



# SPECIAL OPERATIONS FORCES ACQUISITION, TECHNOLOGY, & LOGISTICS

*Win • Transform • People*

Howard Strahan *Deputy Director, Science and Technology*  
**SCIENCE & TECHNOLOGY** Overview





# SOF AT&L



## MISSION

Provide rapid and focused acquisition, technology, and logistics to Special Operations Forces.



## VISION

Trusted Experts



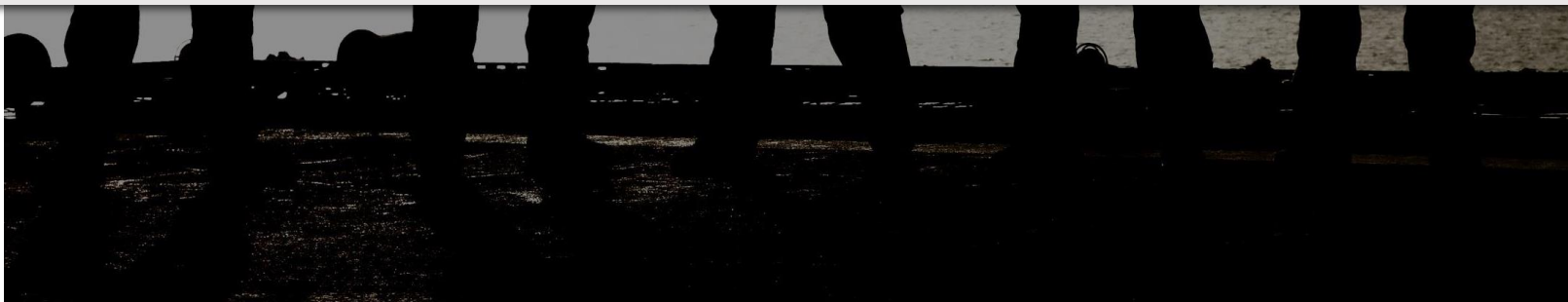
## PRINCIPLES

Deliver capability to user expeditiously; exploit proven techniques and methods; keep Warfighters involved throughout process; take risk and manage it!

