

Mr. Scott Davis, PEO GCS

23 March 2011



Outline

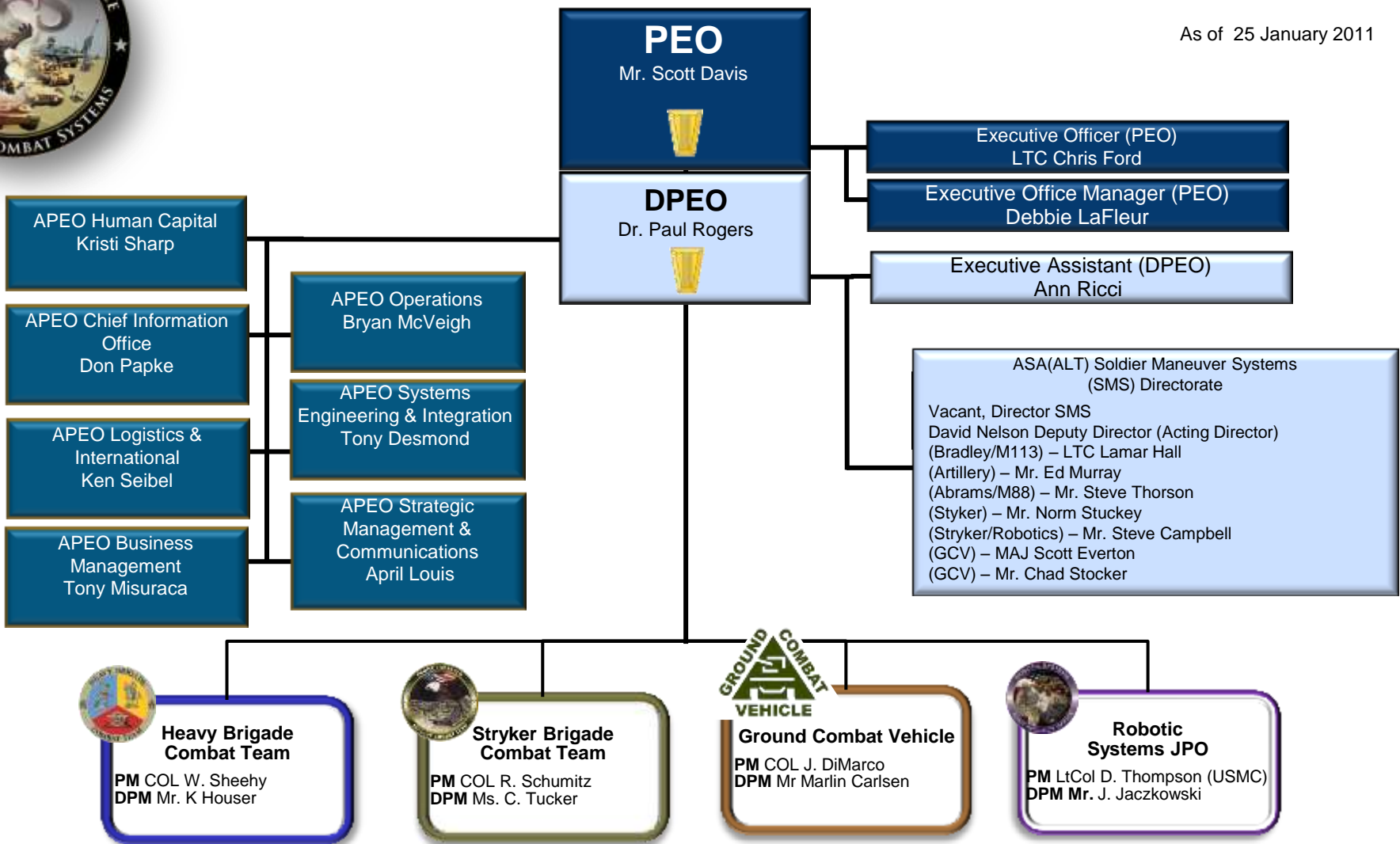
- ◆ Program Executive Office for Ground Combat Systems (PEO-GCS) Overview
- ◆ Strategic Environment
- ◆ PEO-GCS Robotic Systems Currently in Combat
- ◆ Accomplishments and Warfighter Support
- ◆ Developing Systems
- ◆ Emerging Requirements
- ◆ Alignment with ARFORGEN
- ◆ Key Questions/Challenges
- ◆ Way Ahead/Opportunities



PEO Ground Combat Systems

As of 25 January 2011

PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



OUR MISSION IS OUR WARFIGHTERS' FUTURE



Strategic Environment

PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

- **Operational**

- Persistent conflict
- Hybrid threats requiring hybrid solutions
- Advanced/improvised technologies targeted against combat vehicles



- **Army Modernization**

- Interoperability, Commonality, Affordability
- BCT-centric
- Buy fewer, more often
- Incremental fielding of capability thru ARFORGEN



- **Budget**

- Pressure to cut defense & other spending
- Topline base budget expected to have modest, but steady growth
- “Do more without more”



- **Acquisition Reform**

- Increased competition throughout acquisition process
- Reduced tolerance for cost/schedule risk
- Revised Milestone certification reqs

Uncertainty, Complexity, and Constant Change

OUR MISSION IS OUR WARFIGHTERS' FUTURE



Where is the Army going?

