



Army Science & Technology



“America’s Army – Decisive Force”

Army S&T Priorities—Update



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Deputy Assistant Secretary of the Army
for Research and Technology

April 18, 2012



Purpose



- **Update S&T strategy development**
- **Review the new processes we are implementing in Army S&T**
- **Highlight opportunities for partnership**

What we have learned ...

We have learned from last decade of war ...



***This is What We Learned –
It's all about the Soldier and...***

“In the past the small unit was built around the fighting system. Today and for the future, the fighting system must be built around the small combat unit.”

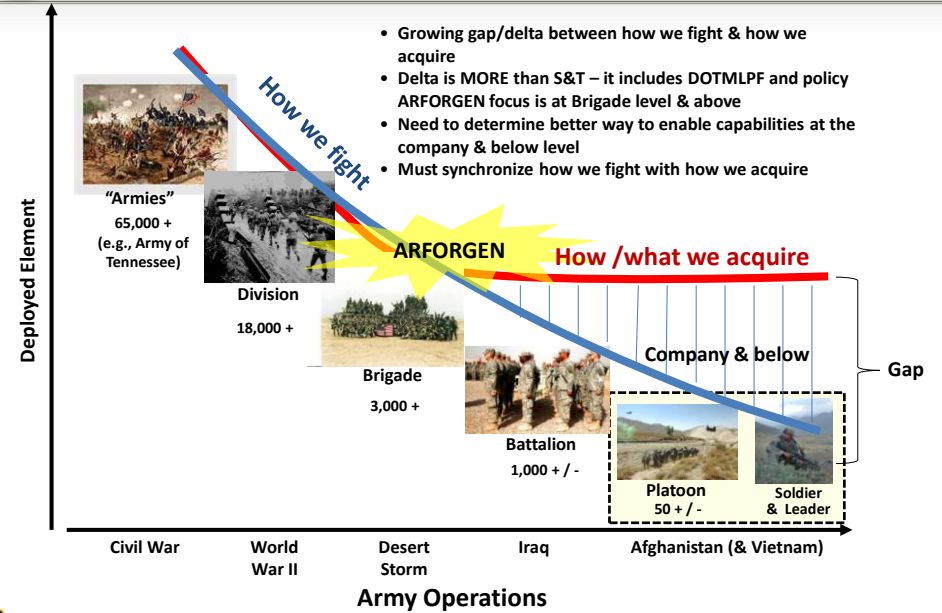
MG(R) Robert Scales*

*Ground Combat Vehicle CONOPS -
Concept paper dated Dec 2, 2010

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



Where should our focus be?



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We will continue to pursue programs focused on the Soldier and small unit capabilities with the intent of making our formations more flexible, adaptable and lethal.



What we have done ...

Since 2010 we have been making strides to address...

DASA(R&T)'s Problem & Challenge

• The Problem

- It takes too long to get technology enabled capabilities to the field
- Army S&T is perceived as irrelevant

• Fixing the Problem requires:

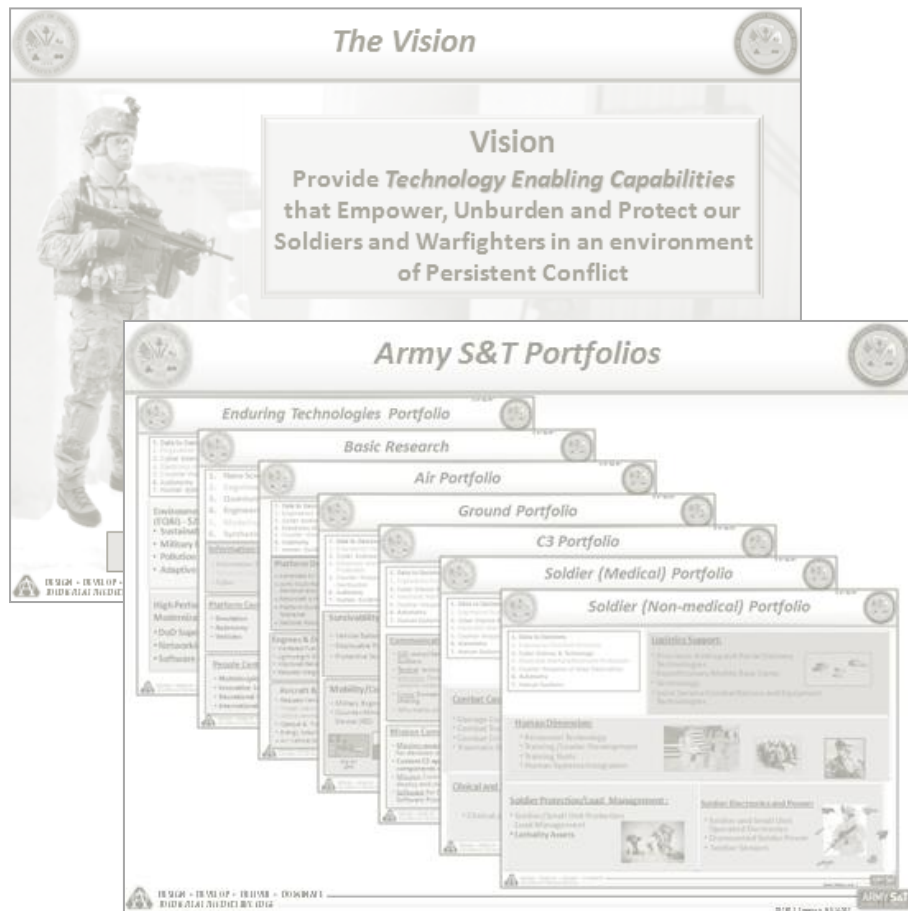
- New comprehensive strategy
- Changing the culture
- Restoring confidence in Army S&T
- Building a strong Partnership with Leadership
- Motivating the workforce towards results

