



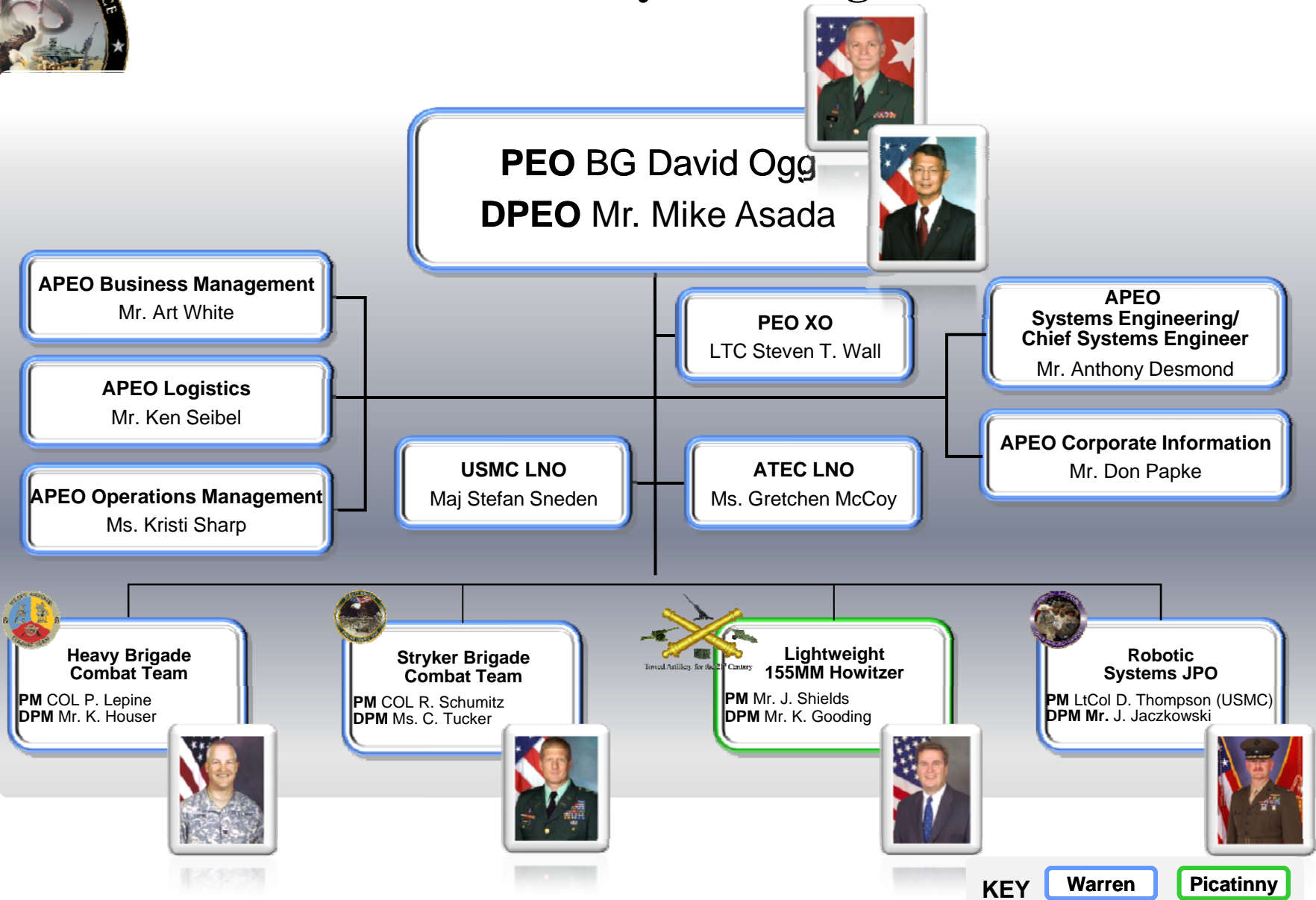
Combat Vehicle Conference

BG David Ogg
13 Oct 2009



**PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS**

PEO Ground Combat Systems Organizational Structure



KEY Warren Picatinny

OUR MISSION IS OUR WARFIGHTERS' FUTURE



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Program Executive Office Ground Combat Systems



Stryker Brigade Combat Team

- Stryker Family of 10 vehicles



Heavy Brigade Combat Team

- Abrams Tank
- M88 Recovery Vehicle
- Bradley Fighting Vehicle
- Paladin / FAASV
- M113
- Knight



Joint Robotic Systems

(Army & Marine)

- X-bot
- MV-4
- TALON
- MARCbot



Towed Artillery for the 21st Century

Joint LW Howitzer 155mm

(Army & Marine)

- M777A2
- M119A2
- M198
- M111 IPADS



Vision:

"Be the premier Acquisition Organization by equipping Joint and Allied Forces with unparalleled lethal and survivable Ground Combat Systems"

Mission:

"Lead the Army's Ground Combat System Programs by providing the Joint Warfighter with mission capable systems as part of a full-spectrum force, through sound life cycle management"

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PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

PEO GCS Portfolio



Robotic Systems JPO

- UA Ground Systems
- Engineer Talon
- Gladiator
- MARCbot
- Packbot
- Assault Breacher Vehicle
- MV- 4 Flail



HBCT

- Abrams Tank
- M88 Recovery Vehicle
- Bradley Fighting Vehicle FOV
- M113 FOV
- Paladin 155mm SP Howitzer/FAASV
- Armored/M707 Knight



Stryker Brigade Combat Team

- Mobile Gun System
- Infantry Carrier Vehicle
- Medical Evacuation Vehicle
- Reconnaissance Vehicle
- Commander's Vehicle
- Engineer Squad Vehicle
- NBC Reconnaissance Vehicle
- Mortar Carrier
- Anti-tank Guided Missile
- Fire Support Vehicle