Equipment Modernization Imperatives

- **Versatile:**
 - Formations that are tailorable
 - Equipment that is adaptable and capable of growth
- **Networked**
 - Increased situational awareness, force protection, and command and control on the move down to the individual Soldier
- **Affordable**
 - Evolutionary and incremental modernization
 - Balanced investment between current operational needs and future requirements
 - Long-term affordability

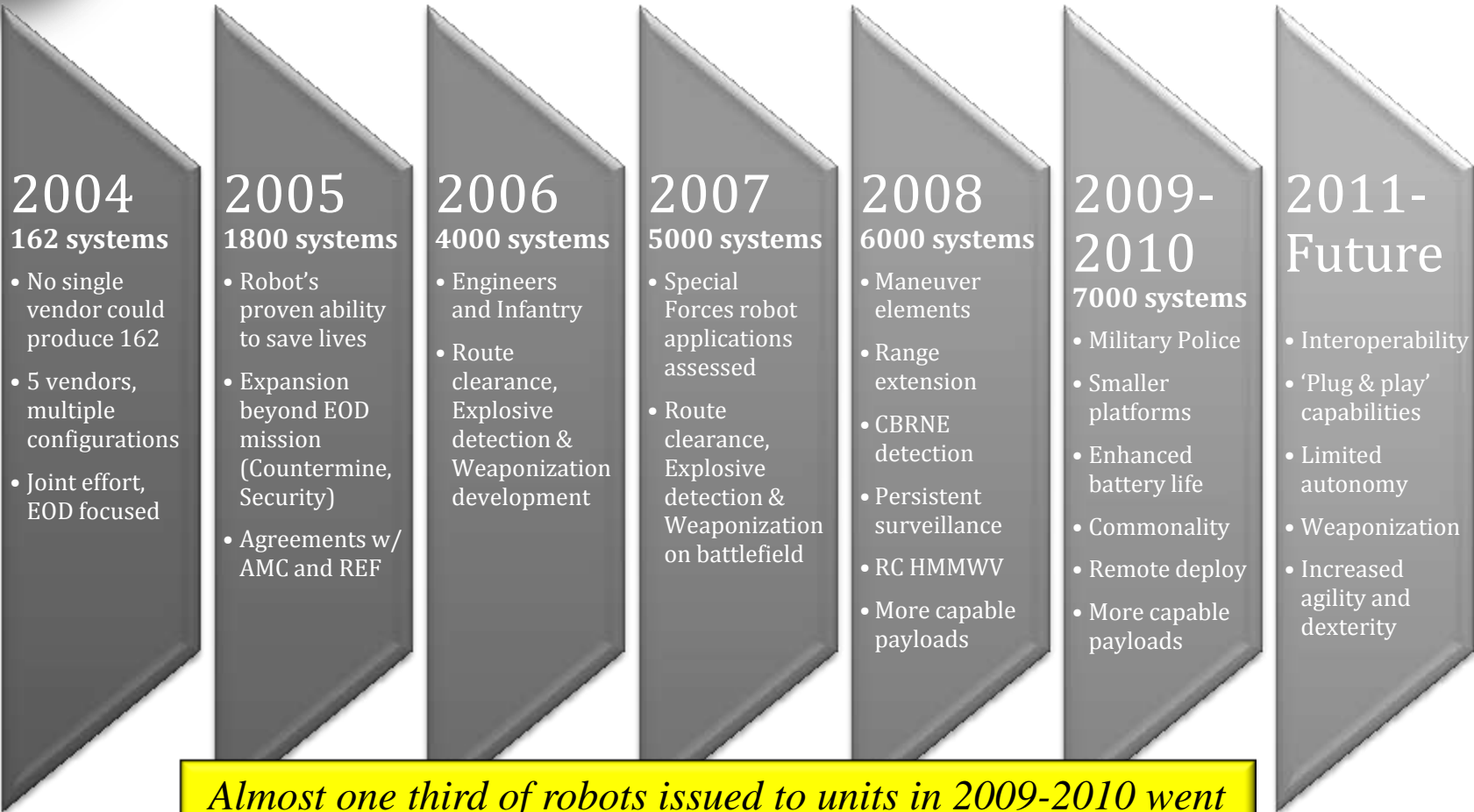
The Army seeks to develop and field a *versatile* and *affordable* mix of equipment to allow Soldiers and units to succeed in full spectrum operations today and tomorrow



Evolution of Ground Robotics in Combat

Sustainment, Modernization, Interoperability and Modularity

PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



Almost one third of robots issued to units in 2009-2010 went to units other than EOD and Combat Engineers.

