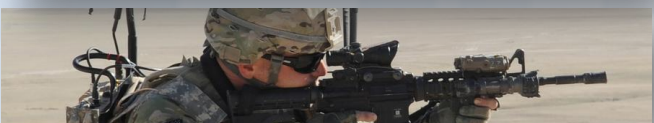


Army Science & Technology



NDIA Science Engineering & Technology Conference

Lethality Portfolio Overview



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Office of the Deputy Assistant Secretary
of the Army for Research and Technology

9 April 2014

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DESIGN • DEVELOP • DELIVER • DOMINATE
SOLDIERS AS THE DECISIVE EDGE



Army Enduring Challenges

➤ Greater **force protection (Soldier, vehicle, base)** to ensure survivability across all operations

- Ease **overburdened** Soldiers in Small Units
- Timely **mission command & tactical intelligence** to provide situation awareness and communications in all environments
- Reduce logistic burden of **storing, transporting, distributing** and **retrograde** of materials

➤ Create **operational overmatch** (enhanced lethality and accuracy)

- Achieve operational **maneuverability** in all environments and at **high operational tempo**
- Enable ability to **operate in CBRNE environment**
- Enable **early detection and improved outcomes for Traumatic Brain Injury (TBI) and Post Traumatic Stress Disorder (PTSD)**
- Improve **operational energy**
- Improve **individual & team training**

➤ **Reduce lifecycle cost** of future Army capabilities



Army S&T Investments by Portfolio

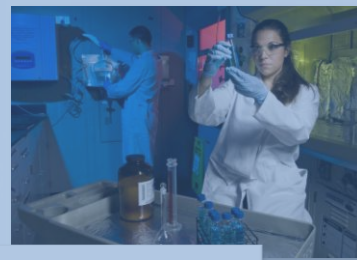
PB15 FY15 6.1-6.3



Soldier/Squad
 Soldier survivability equipment;
 human dimension/systems; power &
 energy; Soldier Weapons, training



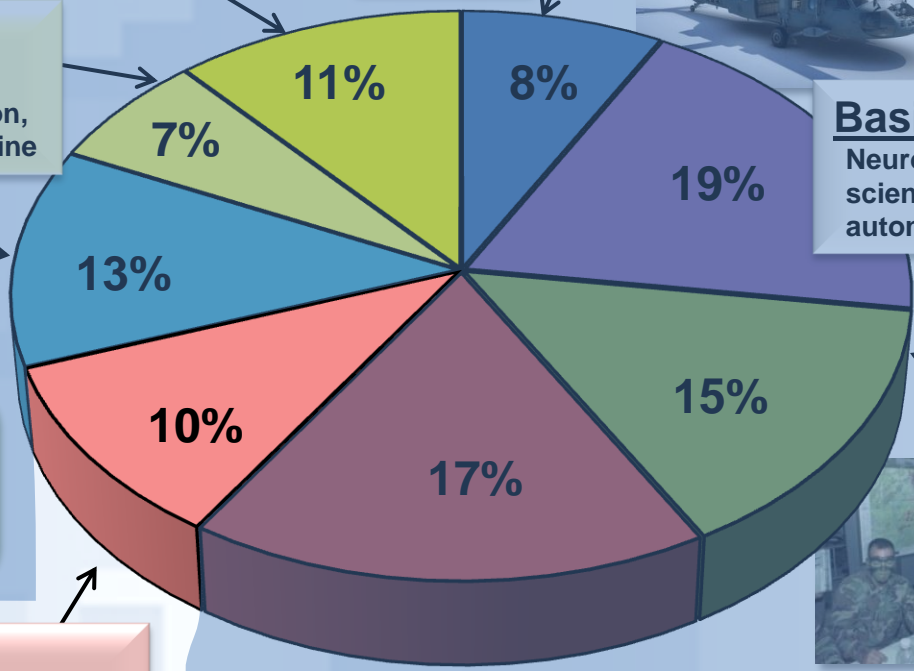
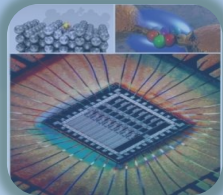
Air
 Advanced air vehicles;
 unmanned aerial systems;
 manned/unmanned teaming