JLW 155 System

- Lightweight 155mm Towed Howitzer
- 105mm Towed Howitzer
- Improved Position & Azimuth Determining System - IPADS
- 155mm Medium Towed Howitzer
- Gun Laying and Positioning System



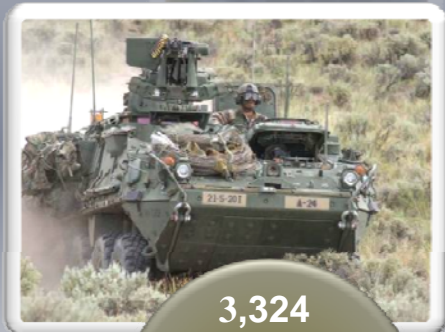
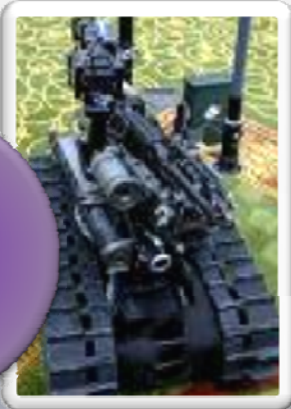
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PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Supporting OCO & ARFORGEN

6,000
Robotic
Platforms



3,324
Stryker
Platforms



6,118
Abrams FoV

In The Fight Today

- 410 Abrams
- 700 Bradleys
- 175 Fire Spt Platforms
- 645 Strykers
- 6000 Robots
- 150 JLW Howitzers



13,441 M113
6,452 Bradley



3,962
Fire Support
Platforms



1,800
Towed
Cannons

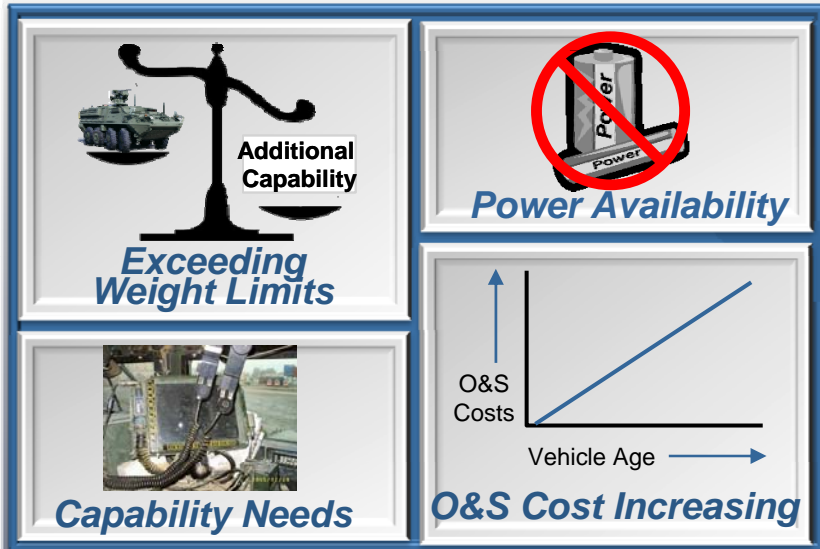
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PEO GCS Modernization Tenets

PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Facing Common Upgrade Challenges



Opportunity for Common solutions

- Minimizing Development Costs
- Commonized Capability Across Fleets
- O&S Cost Benefits
- Increased quantities yielding procurement cost saving



Modernization Synchronized With ARFORGEN



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PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

PEO GCS Modernization Approach

- **Systems Engineering Approach within a Fleet Context**
- **Coordination/Synchronization with other PEOs**
 - Interface development
 - Acquisition Strategy and Programmatic
- **Buy Back SWAP-C**
- **Ensure Sufficient Power, Energy, and Vehicle Electronics Backbone to support Army Modernization**
 - Battle Command and Transport Layer
 - Mission Equipment Packages
 - Vehicle Health Management and Embedded Training
- **Commonality Across the Fleet**
 - Component Level where Possible
 - Architecture level
- **Open Systems Architecture**



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**PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS**

PM Heavy Brigade Combat Team (HBCT)

**Paul R. Lepine
Colonel, Field Artillery
Project Manager**

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Heavy Brigade Combat Team



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



Heavy Brigade Combat Team

PM COL P. Lepine
DPM Mr. K. Houser



Stryker Brigade Combat Team

PM COL R. Schumitz
DPM Ms. C. Tucker



Lightweight 155MM Howitzer

PM Mr. J. Shields
DPM Mr. K. Gooding



Robotic Systems JPO

PM LtCol D. Thompson (USMC)
DPM Mr. J. Jaczkowski



PM Abrams



PM Bradley / M113



PM Fire Support Platforms



PD Mounted Maneuver Foreign Military Sales



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Heavy Brigade Combat Team



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



PM Abrams



M1A2 SEP
(1547)



M1A1 SA
(958)



M88A1 (1035)
M88A2 (607)



M104
(44)



PM Bradley /
M113



M2/3A2
M2/3A2 ODS
(2082)



M2/3A3
(2479)



M113A3
(3515)



M1064A3
(825)



M577A3
(1978)



M1068A3
(1010)



PM Fire Support
Platforms



M109A6
(854)



M992A2
(804)



M3A3 BFIST
(258)



M7 BFIST
(158)



M1200
(490)