OUR MISSION IS OUR WARFIGHTERS' FUTURE



PEO-GCS Robots Currently in Combat

Mini-EOD
(SUGV-310) **(260)**



PackBot Family **(1100)**



MARCBot
(350)



TALON Family **(1000)**



M160 **(40)**



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

OUR MISSION IS OUR WARFIGHTERS' FUTURE



PEO-GCS Robots Currently in Combat

◆ Robotic Fleet Management

- ◆ 2700 Robots deployed in theater
- ◆ RS JPO provides support directly to the Warfighter through:
 - ◆ Joint Robotic Repair and Fielding (JRRF) Activity CONUS
 - ◆ Joint Robotic Repair Detachments (JRRDs) OCONUS



OUR MISSION IS OUR WARFIGHTERS' FUTURE



Accomplishments and Warfighter Support

- ◆ Stand-off for interrogation and blow in place
- ◆ Deploy and operate from inside route clearance and other vehicles
- ◆ Entry control points
- ◆ M160 Successes
 - ◆ Adaptations for new uses
 - ◆ Route clearance



OUR MISSION IS OUR WARFIGHTERS' FUTURE

[M160 video](#) →



Funded Systems in Development

Common Mobility Platform (CMP) and Lethal Variants

- ◆ Autonomous Navigation System (ANS) has demonstrated “stand-alone” capabilities – potential to use as common robotic appliqué to enable scaleable autonomy for existing platforms
- ◆ Potential to leverage capabilities for multiple platforms and future Multi-Mission Unmanned Ground Vehicle

Small Unmanned Ground Vehicle (SUGV) XM1216

- ◆ First Unit Equipped will be 3rd Brigade of the 1st Armored Division scheduled in April 2011





Emerging Requirements

- ◆ **Multi-Mission Unmanned Ground Vehicle (MMUGV)**
 - ◆ Over 80% Common with CMP/ANS currently in development
- ◆ **Squad Multi-purpose Equipment Transport (SMET)**
 - ◆ High mobility, semi-autonomous, small-unit equipment transport
 - ◆ Battery recharging
- ◆ **Autonomous Mobility Appliqué System (AMAS)**
 - ◆ Create “optionally-manned” or unmanned systems with current manned vehicles
 - ◆ Common A-kit for scalable autonomy/control





Alignment With ARFORGEN

- ◆ **Forces Command (FORSCOM) Home Station Training Initiative**
 - ◆ Robotic training lanes and repair capabilities at multiple CONUS sites
- ◆ **Training and Doctrine Command**
 - ◆ Institutionalize across DOTMLPF and integrate into force structure
- ◆ **Fielding Through Joint Urgent Operational Needs Statements (JUONSSs), Operational Needs Statements (ONSs) and “10 Liners”**
 - ◆ COTS systems currently in the fight
 - ◆ CDRT process for transition to PORs
 - ◆ Limited success to date
- ◆ **XM1216 Increment 1 Fielding**
 - ◆ Brigade sets 1-3 approved