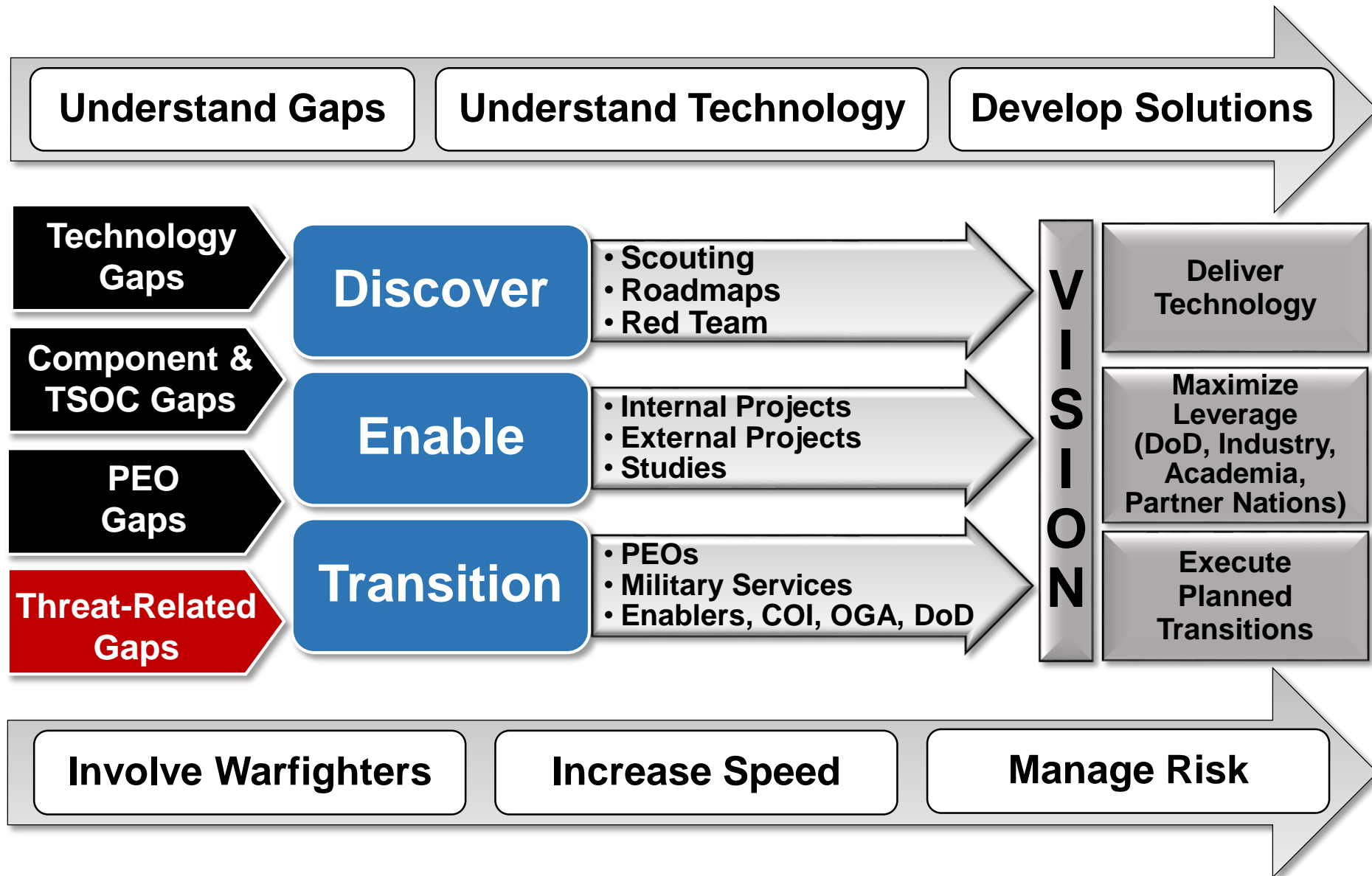
# SOF AT&L-ST Vision



**Discover, Enable, and Transition technologies  
to provide an asymmetric advantage for  