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Soldier Tech - DRAFT



We have validated a new set of priorities for and approaches to managing Army S&T...





The Vision



Vision

Provide *Technology Enabling Capabilities* that Empower, Unburden and Protect our Soldiers and Warfighters in an environment of Persistent Conflict

Our Challenge

Deliver these technologies through effective partnerships in synchronization with Army Force Generation (ARFORGEN) and fiscal processes

Respond Rapidly to Technological Evolution





Army S&T Portfolios

Enduring Technologies Portfolio

Basic Research

Air Portfolio

Ground Portfolio

C3 Portfolio

Soldier (Medical) Portfolio

Soldier (Non-medical) Portfolio

1. Data to Decisions
2. Engineered Resilient Solutions
3. Cyber Science & Technology
4. Electronic Warfare/Electronic Protection
5. Counter Weapons of Mass Destruction
6. Autonomy
7. Human Systems

- Environment (EQ&I) - \$2B
- Sustainable
 - Military Modernization
 - Pollution
 - Adaptive

- High Performance Modernization
- DoD Super
 - Network
 - Software

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1. Nano Science
2. Cognitive
3. Quantum
4. Engineered Resilient Solutions
5. Modeling
6. Synthetic

- Information Centric
- Information Science
 - Network Science
 - Cyber

- Platform Centric
- Simulation
 - Autonomy
 - Vehicles

- People Centric
- Multidisciplinary
 - Innovative Leadership
 - Educational Outreach
 - International

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- Platform Development
- Advanced Air Vehicle
 - Joint Multi-Role Demonstrator
 - Rotocraft Airframe
 - Platform Durability/Tolerance
 - National Rotocraft

- Engines & Drivetrains
- Increased Fuel Efficiency
 - Lightweight Drivetrain
 - Improved Reliability
 - Reduced Weight

- Aircraft & Helicopters
- Reduced Vehicle Weight
 - Threat Warning
 - Active Jammer
 - Opaque & Transparent
 - Energy Absorbent
 - Air Vehicle Structure

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- Survivability
- Vehicle Ballistics
 - Deployable Force
 - Protective Structures

- Mobility/Countermeasures
- Military Engine
 - Counter-Mine Device (IED)

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- Communications
- GIG voice/data
 - Tactical access
 - Intrusion Detection
 - Cross Domain sharing
 - Affordable platforms

- Mission Command
- Mission-aware for decision making
 - Custom C2 applications
 - Mission Command components
 - Software for C2
 - Software Production

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- Combat Casualty
- Damage Control
 - Combat Trauma
 - Combat Critical Care
 - Traumatic Brain Injury

- Clinical and Biomedical
- Clinical and Biomedical

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- Human Dimension
- Personnel Technology
 - Training /Leader Development
 - Training Tools
 - Human Systems Integration

- Soldier Protection/Load Management
- Soldier/Small Unit Protection
 - Load Management
 - Lethality Assets

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- Logistics Support
- Precision Airdrop and Aerial Delivery Technologies
 - Expeditionary Mobile Base Camp
 - Technology
 - Joint Service Combat Rations and Equipment Technologies

- Soldier Electronics and Power
- Soldier and Small Unit Operated Electronics
 - Dismounted Soldier Power
 - Soldier Sensors

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Sources Informing S&T (6.2 & 6.3) Investment Decisions for 2014-2028



