Army Science & Technology

Army Rapid Innovation Fund

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Provide our Soldiers a decisive advantage in any mission by developing, acquiring, fielding, and sustaining the world's best equipment and services and leveraging technologies and capabilities to meet current and future Army needs.
Roles of Science and Technology

- **Fundamental Research**: Basic and Early Applied Research
  - TRL 1-3
  - Quick Reaction
  - 1-2 Years

- **Investigate Technology Options**: Advanced Development Research
  - TRL 3-4/5
  - 2-4 Years
  - Experimental Prototyping & Improve Current Systems
    - Drive Down Technical Risk
    - Inform Achievable Requirements

- **Innovate Technology Options**: Applied Research
  - TRL 4-6
  - 4-8 Years
  - High Energy Laser – Tactical Vehicle Demonstrator
  - Joint Multi-Role Technology Demonstrator

- **Investigate Technology**: Prototyping and Improving Current Systems
  - TRL 6/7
  - 6-15 Years
  - Disruptive Energetics
  - Blast Protection for Platforms and Personnel
  - Aeromechanics and Computational Methods

- **Innovate Technology Options**: TRL 3-4
  - 2-4 Years
  - Manned-Unmanned Teaming

- **Fundamental Research**: Materials by Design
  - TRL 7+
  - 10-30 Years
  - NeuroScience
  - Conceptualized Quantum Memory

**Technology Maturity**

- TRLs: Fundamental/Disruptive (TRL 1-3), Investigate Technologies (TRL 3-4/5), Innovate Technology Options (TRL 4-6), Investigate Technologies (TRL 6/7), Innovate Technology Options (TRL 6-15), and Prototyping and Improving Current Systems (TRL 6-15).

**Time Frame**

- **Near**: Quick Reaction
  - 1-2 Years
- **Mid**: 2-4 Years
- **Far**: 6-15 Years
**Priority Investment Areas**

- **Army S&T Portfolio focus towards acceleration of priority technologies**
- **Priority technologies include:**
  - Capability Enablers for 2026 and beyond
  - Decide Faster
  - Manned-Unmanned Teaming
  - Asymmetric Vision
  - Survive and Project Indirect Fires
- Chief of Staff of the Army (CSA) Priorities

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**CSA Priorities**

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<th>Initiative</th>
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Army S&T Enterprise—Research, Development & Engineering Centers (RDEC) & Labs

- 16 Army labs within 5 Army S&T Commands
- Approximately 13,000 Army Civilian Scientists and Engineers
  - 45% Bachelors Degree
  - 40% Masters Degree
  - 15% Doctorate Degree

- AMRDEC – Army Aeroflight Dynamics Directorate
- ECBC – West Desert Test Center – Life Science Division
- ARL – Battlefield Environments and Survivability Elements
- Institute of Surgical Research
- ARL South
- Engineer Research and Development Center
  - Coastal and Hydraulics Lab
  - Environmental Lab
  - Geotechnical & Structures Lab
  - Info Tech Lab
- ERDC – Army Construction Engineering Research Lab
- Space & Missile Defense Command Technical Center
- Aviation & Missile RDEC
- ARL – Army Research Office
- Research Institute of Environmental Medicine
- Natick Soldier RDEC
- ERDC Cold Regions Research & Engineering Lab
- Armament RDEC
- Edgewood Chem Bio Center
- Research Institute of Chemical Defense
- ARL – Simulation & Training Technology Center
- ERDC Geospatial Research Laboratory
- Walter Reed Army Institute of Research
- Army Research Laboratory (ARL)
- Research Institute of Infectious Disease
- HQ, RDECOM
- Communications-Electronics RDEC
- 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
How the Army Uses the Rapid Innovation Fund

Rapid Innovation Fund Topics are Driven by Near Term Program Executive Office (PEO) Needs.

PEOs are the organizations that acquire technology (e.g. PEO Missiles and Space, PEO Ammunition, PEO Aviation, etc.)

Topics in the RIF Broad Agency Announcement are provided by the PEO Program offices.

Businesses are encouraged to work with PEOs to understand PEO needs--and also to apprise the PEOs of your capabilities.

RIF gives PEOs the ability to handle unforeseen programmatic issues.

DOD/Army program development process lacks flexibility
Challenge:
Develop an occupant centric crew cab which provides increased blast protection to 4x at 25% reduced system weight.

Army Benefit:
Demonstration of an Occupant Centric Crew Cab prototype (that demonstrates increased occupant survivability from a large 4x blast event. The Griffin prototype is leveraging new thick blast resistant aluminum alloys and forming technologies and recent advances in high-fidelity computational physics.

Accomplishments:
- Full Scale Testing shows greatly reduced acceleration loading to the occupants from the baseline.
- Correlation of blast models to the full scale testing
- Optimization technology, integration strategies and lessons learned incorporated into the Occupant Centric MIL-STD draft document.

Results:
- Advancement in confidence of blast modeling and simulation
- Positive Full Scale Test Results showing great improvements for reduced occupant injuries
- CAD and Build Drawings

Army Challenge Area – 1C Force Protection
Industry Partner: Corvid Technologies
Development of Core/Shel Permethrin Reservoirs for Enhanced Soldier Protection

Challenge:
Develop an encapsulated permethrin and attachment mechanism that will allow for a tuned, controlled release of permethrin from textiles/uniforms during laundering.

Army Benefit:
Improved permethrin retention and %Bite Protection after multiple launderings for longer lasting protection from disease carrying vectors.

Accomplishments:
Contractor testing has shown that the encapsulation technology prolonged the permethrin’s presence on the surface of the treated fabric.

Results:
Increases Soldier effectiveness and readiness by reducing susceptibility to debilitating insect borne diseases such as malaria.

Army Challenge 1b: Force Protection – Soldier and Small Unit
Industry Partner: SciGenesis, LLC
Ground Guidance Load Based Mission Planning

**Challenge:**

- Soldiers are overburdened and loads affect Soldier performance and small unit capability.
- Combat loads contribute to acute and chronic injuries, and negatively impact Soldier effectiveness.
- There are no integrated tools to help the Squad leader during mission planning to support informed course of action analysis related to impacts of load & selection of routes.

**Army Benefit:**

This project integrated the Ground Guidance® load and route selection tools into existing platforms to support informed course of action analysis by small unit leaders during the time constrained mission planning phase.

**Accomplishments:**

- The Ground Guidance® route planning and assessment tools have been integrated via a software plug-in and demonstrated with existing, fielded battle command / mission planning systems.

**Results:**

Mission performance is improved by optimizing loads and courses of action

Army Challenge 2a : Overburdened – Physical Burden, NSRDEC

Industry Partner: Primordial
Summary

• The Army encourages industry participation in the Rapid Innovation Fund process
• Year of execution topic selection adds flexibility to PEO/PM community for issues not anticipated in longer range programmatic planning
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Providing Soldiers Technology Enabled Capabilities

MAINTAINING A LEADING EDGE IN TECHNOLOGY