Special Operations Forces**



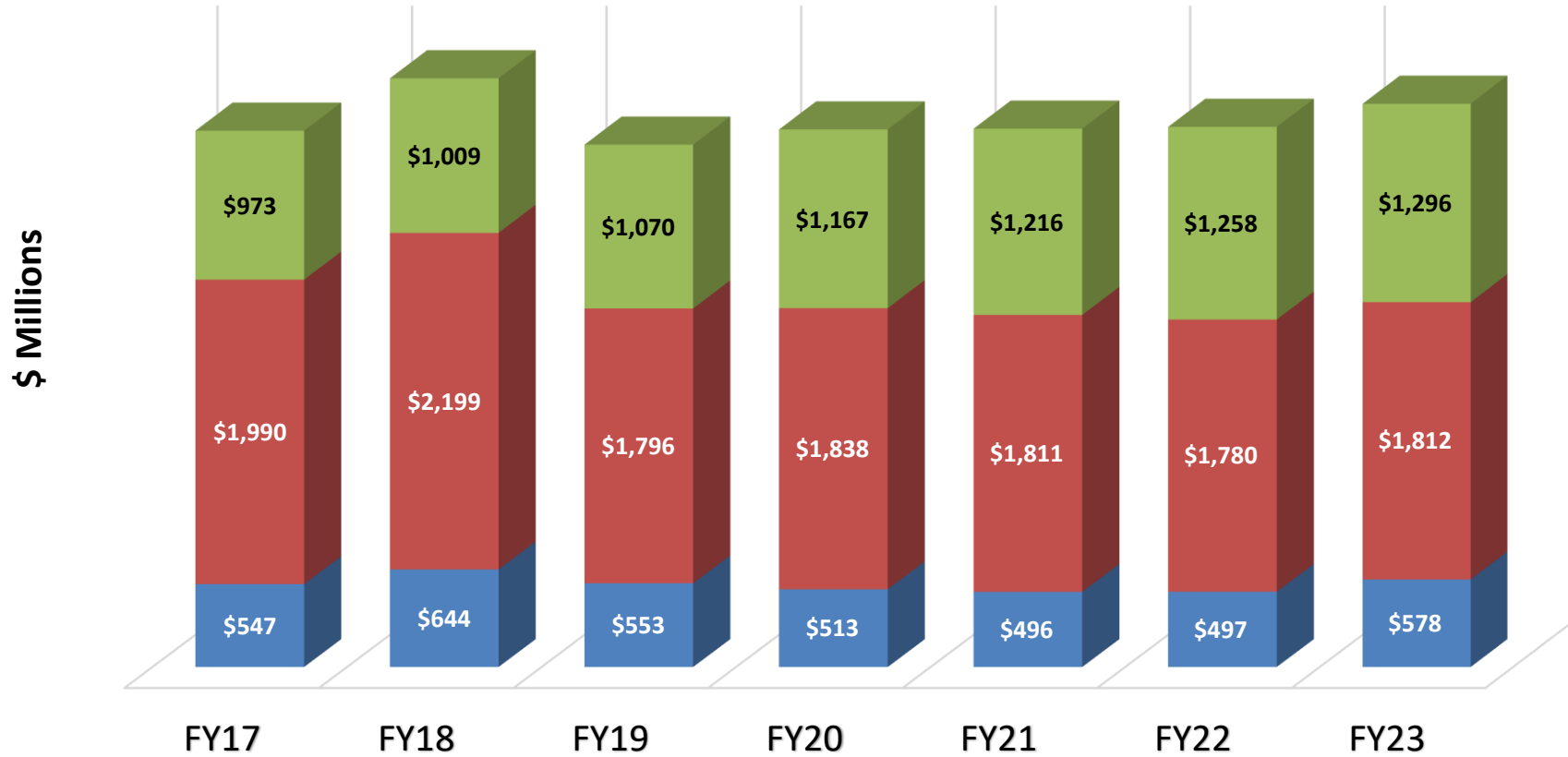
# S&T Execution Overview



# S&T MFP-11 Funding

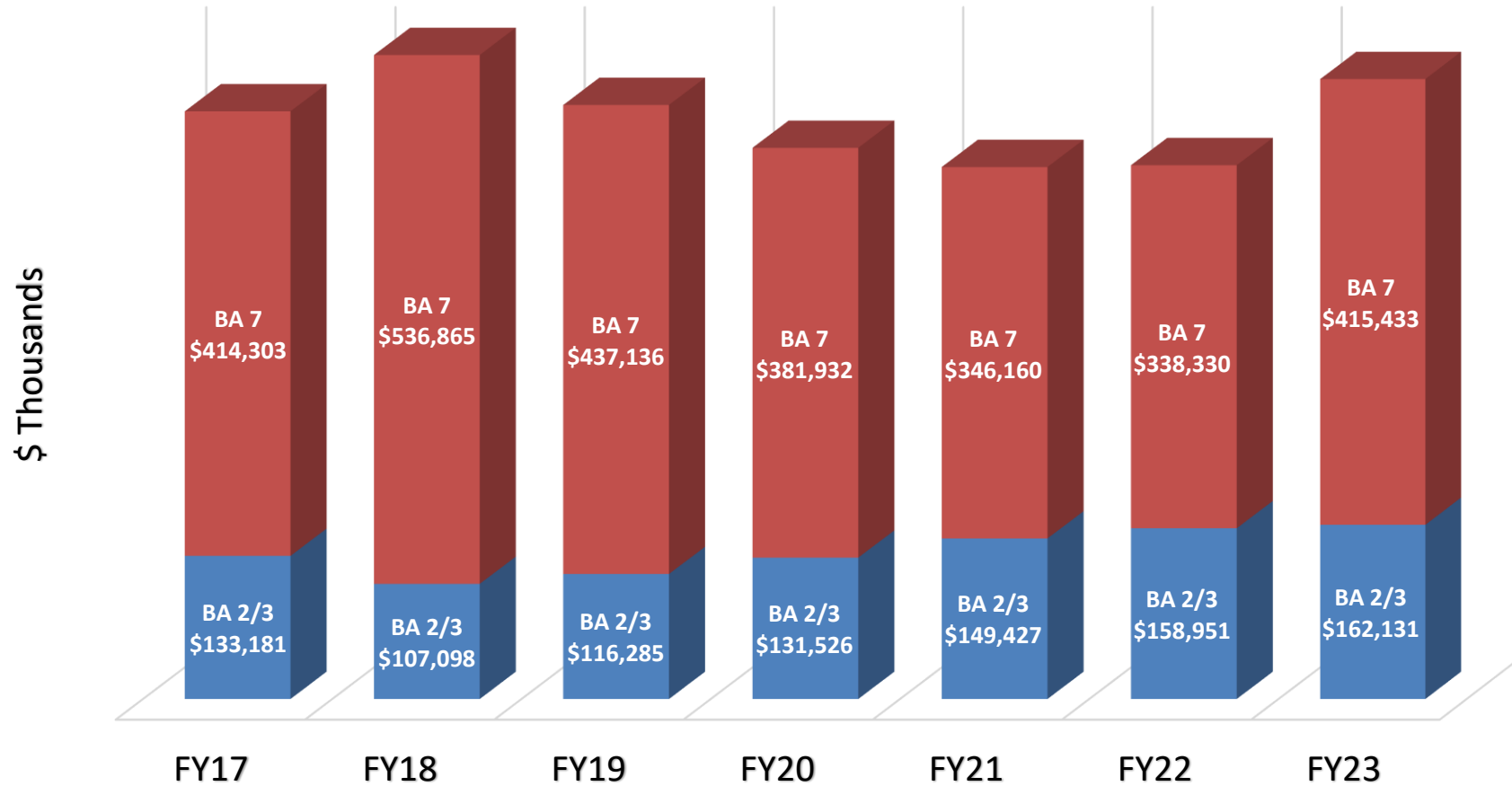
