Science and Technology (S&T) Overview

Jeffrey D. Singleton
(A) Executive Director for Technology

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

18 May 2015

Army S&T Principles

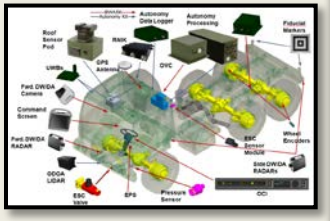
MISSION: ***Identify, develop and demonstrate technology options that inform and enable effective and affordable capabilities for the Soldier***

VISION: ***Providing Soldiers with the technology to Win***

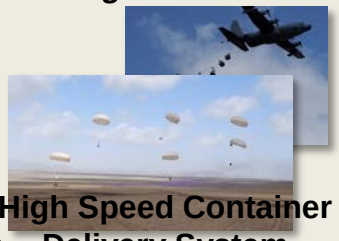
Current Force

Deployable Force Protection Adaptive Red Team

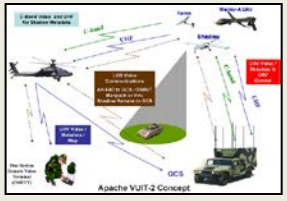
Advanced Rotary Wing Aerial Delivery Sling Load Net



Autonomous Mobility Appliqué System



High Speed Container Delivery System

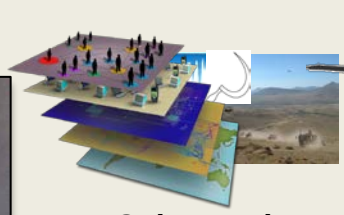


Video from Unmanned Aerial Systems

Enabling the Future Force

Enhancing the Current Force

Future Force



Cyber tools

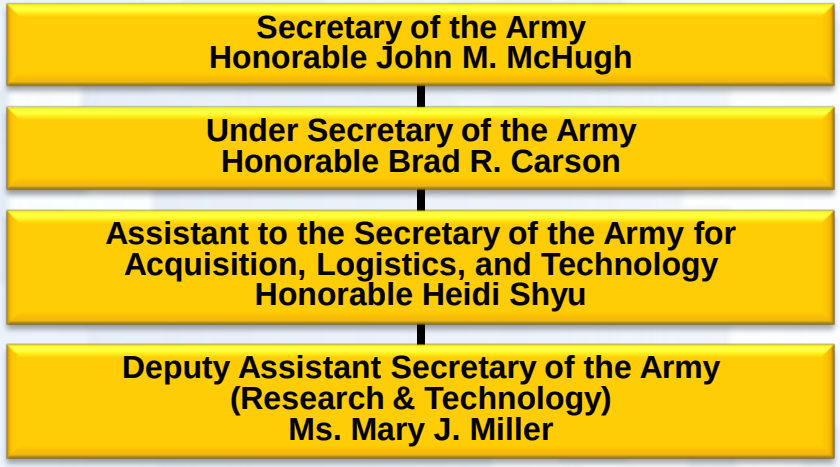
Next Generation Rotorcraft

Neuroscience

High Energy Lasers

Occupant Centric Platform

Army S&T Enterprise



* Percent of S&T core program executed, PB15

74%*	8%*	13%*	3%*	2%*
Army Materiel Command	U.S. Army Medical Command	U.S. Army Corps of Engineers	U.S. Army Space & Missile Defense Command	HQDA, G-1 Personnel
Research, Development & Engineering Command	Army Medical Research & Materiel Command	Engineer Research & Development Center	Space & Missile Defense Command Technical Center	U.S. Army Research Institute for the Behavioral and Social Sciences
Army Research Laboratory; Research, Development & Engineering Centers	Laboratories	Laboratories		

Army S&T Enterprise—Research, Development & Engineering Centers & Labs

- U.S. Army Materiel Command
- U.S. Army Medical Command
- U.S. Army Corps of Engineers
- U.S. Army Space and Missile Defense Command
- Headquarters, Department of the Army, G-1

Tank Automotive RDEC

Cold Regions Research & Engineering Lab

Natick Soldier RDEC

Research Inst. of Environmental Medicine

Communications -Electronics RDEC

Armament RDEC

Construction Engineering Research Lab

Research Inst. of Chemical Defense

AMRDEC - Army Aeroflightdynamics Directorate

RDECOM HQ

Research Inst. of Infectious Disease

Army Research Institute for the Behavioral & Social Sciences

Walter Reed Army Inst. of Research

Edgewood Chem Bio Center

ARL - Battlefield Environments and Survivability Elements

Army Research Lab (ARL)

Space and Missile Defense Command Technical Center

ARL - Army Research Office

Geospatial Research Laboratory

Institute of Surgical Research

Aviation & Missile RDEC

ARL - Simulation & Training Technology Center

Engineer Research and Development Center
Coastal & Hydraulics Lab
Environmental Lab
Geotechnical & Structures Lab
Info Tech Lab