Commercial

Other Services

International/Allies

NGIC

Army Capstone Concept

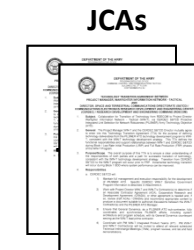
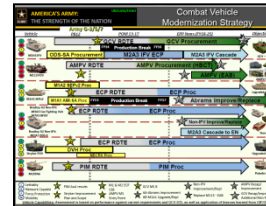
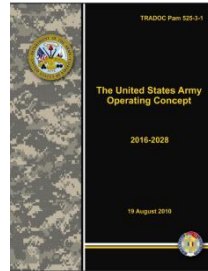
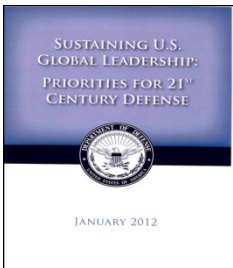
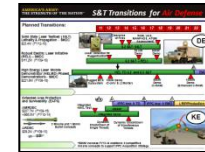
JCIDS

DoD Priorities

TRADOC Future Outlook

TRADOC Warfighter Outcomes, CAN, CBA, ICD, CDD, CPD

Maturation of Technologies for Acquisition Programs of Record or Planned Programs (Army G3/5/7 Capability Portfolio Reviews Roadmaps and Trades)



“...recalibrate its [U.S.] capabilities and make selective additional investments in:”

Desired Capabilities against a predicted future environment in:

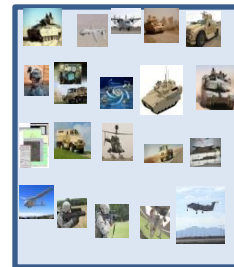
- Counter Terrorism & Irregular Warfare
- Deter & Defeat Aggression
- Project Power Despite Anti-access/Area Denial Challenges
- Counter Weapons of Mass Destruction
- Operate Effectively in Cyber & Space
- Maintain a Safe, Secure & Effective Nuclear Deterrent
- Defend Homeland & Provide Support to Civil Authorities
- Provide Stabilizing Presence
- Conduct Stability & Counterinsurgency Operations
- Conduct Humanitarian, Disaster Relief, & Other Operations

- Mission Command
- Intelligence
- Movement and Maneuver
- Fires
- Protection
- Sustainment
- Training and Leader Development
- Institutional Army
- Human Dimension

Army S&T Vectors (cross-walked to S&T challenges)

Domains	“Big Issues”
Training	Army S&T Vectors (cross-walked to S&T challenges)
Mission Command	Army S&T Vectors (cross-walked to S&T challenges)
Power and Energy	Army S&T Vectors (cross-walked to S&T challenges)
Counter IED & Mine Protection	Army S&T Vectors (cross-walked to S&T challenges)
Human Dimension	Army S&T Vectors (cross-walked to S&T challenges)
Plans	Army S&T Vectors (cross-walked to S&T challenges)
Measurement & Assessment	Army S&T Vectors (cross-walked to S&T challenges)
Intelligence	Army S&T Vectors (cross-walked to S&T challenges)

CPR Roadmaps



JCAs

TTAs



BA4 Tech Maturation

Wargaming Exercises

Three things S&T must invest in:

- 1) What we do that no one else does (maintaining core competencies)
- 2) What we do to advance capabilities
- 3) What “big bets” that others invest in so we can counter



S&T Investment Strategy Balanced Portfolio



Studies, Tech Planning Activities

Competitive prototyping;
Greater than TRL6

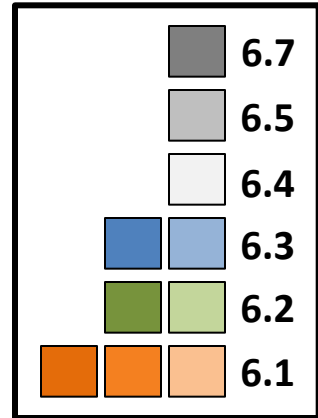
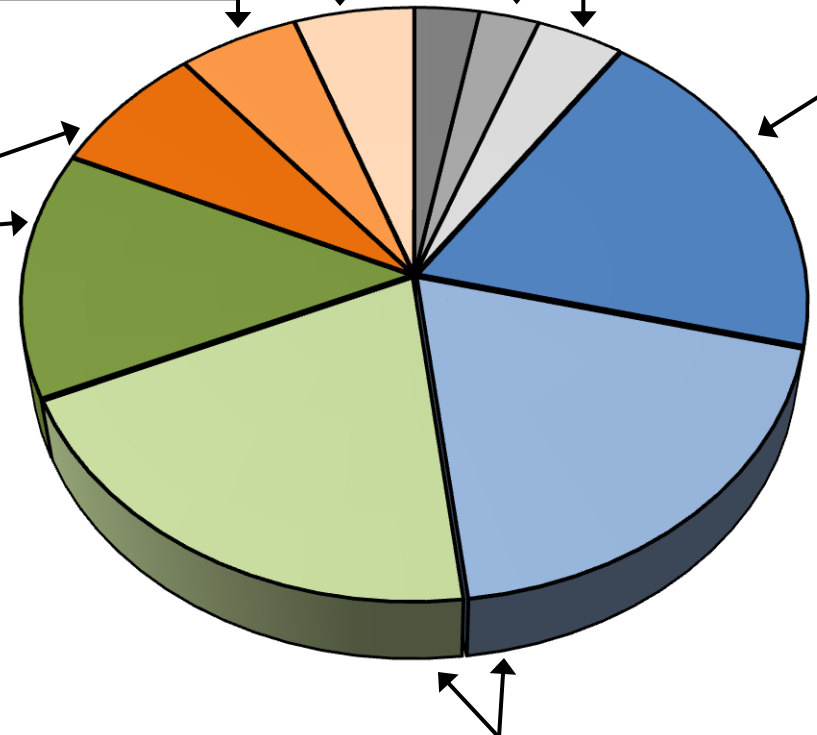
Manufacturing Technology