19 PBR

RDTE PROC OM



# S&T MFP-11 Funding

## RDT&E TOTAL



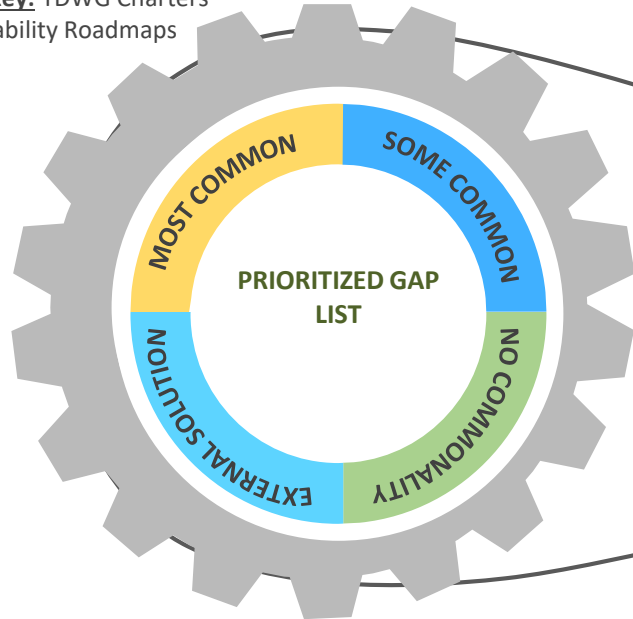
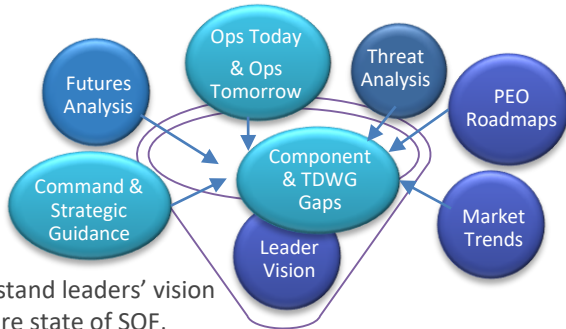