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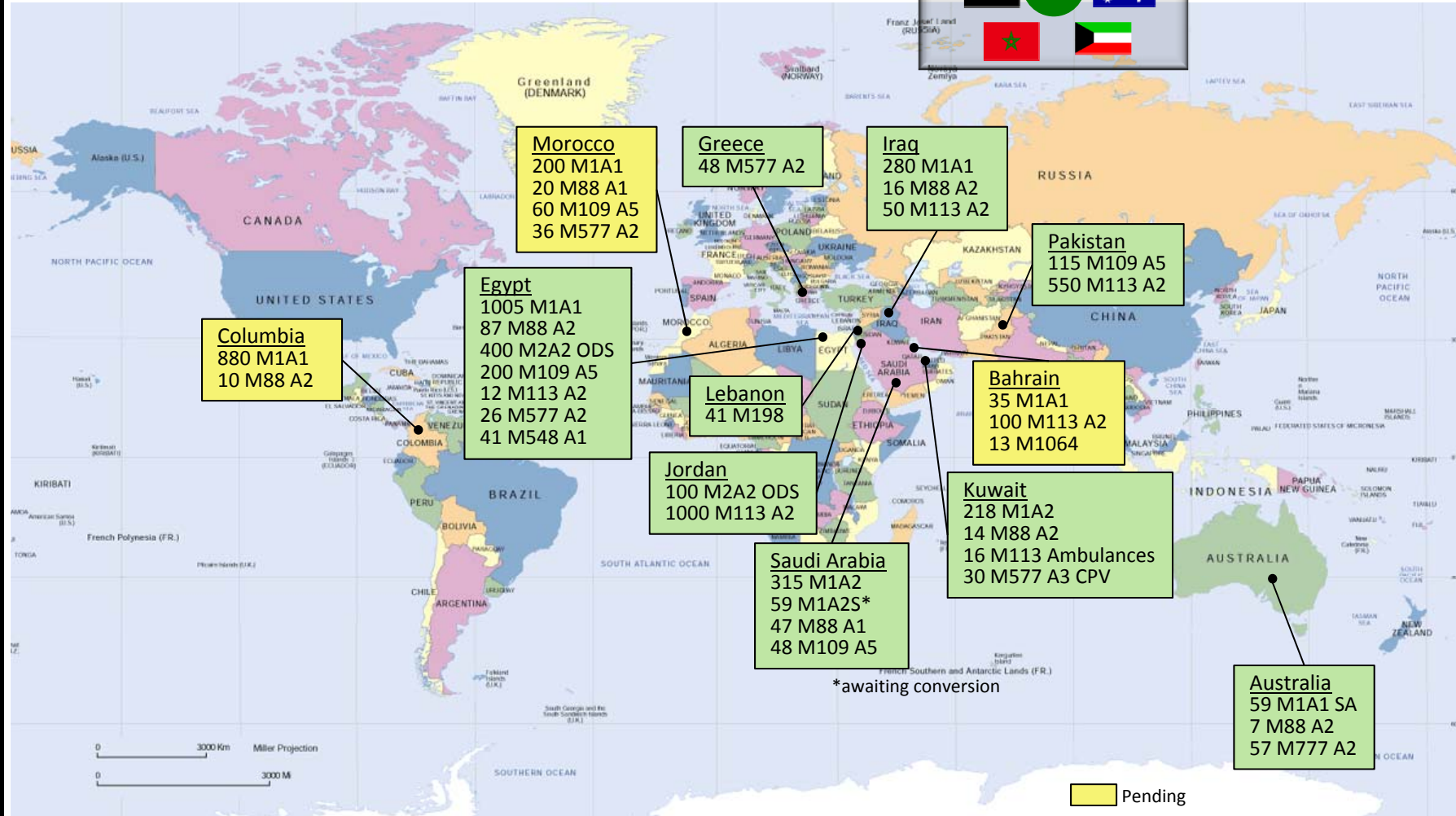


PM HBCT FMS Cases Active and Pending



PD Mounted
Maneuver Foreign
Military Sales

PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



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Abrams Projected Improvements



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Lethality

Improved Combat Identification

Improved Accuracy

Improved Target Recognition

Improved Ammo

Survivability

Improved Fire Suppression System

Improved Ballistic Protection

Improved Situational Awareness

Sustainment

More Reliable Power Train

More Reliable Track and Road-wheels

Embedded Vehicle Health Management System

Improved Silent Watch

Future Battle Command

Improved CBRN System

Improved IED Survivability



Develop an Integrated Fighting System that Will Overmatch Future Threats Across the Full Spectrum Warfare

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PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Bradley Projected Improvements



Increased Lethality
Commander Self
Defense Weapon
Combat Identification

Target Designation
Aided Target
Recognition

Improved Ammo




IED Electronic
Counter Measures
JTRS/ FCS Spinouts
Signature
Management

Improved IED
Survivability
Improved Crew and
Soldier Protection

Improved Rear
Ballistic Protection
External Fire
Suppression

Overhead Wire
Protection
Spotlight

Active Protection
Threat Warning
System

 Lethality
 Sustainment
 Survivability

Improved Vehicle
Health MGT &
Embedded Electronic
Technical Manuals

Environmental
Conditioning

Improved Mobility

Rearward and Side
Looking Vision
Systems

Develop an Integrated Fighting System that Will Complement Across the Full
Spectrum Warfare

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**PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS**

Fire Support Platforms Priorities



PIM
RESET the BFIST, M109 FOV, and Knight
SYNC with ARFORGEN/ARI Alignment

Modularity
CREW Integration
Software Blocking
VHMS Strategy
Modernization

KNIGHT
Execute the Armored Knight

M109 FOV



(Sustainment)
PDFCS Fielding and
Excalibur Integration

BFIST
FS3 Integration on
A3 BFIST



M7 Upgrade to Bradley
ODS-SA Configuration

Acquisition Strategy to
Field 531 Systems
Targeting Under Armor and
on the Move



Our #1 Priority is to Support Units Engaged in
Overseas Contingency Operation (OCO)
and those Units Preparing to Deploy

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Paladin/FAASV Integrated Management (PIM)