Aeromedical Research Lab

Total Civilian Manpower: ~17,000

- ~12,000 Scientists & Engineers
- ~5,000 Technicians, Analysts, and Administrative support
- ~500 Military S&E

S&T Resources
Funding Categories, Work Focus, Timeframes

As of PB16

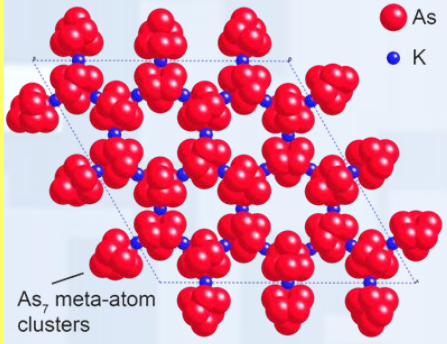
S&T (RDT&E BA 1-3) **$2.2B** (1.7% TOA, 9.5% RDA)

Development $4.7B (3.7% TOA, 20.5% RDA)

Acquisition (Procurement Appropriation) $16.1B (12.8% TOA, 70.0% RDA)

6.1: Basic Research $425M (19% of S&T)

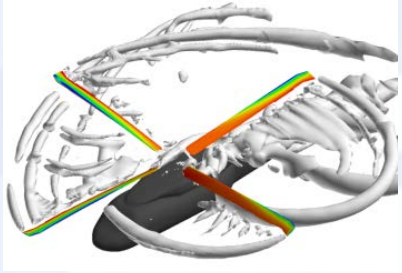
Material Science



- Understanding to solve Army-unique problems
- Knowledge for an uncertain future

6.2: Applied Research $880M (40% of S&T)

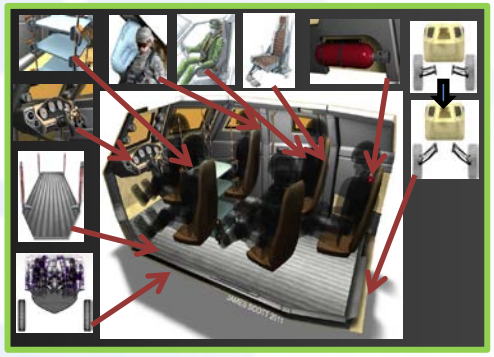
Aeromechanics and Computational Methods



- Applications research for specific military problems
- Components, subsystems, models, new concepts

6.3: Advanced Technology Development $896M (41% of S&T)

Occupant Centric Protection



- Demonstrate technical feasibility at system and subsystem level
- Path for technology spirals to acquisition—rapid insertion of new technology

6.4: Technology Maturation Initiatives $41M

- Funds technology maturation efforts, including competitive prototyping and experimentation in support of selected pre-Milestone B Programs of Record.

6.6: Technical Information Activities $27M

- Advisory Bodies
- Reporting and Info Dissemination
- Studies and Tech Assessment

6.7: Manufacturing Technology $48M

- Address manufacturing issues and facilitate affordable production of weapon systems and materials

Far Term	Mid Term	Near Term
12-20+ yrs	6-12 yrs	0-6 yrs

Army Investments by Portfolio

PB16 - $12.5B (FY16-20)

Soldier/Squad

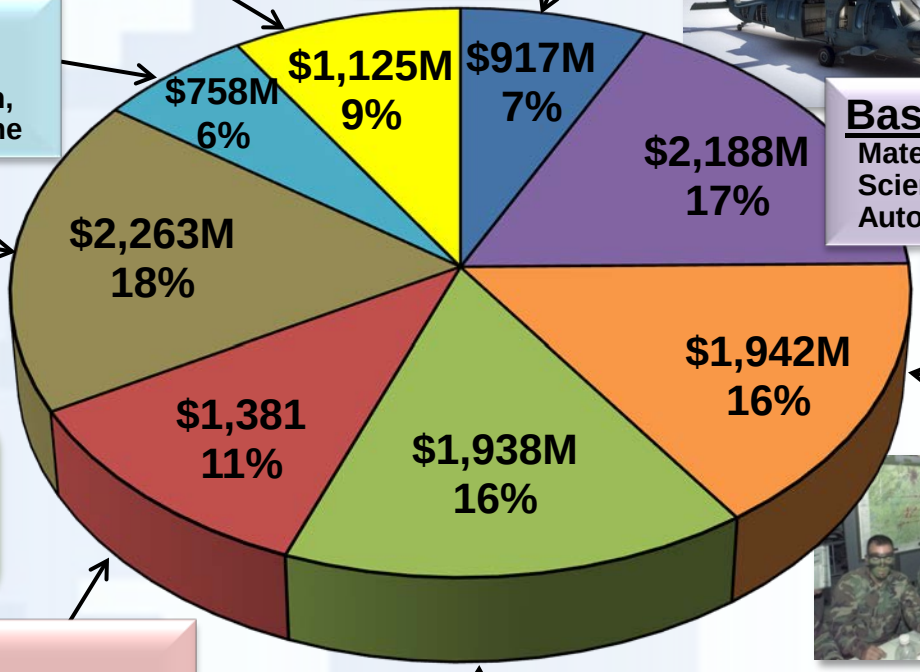
Personnel, Training, Human System Integration, Dismounted mission equipment and power & energy