# S&T Portfolio Process

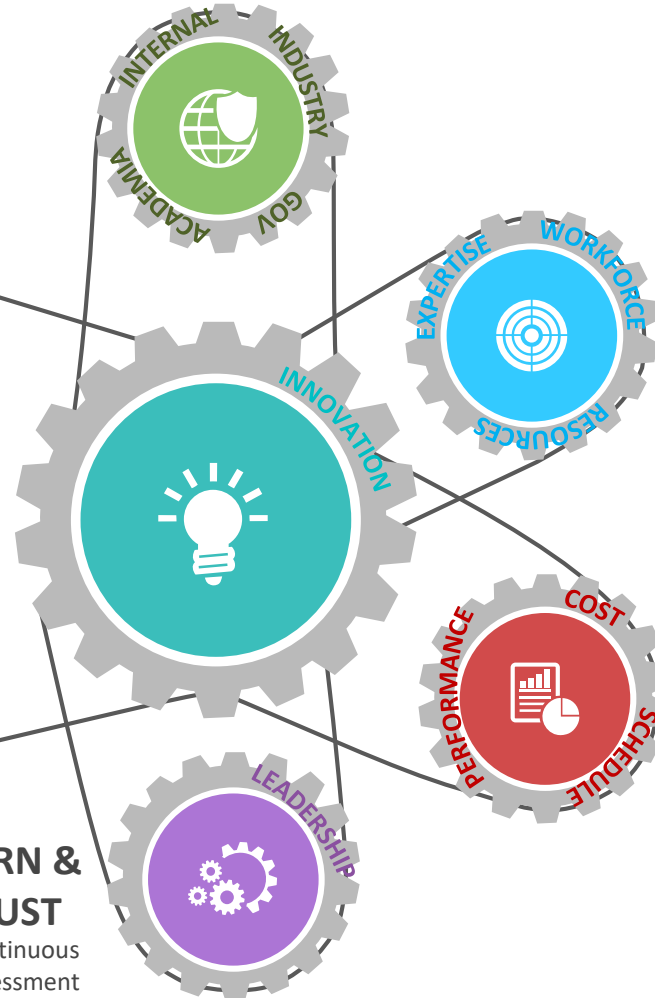
## 01 ALIGN

- Understand leaders' vision of future state of SOF, threat analysis, future trends and associated capability gaps (Annual)
- **Key:** TDWG Charters  
Capability Roadmaps



## 02 COMMUNICATE

- Message the vision and explain the process to obtain buy-in
- Solicit input
- **Key:** Engagement & Marketing Strategy  
Virtual Industry Day and Podcast  
Market RFI



## 05 LEARN & ADJUST

- Continuous assessment

## 03 COMMIT

- Execution paths
- Assign resources
- **Key:** Project alignment matrix  
Spend plan  
TDWG FY Battle Rhythm  
(for workload balancing)

## 04 EXECUTE

- Implement and actively manage
- **Key:** Quarterly portfolio review  
15-min weekly status

**EXPLORE:** Primarily specialized capabilities that emerging technology completely enables or provides a revolutionary impact. Concept development recommended prior to substantial development. (SOFWERX, Capstone, Land Grants, UARCs, Crowdsorce, Prize challenges)

**LEAD:** Areas that support critical SOF capabilities and have insufficient external emphasis to assure Future SOF asymmetric advantage without SOF S&T participation. (BAA, SBIR, Cost-Share, Engineering Analysis, SOFWERX, Prize Challenges, Capstone, Land Grants, UARCs)