• Program Objectives

- Replace Obsolete Components
- Ensure Long Term Sustainment
- Reduce Log Footprint
- Reduce Operations & Support Costs
- Regain Mobility

• Maintain a 10-12 yr Fleet Age

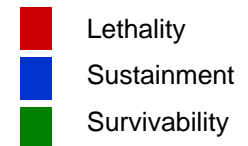
- Improvements to power train, power management, rammer, slip ring, hydraulics, suspension and fire control
- New chassis for Paladin and FAASV
- Crew Survivability

• Vehicle Health Management System (VHMS),

• Common Modular Power System (CMPS)

• Address Obsolescence and Sustainment Issues

- Leverage Bradley Fleet Commonality
- Bradley Engine/Transmission/Final Drives/Track/Suspension
- NLOS-C Electric Drive and Rammer





PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Robotic Systems Joint Project Office (RS JPO)

David C. Thompson
LtCol, USMC
Project Manager

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Robotic Systems Joint Program Office



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



**Heavy Brigade
Combat Team**

PM COL P. Lepine
DPM Mr. K. Houser



**Stryker Brigade
Combat Team**

PM COL R. Schumitz
DPM Ms. C. Tucker



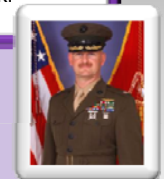
**Lightweight
155MM Howitzer**

PM Mr. J. Shields
DPM Mr. K. Gooding



**Robotic
Systems JPO**

PM LtCol D. Thompson (USMC)
DPM Mr. J. Jaczkowski



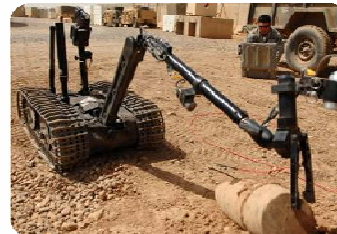
X-bot



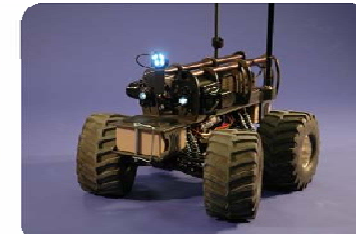
MV-4



TALON



MARCBot



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Robotic Systems Portfolio



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Maneuver



- IED Defeat Systems
- Disarm / Disrupt
- Reconnaissance
- Investigation
- Explosive Sniffer

Maneuver Support



- Area/Route Clearance
- Mine Neutralization
- Counter IED
- CBRNE

Sustainment



- Common Robotic Kit
- EOD
- Convoy
- Log/Resupply

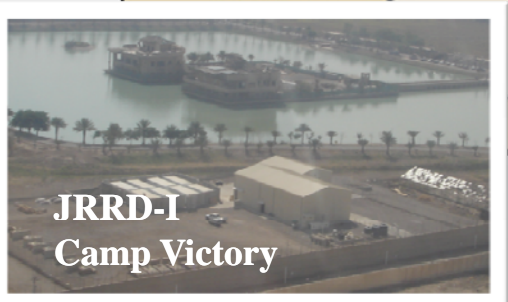
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PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

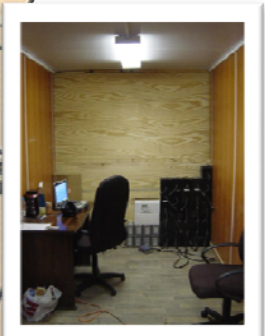
RS JPO Joint Robotic Repair and Fielding Activities in OIF/OEF