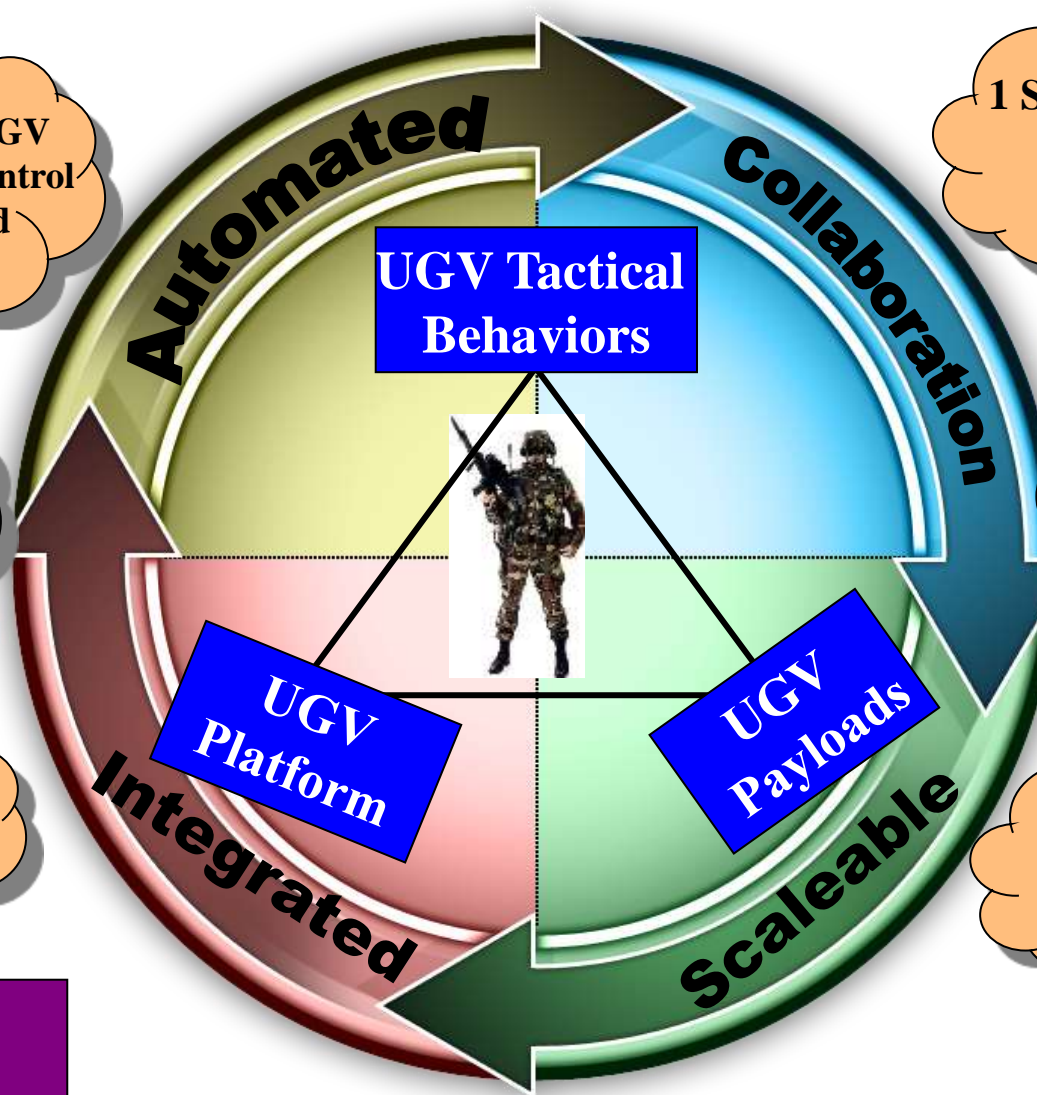
OUR MISSION IS OUR WARFIGHTERS' FUTURE



Unmanned Ground System Modernization Strategy

Modularity, Commonality and Interoperability

PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



1 Soldier to 1 UGV
Teleoperation Control
Some Limited
Autonomy

1 Soldier to Many
UGVs nearly
autonomous

Robots doing dull,
dirty, dangerous
jobs

Robots doing tasks,
Better, faster, safer,
& more efficient

UGVs providing
Standoff
protection

UGV-UAS Teaming
For Full Spectrum
Operations

Today

Future

OUR MISSION IS OUR WARFIGHTERS' FUTURE



Key Questions/Challenges for the Robotics Community

- ◆ **How do we capture and convey the Voice of the Customer?**
 - ◆ Robotics will become ubiquitous across domains
- ◆ **Require a consolidated strategy to drive common solutions**
- ◆ **Resource constrained environment**
 - ◆ Congressional mandate of 1/3 unmanned by 2015
 - ◆ Efficiencies through consolidation
 - ◆ Leverage one time investments across multiple weapon systems
- ◆ **Coordination with automotive industry**
 - ◆ Legal and infrastructure challenges
 - ◆ Economies of scale
- ◆ **Armed robots**
 - ◆ Laws of War, ethical issues, and public perception



OUR MISSION IS OUR WARFIGHTERS' FUTURE



Way Ahead/Opportunities

- ◆ **Interoperability and Commonality goals**
 - ◆ Interoperability profiles – industry participation
 - ◆ Promotes modularity
 - ◆ Promotes competition
 - ◆ Reduces logistics burden
- ◆ **Partnering between Defense and Industry**
 - ◆ NDIA, AUVSI, RTC are all good examples



OUR MISSION IS OUR WARFIGHTERS' FUTURE

**PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS**



OUR MISSION IS OUR WARFIGHTERS' FUTURE