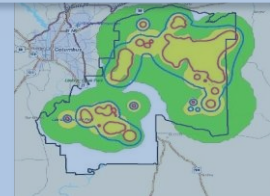
Basic Research
 Neuroscience; network
 science, materials science;
 autonomy

Medical
 Combat Casualty Care,
 Infectious Disease mitigation,
 clinical/rehabilitative medicine

Innovation Enablers
 High Performance Computing;
 Environmental Protection;
 Base Protection; Studies



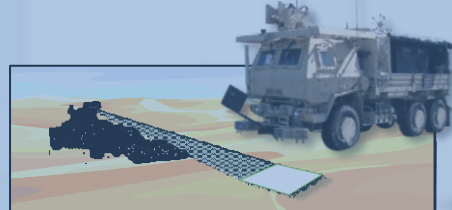
C3I
 Secure Comms-on-the-
 move; cyber/EW; sensors



Lethality
 Offensive/Defensive kinetic
 (guns, missiles) > 50 cal;
 Directed Energy (HEL) weapons



Ground Maneuver
 Combat/tactical ground
 platforms/survivability;
 unmanned ground systems;
 austere entry; power & energy



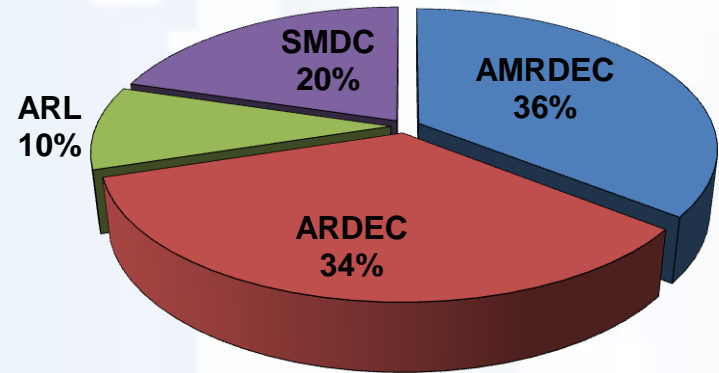
Note: Figures may not add due to rounding

MAINTAINING A LEADING EDGE IN TECHNOLOGY



Lethality Portfolio 6.2 and 6.3 Funding

\$230M



Air Defense

\$36M

Investment Areas

- Counter UAS/CM
- Counter RAM

Fire Support

\$32M

Investment Areas

- Artillery
- Rockets
- Mortars

Close Combat

\$34M

Investment Areas

- Shoulder Launched Weapons
- Ground Vehicle Weapons
- Air Launched Weapons

Directed Energy

\$51M

Investment Areas

- High Energy Laser
- High Power Radio Frequency

Weapons Enablers

\$77M

Investment Areas

- Energetic Materials
- Warheads
- Propulsion
- Guidance
- Seekers





Lethality Portfolio Vision/Mission Statement

Vision

U.S. Overmatch in weapons for offensive and defensive capabilities

Mission Goals

- **Affordability**
- **Increase Range**
- **Precision in All Environments**
- **Scalable Effects**



Affordable Extended Range Precision Technologies for Current and Future Weapon Systems



Lethality S&T Strategy

Goal: To achieve overmatch lethality at extended ranges with precise and affordable weapons

Key Research Areas

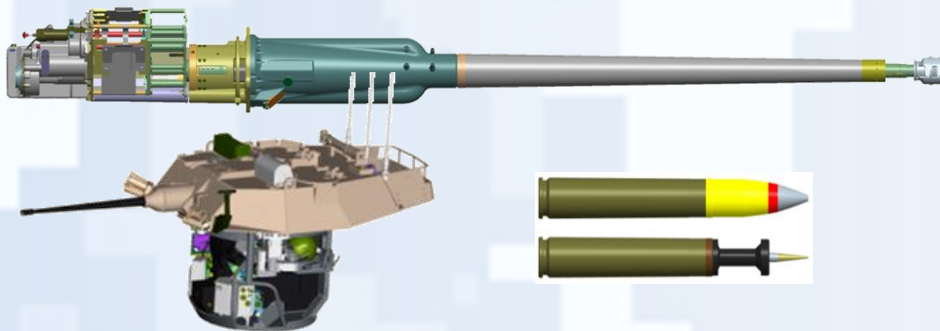
- Energetics, Propulsion and Warheads for increased range and decisive effects
- Guidance for improved precision and GPS-denied precision
- Directed Energy Weapons
- Affordable component technologies to address weapon cost drivers
- Seeker technologies to defeat moving targets and air defense threats