- Iraq
- 13 Soldiers/Marines
 - 8 civilians
 - 1700+ robots



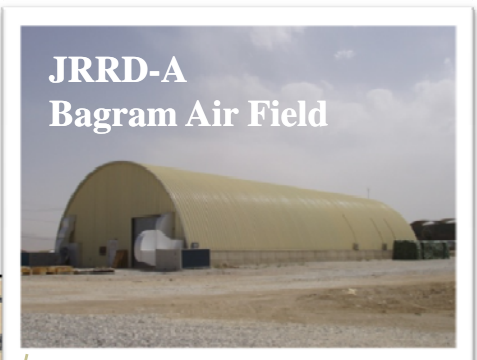
JRRD-I
Camp Victory

- Afghanistan
- 11 Soldiers/Marines
 - 1 civilian
 - 800+ robots



Kandahar Air Field

Camp Leatherneck



JRRD-A
Bagram Air Field

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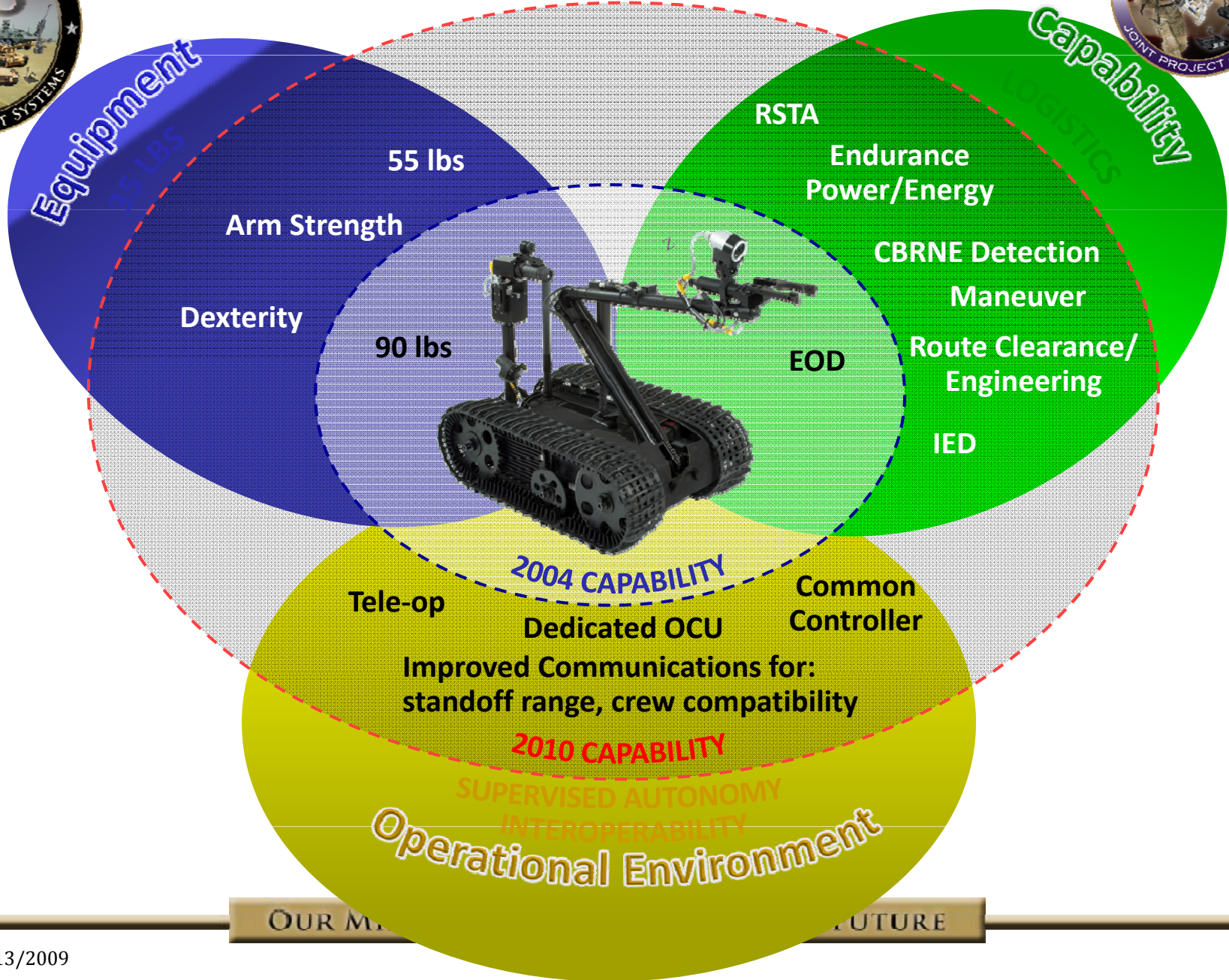
Material Enterprise Challenges & Opportunities

- **Establish a concerted materiel enterprise strategy that balances both current and future requirements**
- **Deliver fully integrated ALT capabilities to the Joint Warfighter**
 - AMC empowered RS JPO with theater sustainment of ground robots: Joint Robotic Repair and Fielding Activity
 - Partnered with RDECOM and other Service labs for appropriate technical expertise (ie. TARDEC for vehicle integration, ARDEC for weapons)
- **Must account for the sustainment and modernization of the current force, spinouts and other technology transfers to the current force and BCTs**
- **Two add'l issue/challenges:**
 - No centralized robotics strategy/disparate pots of resources
 - Configuration Management – multiple organizations “touch” robots



Robotic Modernization

PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



OUR M... FUTURE



Family of Robotic Systems Payload Integration and Interoperability

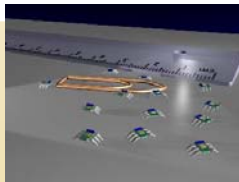


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GROUND COMBAT SYSTEMS

Common payload interface across platforms by mission or class

Family of unmanned ground systems

MISSION EQUIPMENT PAYLOADS



Payload Interface Standard Architecture

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**PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS**

PM Stryker Brigade Combat Team (SBCT)

**Robert W. Schumitz
Colonel, IN
Project Manager**

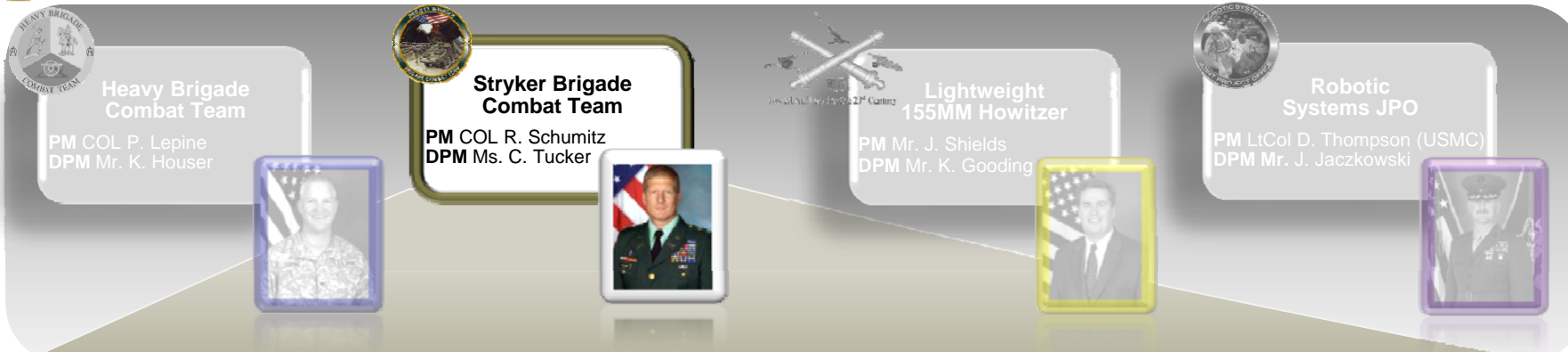
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Stryker Brigade Combat Team (Family of Vehicles)



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



NBCRV 	ATGM 	MEV 	ESV 	FSV 
ICV 	RV 	MGS 	MCV 	CV 

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PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Stryker Family of Vehicles