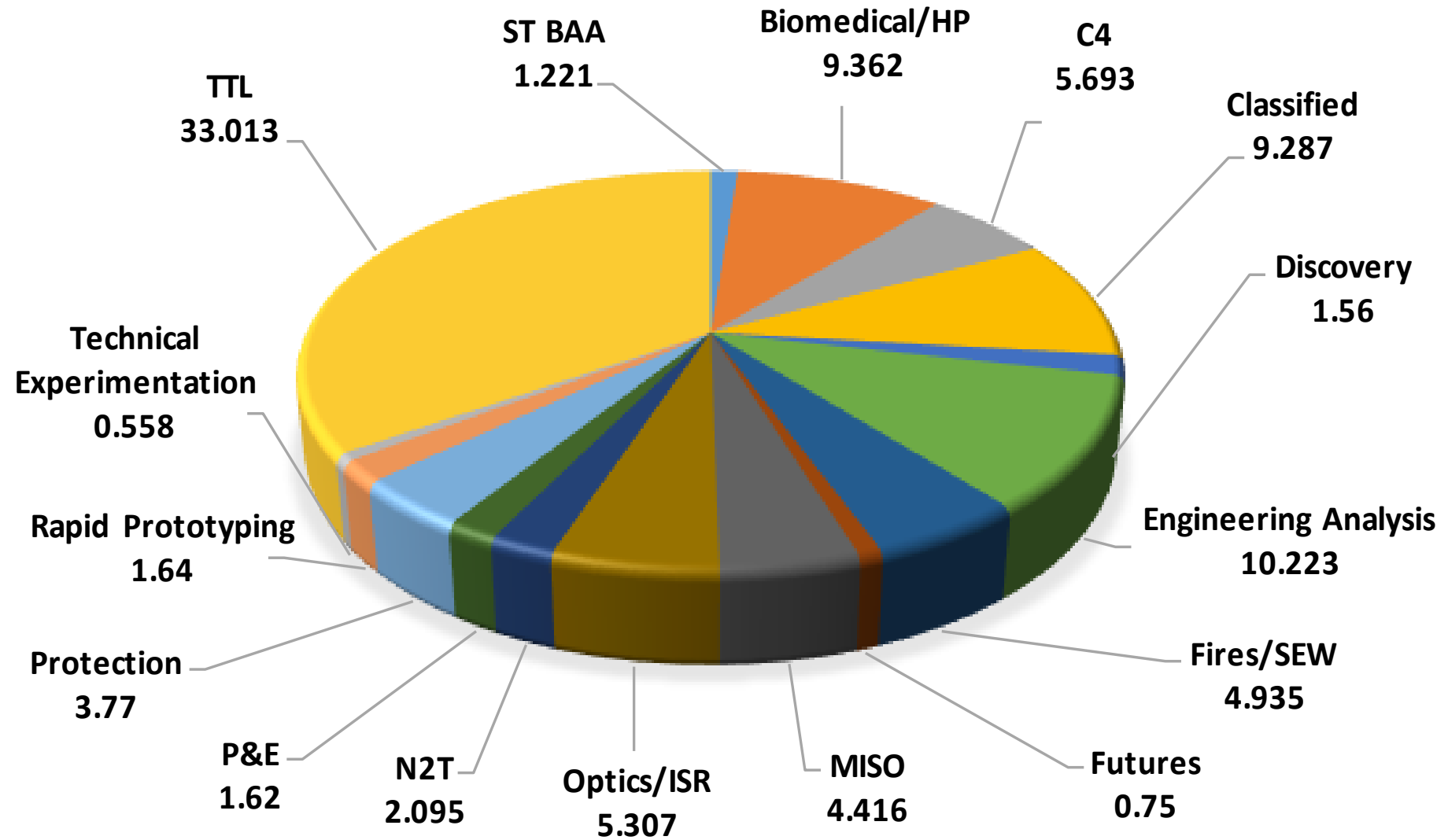
**COLLABORATE:** Team, actively participate, and invest with other organizations, membership on IPTs, impose technical standards.

**INFLUENCE:** No financial investment but sharing of specifications, some representation or peer review. Potential endorsement of external activities. (CRADAs)