Long Term Exploration; Invention,
discovery, future gazing, technology trends

TECDs—Near-term
integrated capability
demonstrations—
predominately 6.3,
may have some 6.2

Long-term Game-
Changing (Disruptive)
Technology

Long-term Enabling
Technology
Development—
Innovation, invention,
technology exploitation
to create sub-system
opportunities



Mid-term—Innovation*, maturation, technology demonstration; reducing technological risk; predominately supporting planned Programs of Record

* Includes Rapid Innovation Funding



Big Army Problems that S&T Must Help Solve

Current Focus: “Soldier as the Decisive Edge”



1. There is insufficient **FORCE PROTECTION** to ensure highest degree of survivability across the spectrum of operations.
2. Soldiers in Small Units (squads/fire teams/crews) are **OVERBURDENED** (physically and cognitively); this degrades performance and may result in immediate, as well as, long term consequences.
3. U.S. Army squads are too often **SURPRISED** in tactical situations. Soldiers in Small Units lack sufficient timely **MISSION COMMAND & TACTICAL INTELLIGENCE** to understand where their assets are, who and where the enemy is, who and where non-combatants are and to document and communicate this information to each other and higher echelons.
4. We spend too much time and money on **STORING, TRANSPORTING, DISTRIBUTING and WASTE HANDLING** of consumables (water, fuel, power, ammo and food) to field elements, creating exposure risks and opportunities for operational disruption.
5. Soldiers in Small Units have limited capability to integrate maneuver and fires in all environments to create **TACTICAL OVERMATCH** necessary to achieve mission objectives.
6. Operational **MANEUVERABILITY** (dismounted & mounted) is difficult to achieve in complex, austere, and harsh terrains and at high OPTEMPO.
7. We do not understand **WHAT MAKES THE HUMAN TICK** in a way that can lead to assured ability to perform operational, high OPTEMPO missions effectively and without secondary negative effects.