M1126
Infantry Carrier Vehicle (ICV) - 130



M1135
NBC Reconnaissance Vehicle (NBCRV) - 3



M1134
Anti Tank Guided Missile (ATGM) - 10



M1127
Reconnaissance Vehicle (RV) - 52



M1133
Medical Evacuation Vehicle (MEV) - 16



M1128
Mobile Gun System (MGS) - 29



M1132
Engineer Squad Vehicle (ESV) - 13



M1129
120mm Mounted Mortar Carrier (MCV) - 37



M1130
Commander's Vehicle (CV) - 28



M1131
Fire Support Vehicle (FSV) - 14

Commonality
Common Operating Picture
Common Chassis & Drive Train
Common KPP's
Common Survivability
Common TMDE, Spare Parts, Tools & Skills

Bottom Line
Stryker provides enhanced, Battle-proven capabilities to warfighters
Over 25 million miles in Combat
Currently on 11th SBCT Deployment

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Deployment History and Future CY2003 – CY2010



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

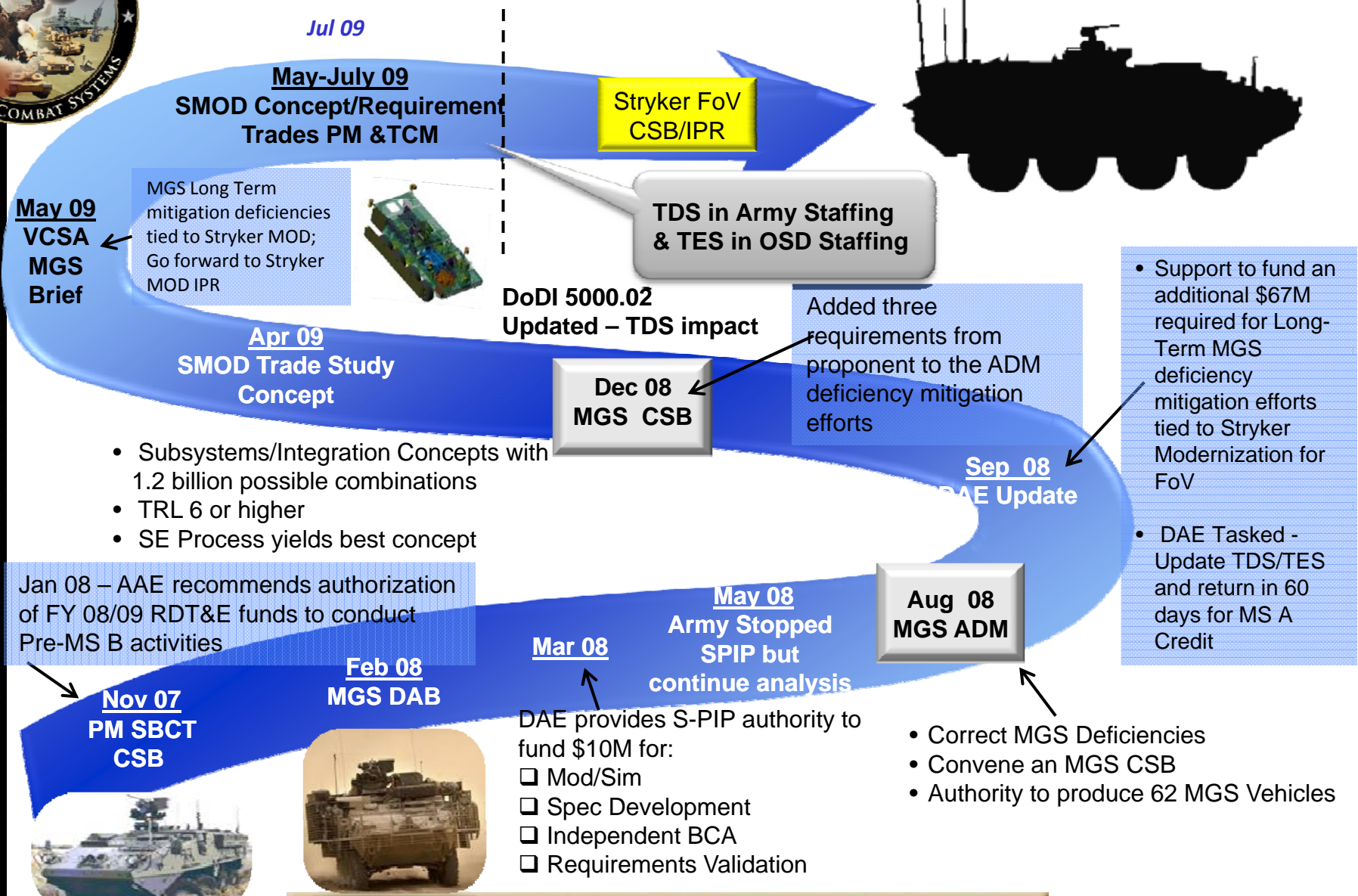
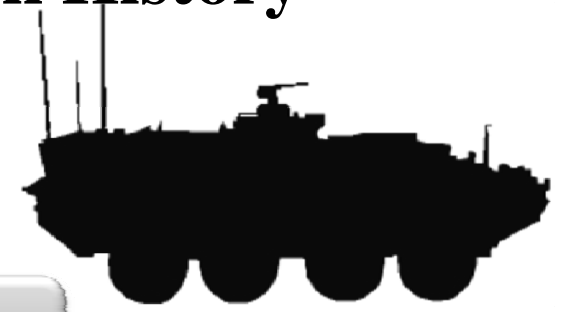
Unit	CY 2003				CY 2004				CY 2005				CY 2006				CY 2007				CY 2008				CY 2009				CY 2010					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
1st Bde (3/2 - FLW) Vehs SBE for follow on Bde					Deployment Nov 03 - Oct 04				OIF					Deployment Aug 06 - Sep 07				OIF									Deployment Aug 09 - Aug 10				OIF			
2nd Bde (1/25-FLW/2SCR- GE)									Deployment Sep 04 - Oct 05				OIF					Deployment Aug 07 - Oct 08				OIF									Avail			
3rd Bde (172 - AK/1/25 -AK)													Deployment Aug 05 - Nov 06				OIF					Deployment Oct 08 - Oct 09				OIF								
4th Bde (2SCR - FLW/4-2 - FLW)																	Deployment May 07 - Jun 08				OIF					Deployment Sep 09 - Sep 10				OIF				
5th Bde (2/25 - HI)																	Deployment Dec 07 - Feb 09				OIF									Avail				
6th Bde (56th PANG - PA)																					Deployment Feb - Sep09				OIF									
7th Bde (5/2-2/2 - FLW) Vehs SBE for follow on Bde																									Deployment Jul 09 - Jul 10				OEF					