**MONITOR:** Completely passive approach but keeping informed on progress; nominate areas for increased participation.



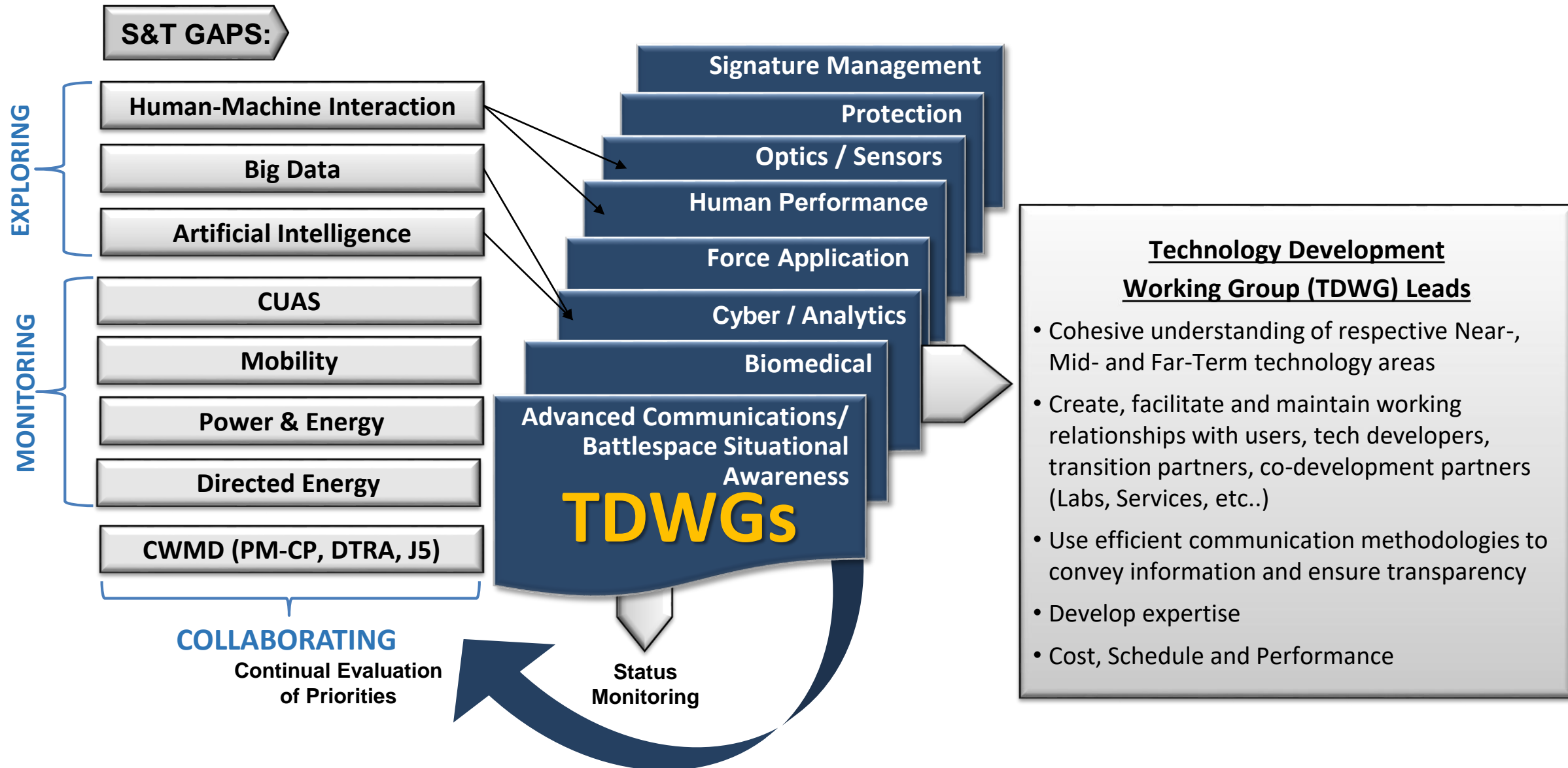
# S&T FY18 S&T Spend Plan



## S&T Major Drivers/Activities

- Integrating science & technology (S&T) efforts across the SOF enterprise. Ensuring that capability gaps are aligned with technology enablers and developers, ongoing efforts are integrated with transition partners, additional innovation that is required to address S&T gaps is identified, and disruptive technology solutions are assessed for their impact and potential benefit to the SOF mission set.
- Linking S&T Strategy to Rapid Prototyping Series (RAPS) events and executing actionable technology development efforts that support USSOCOM Program Executive Office (PEO) POM Technology Insertion Roadmaps (TIR) high priority needs
- Maintaining execution of tactical SOF S&T capability interests and resources
  - SOF S&T funds
  - Leverage Service/DoD efforts
  - Leverage Non-Traditional Avenues

# S&T Portfolio Analysis



# Directorate of Science and Technology

## BIOMEDICAL/ HUMAN PERFORMANCE



Human Performance

## FORCE APPLICATION



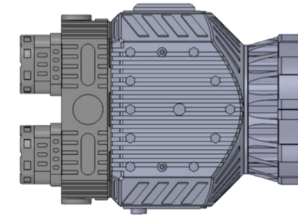
Small Unit Dominance CBA

## ADVANCED COMMUNICATIONS



PNT in Contested  
Environments (PACE)