Problems listed in no particular order – validated by Senior Army Leadership





24 Army S&T Challenges

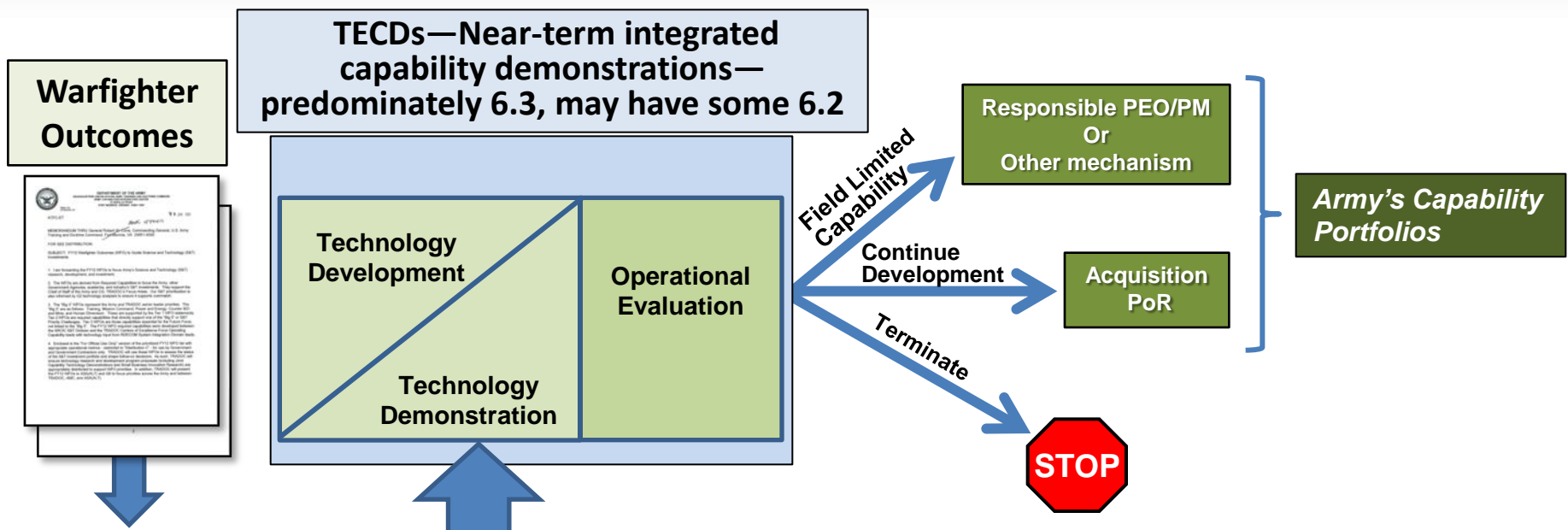


	Challenge #	Challenge Title
Top 5	1b	Force Protection – Soldier & Small Unit
	1c	Force Protection – Occupant Centric Platform
	2a	Overburdened – Physical Burden
	3a	Surprise/Tactical Intelligence – Mission Command
	7d	Human – Medical Assessment & Treatment
Next 5	1a	Force Protection – Basing
	7b	Human – Individual Training to Tactical Tasks
	3b	Surprise/Tactical Intelligence – Actionable Intelligence
	4a	Sustainability/Logistics – Basing
	4b	Sustainability/Logistics – Transport, Distribute & Dispose
Remaining 14	1d	Force Protection – On the Move (Ground)
	2b	Overburdened – Cognitive Burden
	3c	Surprise/Tactical Intelligence – Cultural / Linguistic
	3d	Surprise/Tactical Intelligence – Organic Combat ID
	3e	Surprise/Tactical Intelligence – Overwatch Persistent Surveillance
	3f	Surprise/Tactical Intelligence – METT-TC Data/Information/Knowledge
	3g	Surprise/Tactical Intelligence – Network
	5a	Tactical Overmatch – Deliver Decisive Effects
	5b	Tactical Overmatch – Targeting/Hand-off
	6a	Maneuverability – On the Move (Air)
	6b	Maneuverability – Degraded Visual Environment (brown-out)
	7a	Human – Strength-based Soldier Characteristic Assessments & Readiness
	7c	Human – Collective Training for Tactical Operations
	7e	Human – Trauma Management





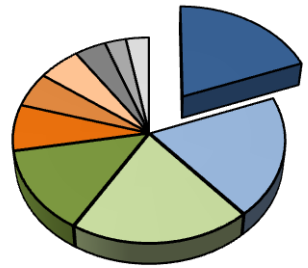
Characteristics of Technology Enabled Capabilities Demonstrations (TECD)



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- Integrated programs across all S&T
- Integrated solutions/multiple systems
- Output is a full capability
- High-level oversight, including TRADOC involvement
- Current status – 9 TECDs approved against Top 10