Year (CY)	CY03	CY04	CY05	CY06	CY07	CY08	CY09	CY10
Average Miles Per Year	0.5 M	3.3 M	3.1 M	3.8 M	4.4 M	4.5 M	TBD	
Average Number of Stryker Vehicles	330	330	330	330	495	825	910	910
Average Number of Soldiers in Stryker Vehicles	2,310	2,310	2,310	2,310	3,465	5,575	6,370	6,370

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Stryker FoV Modernization History





Stryker Constraints



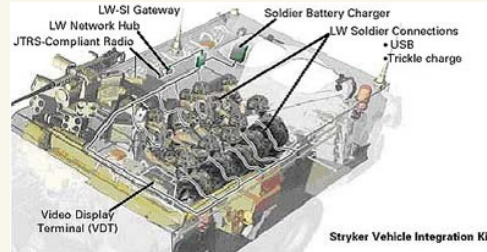
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GROUND COMBAT SYSTEMS

SPACE



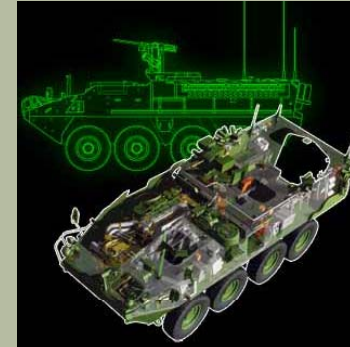
- Multiple Appliqué solutions added “Scaleable / Kitable Concept” limited
- Kits create both interior & exterior challenges for each carrier variant
 - CREW, GSS/MSS, Armor Upgrades
 - Additional displays/screens
 - 2nd/3rd order effects include weight and power
- Egress

WEIGHT



- Kits required to address threats
 - IED, RPG, EFP, Sniper, etc
- Only select Kits can be applied
- Deployed configuration weighs more than planned
 - ICV by ~11,000 lbs
 - MGS by ~9,000 lbs
- Safety Speed limits apply over 41,000lbs

POWER



- OIF kit loads require some systems to be turned off
- Current Power Generation cannot meet expected future loads
- Silent watch capability impacted
- Excess heat impacts both onboard electronics and Soldiers effectiveness

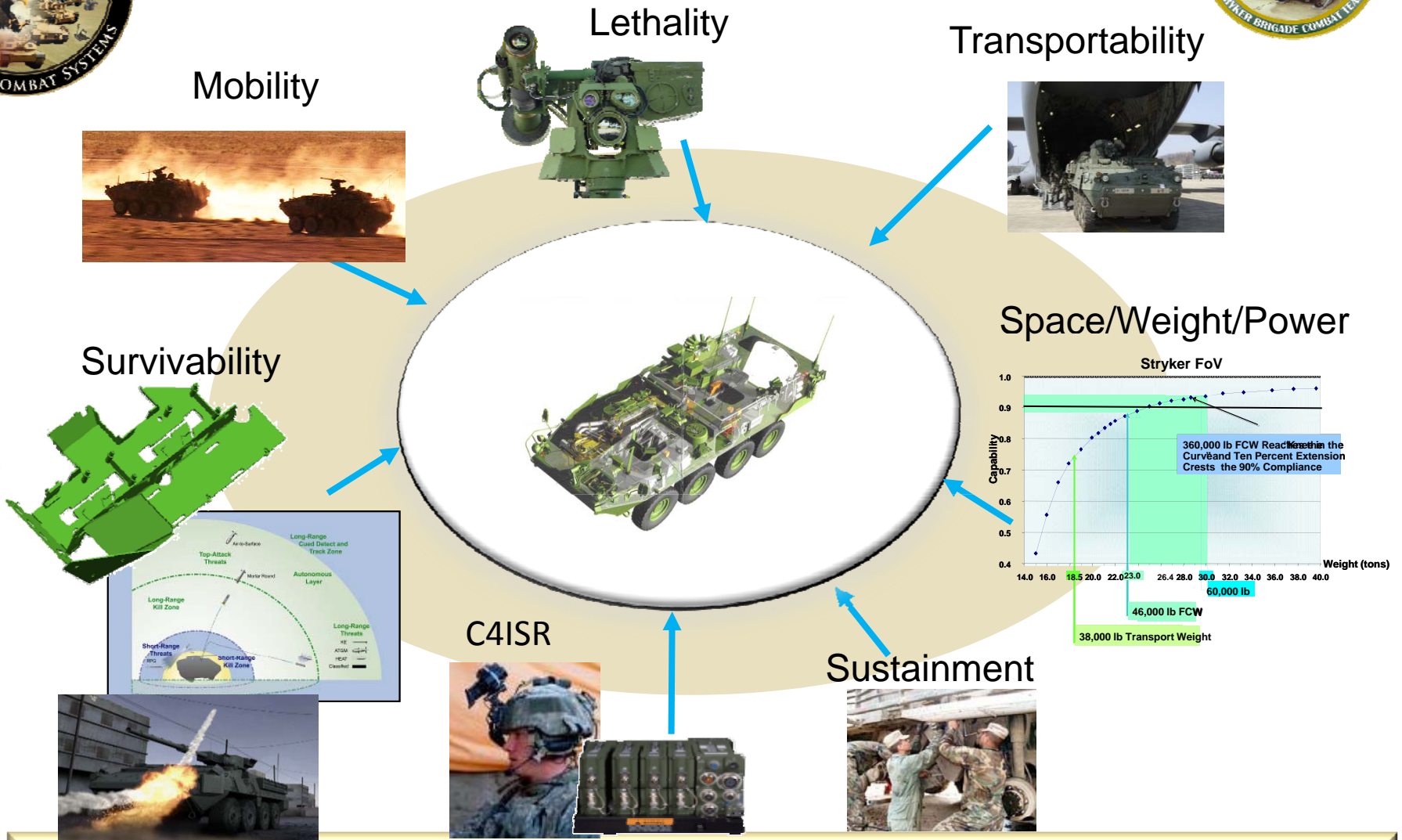
Current Space, Power and Suspension Capacity Shortfalls require Plans for Future Growth