**Disruptive Energetics:
40mm Grenade with 155mm Round Effects**

Drivers

- CSA Strategic Priorities
- Army Strategic Planning Guidance
- Army Enduring Challenges
- Air & Missile Defense Strategy
- Army Capabilities Needs Analysis (CNA 16-20)



**Improved accuracy and increased range for
medium caliber weapon systems**

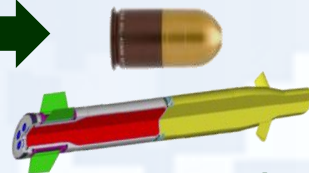
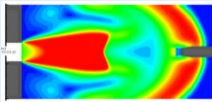
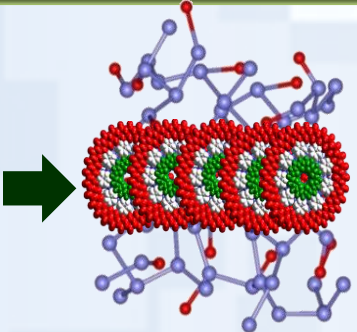
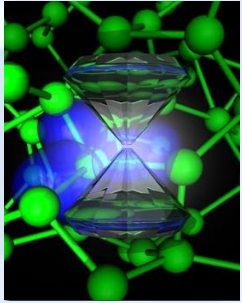




Lethality Major Efforts

Disruptive Energetics

Goal: Provide 3-10x yield in Energetics leading to game changing leaps in weapons effects and range. These improvements could double the range of rockets and artillery, or provide 40mm grenades the explosive force of a 155mm Artillery round

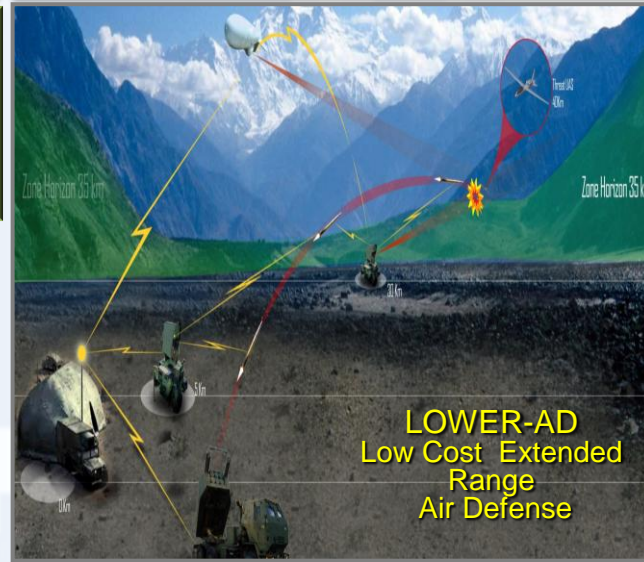


New Formulations

Disruptive Energetics

Novel Propulsion

Counter UAS/Cruise Missile



LOWER-AD
Low Cost Extended
Range
Air Defense

Goal: Design, develop and demonstrate next generation seeker, propulsion and warhead technologies to provide defeat of unmanned aircraft and cruise missiles at extended ranges.

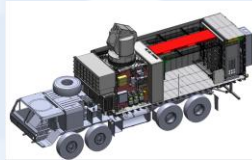
Solid State High Energy Laser Technology Demonstration

Goal: Develop and demonstrate a tactical Solid State High Energy Laser platform focusing on key technologies including: Clearance of Fires, Laser, Beam Control, Adaptive Optics, Pulse Power, Thermal Management, and Fire Control. Incremental approach to demonstrating 10kW, high efficiency 50kW, 100kW lasers in a tactical platform, then demonstrating Integrated Fire Protection Capability (IFPC-2) AoA performance standards.