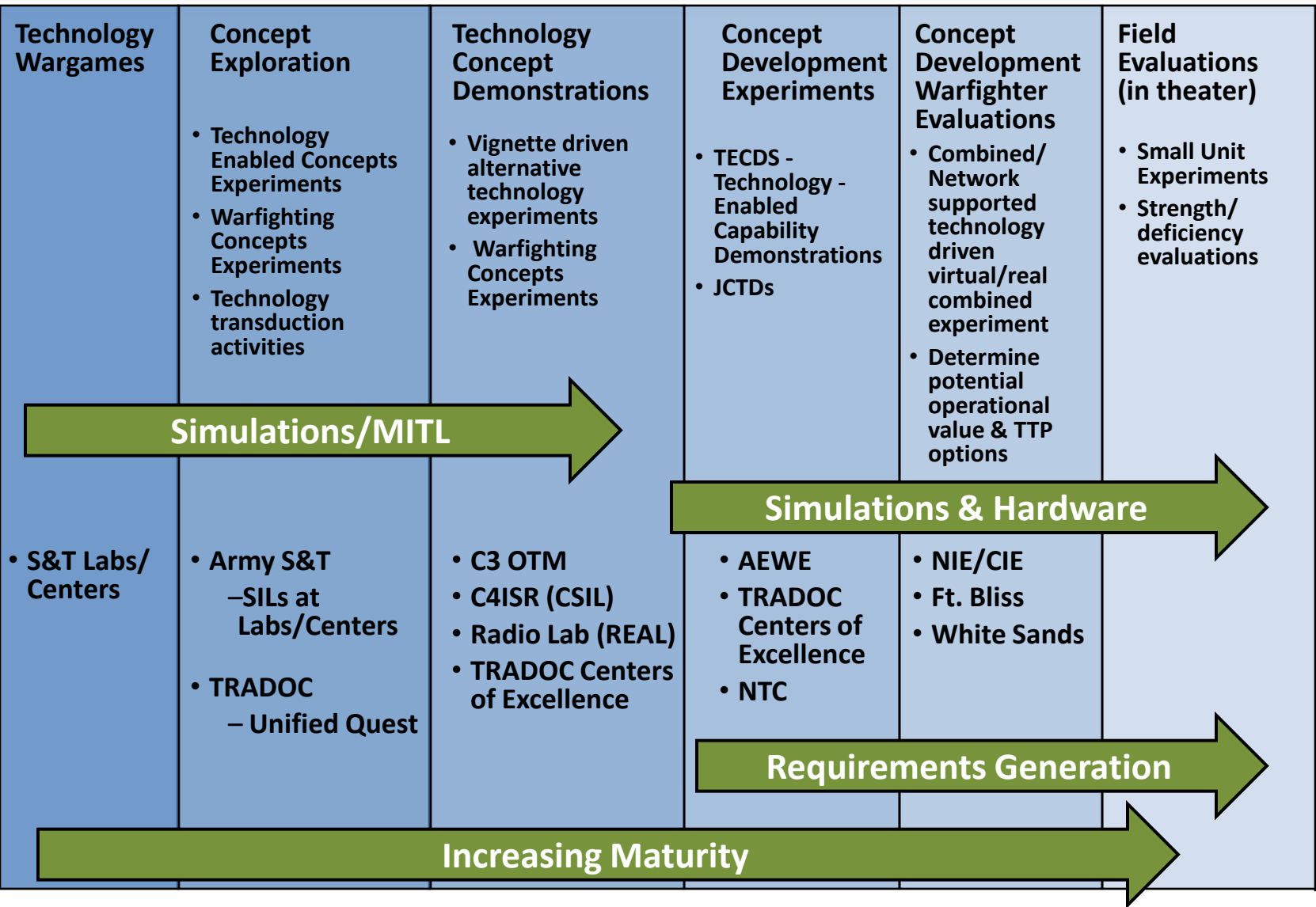
Goal: ~50% Army S&T BA3 Invested in these programs



Experimentation Venues

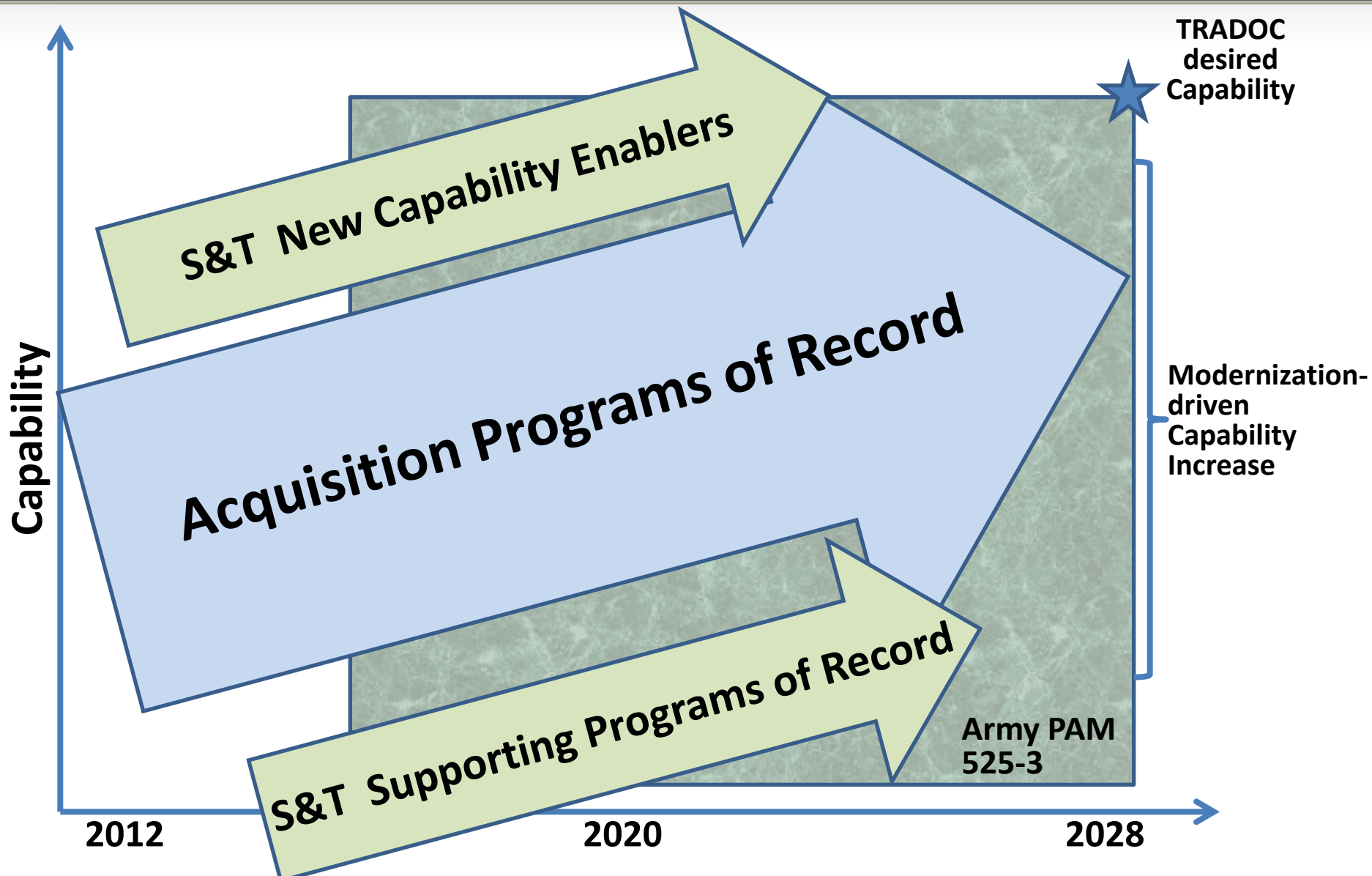
Technology Enabled Concepts through Warfighter Evaluations