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GROUND COMBAT SYSTEMS

Balancing Capabilities Stryker Modernization (S-Mod) Systems Engineering Process



Comprehensive System Design results in Balanced Technical Approach

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Combat Vehicle Conference



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

Backup Slides

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PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS

M1200 Armored Knight Program



- The M1200 Armored Knight provides Combat Observation Lasing Teams (Colts) with a highly survivable platform for the battlefield

- Targeting Under Armor/On the Move effort underway to increase survivability of targeting station operator and lethality of self-defense weapon

- 135 – Armored Knights fielded through September 2009

- Ongoing ECP's/MWOs address increased survivability

- Lethality
- Sustainment
- Survivability

Modularity End State is 490

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BFIST Program Overview



- **Targeting Under Armor/On the Move effort underway to increase survivability of targeting station operator and lethality of self-defense weapon**

- **BFIST SA Project**

- Modified to align with the Bradley ODS-SA Project
- Vehicle will be similar to an A3 BFIST without the CIV

- **Bradley Urban Survivability Kits II (BUSK II) applicable to BFIST**

- New FSSO seat testing accomplished successfully Jun 09
- Chillers scheduled for delivery to AO Dec 09

- **Bradley BFIST Desktop Trainers (BBDT)**

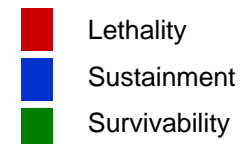
- Changes to improve the soldier's training experience are being finalized for delivery Sep 09.

- **FS3 integration on A3 BFIST**

- Government testing started Jun 09
- Limited User Testing scheduled Jan-Feb 2010

- **Under Bradley Reman and Reset, Fielding of BFIST vehicles continue to meet ARFORGEN**

- Support to Bradley reliability improvements to quickly correct Mission Critical failures
- System / MEP obsolescence and upgrade efforts cut into production and fielding

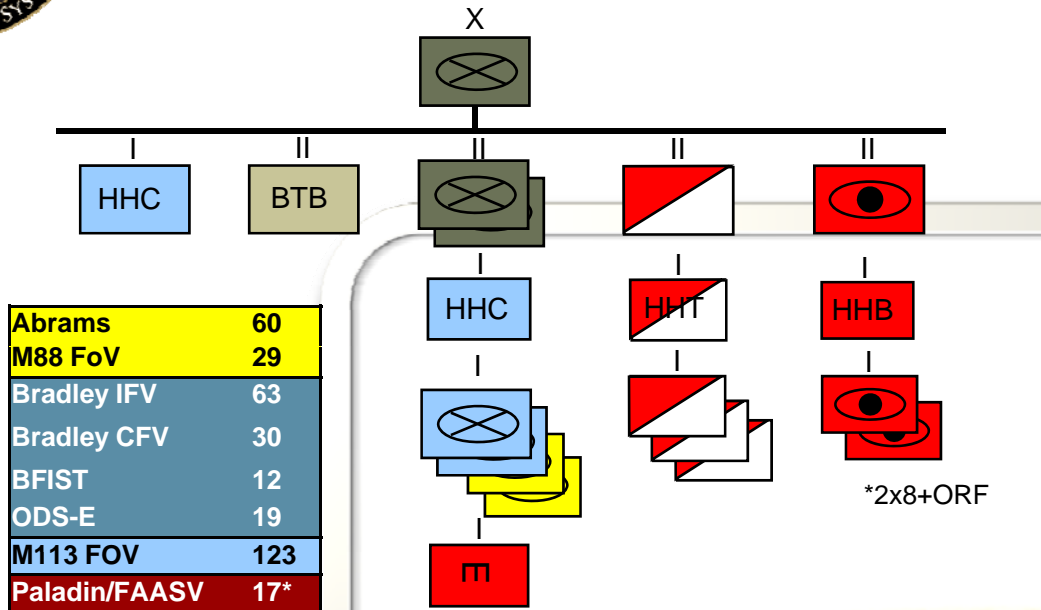




Heavy Brigade Combat Team Formation



PROGRAM EXECUTIVE OFFICE
GROUND COMBAT SYSTEMS



Abrams	60
M88 FoV	29
Bradley IFV	63
Bradley CFV	30
BFIST	12
ODS-E	19
M113 FOV	123
Paladin/FAASV	17*

19 Active Component
7 Reserve Component
3 Army Prepositioned Stock
2 Equipping Force Pool

31 Total HBCTs



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