Air

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

Medical

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

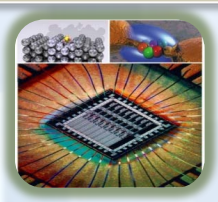


Basic Research

Materials Science; Medical/Life Sciences; Quantum/Info Science; Autonomy; Networks

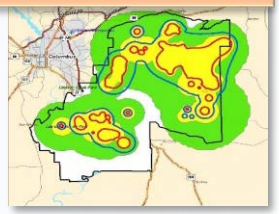
Innovation Enablers

High Performance Computing; Environmental Protection; Base Protection; Studies; Technical Maturation Initiatives; Procurement



C3I

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



Lethality

Offensive/Defensive kinetic (guns, missiles), Soldier Weapons, Directed Energy (HEL) weapons

Ground Maneuver

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

Army Investments	FY16-20
BA1	$2,188M
BA2	$4,573M
BA3	$4,734M
BA4	$217M
BA7	$295M

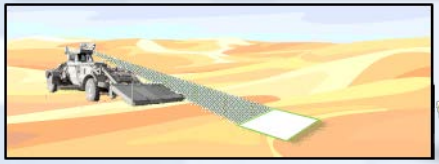
BA6 $181M, Procurement $324M

U.S. Army S&T Major Efforts

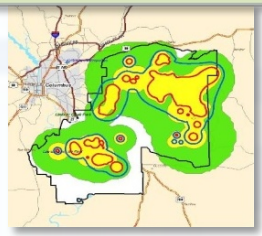
Soldier/Squad
Soldier Training and Human Performance
Soldier Overmatch
Soldier System Engineering Architecture

Air
Advanced Aircraft Design
Degraded Visual Environment Mitigation
Joint Multi-Role Technology Demonstrator

Ground Maneuver
Protected Mobility
Austere Entry & Maneuver
Increased Energy Density and Energy Efficiency

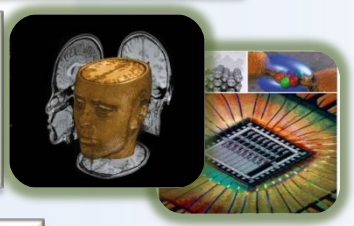


C3I
C3I Vehicle Architectures
High Definition (HD) Multifunction Sensors
Radio Frequency (Comms/EW/PNT) Common Operating Environment



Medical
Post Traumatic Stress Disorder (PTSD) and Traumatic Brain Injury (TBI)
Infectious Diseases (Drugs & Vaccines)
Damage Control Resuscitation

Innovation Enablers
Environmental Lifecycle Analysis
Threatened and Endangered Species
High Performance Computing Modernization Program

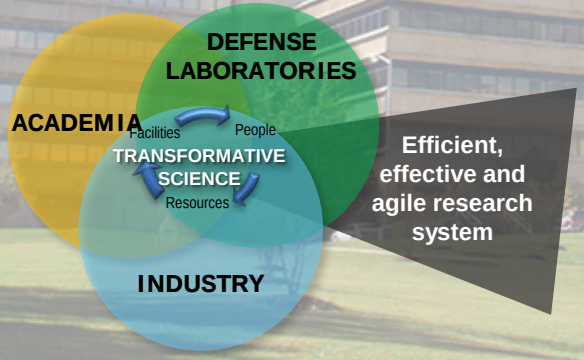


Basic Research
Multi-Scale Modeling of Materials
Intelligent / Autonomous Systems
Human Sciences / Cybernetics
Quantum Effects / Information Science

Lethality
Disruptive Energetics
Counter Unmanned Air Systems/Cruise Missile
Solid State High Energy Laser Technology Demonstration

Army Research Laboratory
Open Campus Initiative

Piloting a New Laboratory Business Model



- ✓Human Sciences
- ✓Information Sciences
- ✓Sciences for Lethality and Protection
- ✓ Sciences for Maneuver
- ✓Computational Sciences
- ✓Materials Research
- ✓Assessment and Analysis

"We will need new technology over the next 10 years to make a leaner and more capable Army."

GEN Raymond T. Odierno
38th Chief of Staff, Army

Responding to the National Security Challenges of the 21st Century

Open Campus Website: http://www.arl.army.mil/opencampus/

Army Science & Technology

Providing Soldiers Technology Enabled Capabilities

MAINTAINING A LEADING EDGE IN TECHNOLOGY