PORs and Supporting Requirements (DOTMLPF)



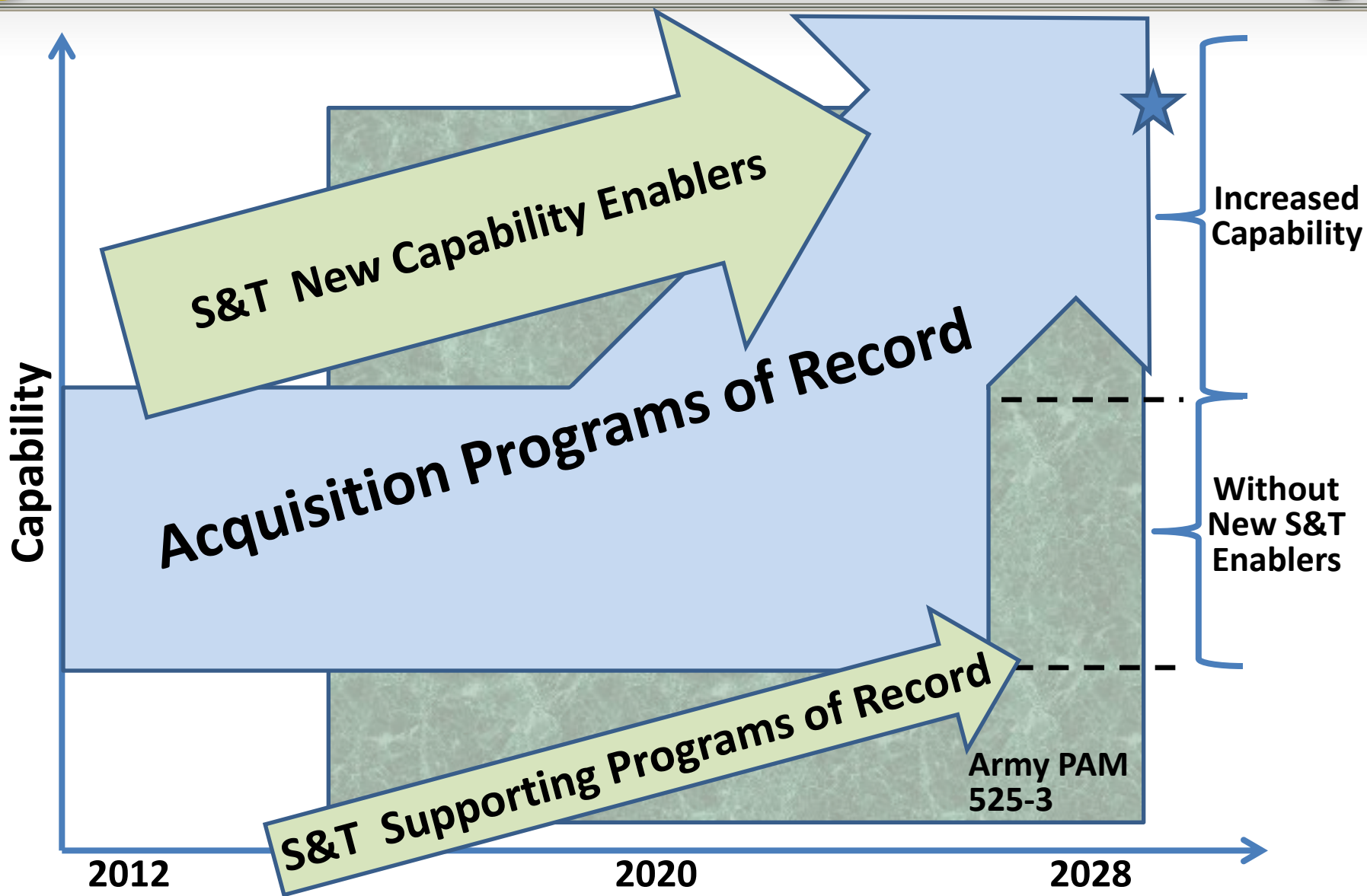


Current Army Modernization Path

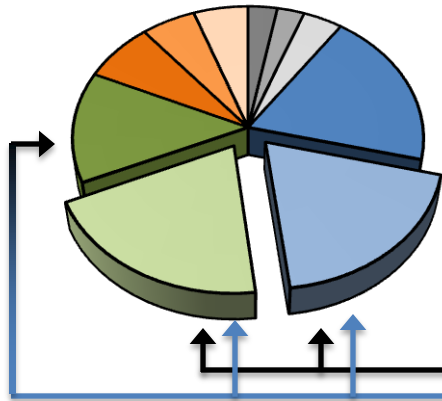




The Rest of the Story Recovered Acquisition Budget

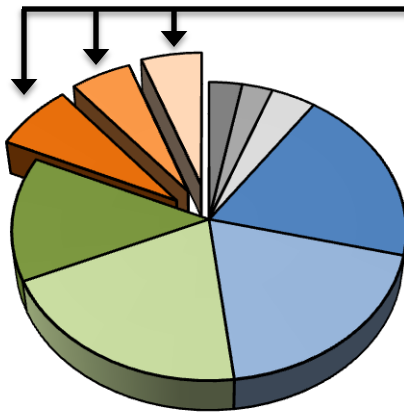


Next Steps



- Get PEO/PM Needs and define a set of programs to meet the highest priority ones

- Identify technologies that have high potential to “Bridge Gaps” or “Leap Ahead” – taking advantage of time when Acquisition programs are slowed down due to constrained budgets – and define a set of programs to meet the highest priority ones



- Define a set of priorities for Basic Research and identify challenge statements against which programs can be proposed and approved



Where can you help?



- **Many opportunities and programs available to partner**
 - **Allied Governments**
 - International Agreements
 - Forums (SNR-A, TTCP, etc.)
 - **Industry**
 - IR&D
 - Army's Rapid Innovation Fund
 - SBIR Program
 - CRADA's
 - **Academia**
 - Grants
 - **Army's International Technology Centers can assist with**
 - Identifying foreign TEC's that may address all or part of a Challenge
 - Partnering with Army laboratories or engineering centers





Army's Rapid Innovation Fund



- **Tremendous response, with over 1,000 White Papers received against the top 10 S&T Challenges**
- **Approximately 10% have been asked to submit full proposals**
- **Plan is to issue another BAA for White Papers in July 2012**





SBIR Program



- **Highly successful program for innovation**
- **In Fiscal Year 2011**
 - 139 Topics
 - 419 Phase I and 204 Phase II proposals awarded
 - Total Awards = \$201 million