Testing to demonstrate HEL Lethality at WSMR



Mobile Demonstrator for Subsystem Ruggedization & Integration



Phased Demonstrations



MAINTAINING A LEADING EDGE IN TECHNOLOGY

Lethality Major Efforts

Long Range Fires – Rockets

Pulse Rocket Motor



Composite Case Technology

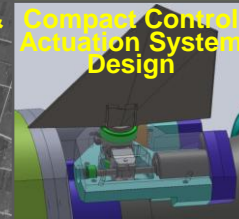


Goal: Provide affordable missile components that enable long range fires with warhead effects for point and area targets that maintain precision in a GPS-denied environment

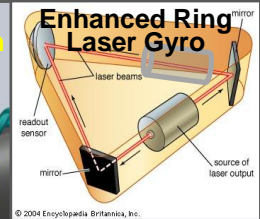
Terrain Matching & Image Gyro



Compact Control Actuation System Design



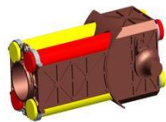
Enhanced Ring Laser Gyro



Long Range Fires – Artillery

Goal: Provide range extension, weight reduction, accuracy improvement, and improved rates of fire for 155mm artillery

Advanced Lightweight weapon system



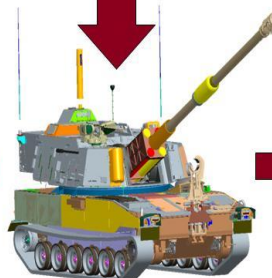
Extended Range Projectile Family



Novel Propellant Charges



Self-propelled



Fire Control

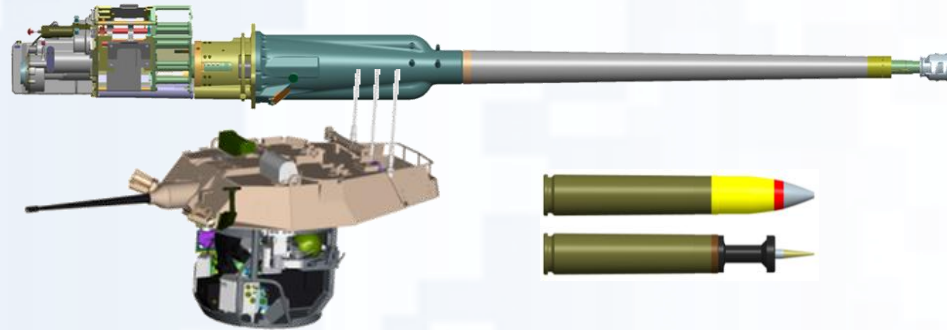


Towed

Ammo Logistics

Medium Caliber Weapons

Goal: Demonstrate a more accurate and lethal medium caliber weapon system and ammunition for extended range engagements



Improved accuracy and increased range for medium caliber weapon systems



Summary

- Portfolio supports the current and future weapons
- Major Efforts:
 - Long Range Fires
 - Counter RAM/UAS
 - Solid State High Energy Lasers
 - Guidance in GPS Denied Environments
 - Propulsion, Warhead and Seeker Research
- For Business Opportunities, see the following Organizations:
 - Aviation and Missile Research Development and Engineering Center (AMRDEC)
 - <http://www.amrdec.army.mil/amrdec/DoingBusinessWith/SBIR.aspx>
 - Armaments Research Development and Engineering Center (ARDEC)
 - <https://www.pica.army.mil/TechTran/policy/>
 - Space and Missile Defense Command (SMDC)
 - <http://www.smdc.army.mil/2008/BusinessOpportunities.asp>
 - Army Research Laboratory (ARL)
 - <http://www.arl.army.mil/www/default.cfm?page=6>



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CONNECTING INDUSTRY & DoD

The Defense Innovation Marketplace is a centralized resource for market research:

For Industry, to learn about Department of Defense (DoD) S&T/R&D investment priorities, capability needs and technology interchanges.

For Government, to [access search tools](#) to assess and then leverage industry IR&D projects for current and future programs.

"We also have the Defense Marketplace, which is a website that we allow industry to identify IR&D opportunities... that we can then leverage."
Mary Miller, Deputy Assistant Secretary of the Army for Research & Technology

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USMC Expeditionary Forces 21
This document provides guidance for how the Marine Corps will be postured, organized, trained, and equipped to fulfill assigned public law and national policy responsibilities.

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DoD Info for Business & Program Planning
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DoD employee access of IR&D Search tool

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Strategic Documents	Doing Business with DoD	News & Events
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