- ✓ **Starting this year, SBIR topics/projects will align with TECDs, S&T Challenges and high priority PEO needs**





In Summary...



- **We are changing the Army S&T business model to be an enduring, sustainable, successful enterprise model**
- **We are aligning our strategic planning to the budget processes so that we are more efficient and able to achieve “top-down” S&T leadership investment focus**
- **We are identifying critical Army problems that we can solve in the near and mid-term, using the best talent and skills wherever they exist**
- **We are enhancing visibility of Army S&T priorities to provide partnering opportunities to jointly solve problems and enhance our Warfighter capabilities**

The better we understand our needs and priorities the better able our enterprise will be to give us capability solutions





Portfolio Managers



OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF THE ARMY (RESEARCH AND TECHNOLOGY)

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	Director for Air Technology, Mr. Todd Turner	todd.m.turner.civ@mail.mil
	Director for C3I Technology, Mr. Kris Gardner	kristopher.e.gardner2.civ@mail.mil
	Director for Enduring, Dr. Niki Goerger	maria.n.goerger.civ@mail.mil
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Initiatives	Director for Power & Energy, Dr. Bindu Nair	bindu.r.nair.civ@mail.mil
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For More Information

**Office of the Assistant Secretary of the Army
(Acquisition, Logistics and Technology)**



Army Research & Technology

asaaltaie.wordpress.com



Army Science & Technology



Providing Soldiers Technology Enabled Capabilities

MAINTAINING A LEADING EDGE IN TECHNOLOGY