## OPTICS / SENSORS



1080P Color Night Vision

## PROTECTION



Variable Transmission  
Laser Protection Eyewear

## CYBER / ANALYTICS



Artificial Intelligence/  
Machine Learning

## TACTICAL ASSAULT LIGHT OPERATOR SUIT (TALOS)



Integrated Advanced VAS/  
Exoskeleton

## TECHNICAL EXPERIMENTATION (TE)



TE Themed Experiments

## EMERGING CAPABILITIES & PROTOTYPING



JCTDs

## SMALL BUSINESS INNOVATION RESEARCH (SBIR)



TALOS – Thermal  
Management & Sensing  
Baselayer



# SOF S&T Needs



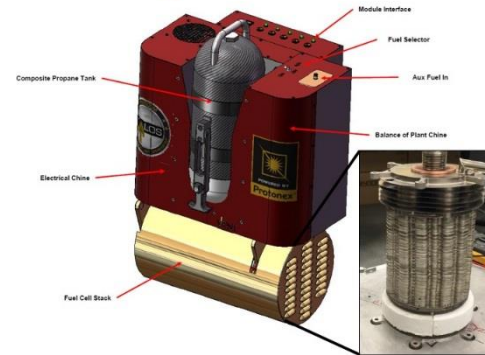
- Comprehensive Signature Management for personnel & platforms
- Unmatched ballistic protection through advanced armor/novel materials
- Capabilities to sufficiently execute Countering Weapons of Mass Destruction (CWMD)
- Enhanced Human Performance
- Far-Forward Combat Casualty Care (CCC)
- First pass accuracy and lethality
- SOF Small Unit Dominance (SOFSUD)\*
- Precision Guided Munitions (PGM)/Scalable Effects Weapons (SEW)
- Counter-Terrorism (CT)/Tagging, Tracking, & Locating (TTL) technologies
- C4 revolutionary capabilities
- Optical electronics, Infrared (IR), & Lasers
- Anti-Access/Area Denial (A2/AD)
- Battlespace awareness
- Intelligence, Surveillance, & Reconnaissance (ISR)
- Cyber/Social media analysis tools
- Leap ahead Power & Energy (P&E) systems
- Biometrics/Sensitive Site Exploitation (SSE)
- Military Information Support Operations (MISO)

# Special Operations Technology Development (SOTD)

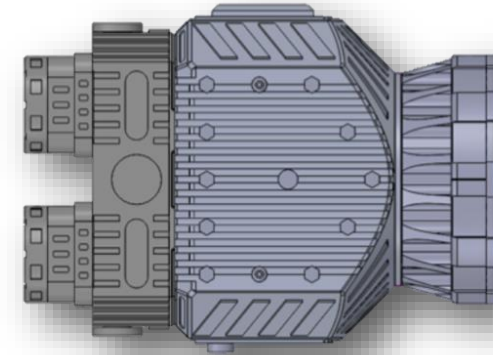


Biomedical R&D

## Mechanical Design CAD



TALOS Solid Oxide Fuel Cell  
Power & Energy



Optics/ISR – 1080P Color  
Night Vision



C4 – Immersive Training  
Technology



Protection –Variable Transmission  
Laser Protection Eyewear (VTLPE)

## Appropriation

- RDT&E: PE 1160401BB, SOF Technology Development, Project S100

# Special Operations Special Technology (SOST)



Technical Experimentation (TE)



PNT Application in Contested Environments (PACE)



TALOS  
Integrated Advanced Visual Augmentation System (VAS), Thermal Management & Sensing Baselayer and Exoskeleton



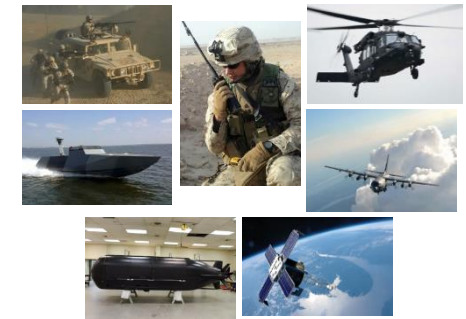
Human Performance (HP)



SOF Small Unit Dominance Capability Based Assessment (SOFSD)



VULCAN Application



Engineering Analysis (EA)

## Appropriation

➤ RDT&E: PE 1160402BB, SOF Advanced Technology Development, Projects S200/SF101

# S&T Futures Process

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A FOUNDATIONAL PROCESS **that is** FLEXIBLE/ADAPTABLE **and**  
PROVIDES A FRAMEWORK

ITERATIONS **are** MISSION/OBJECTIVE FOCUSED **and**  
ENABLE BRAINSTORMING/IDEATION



# S&T Futures Process

## • Results

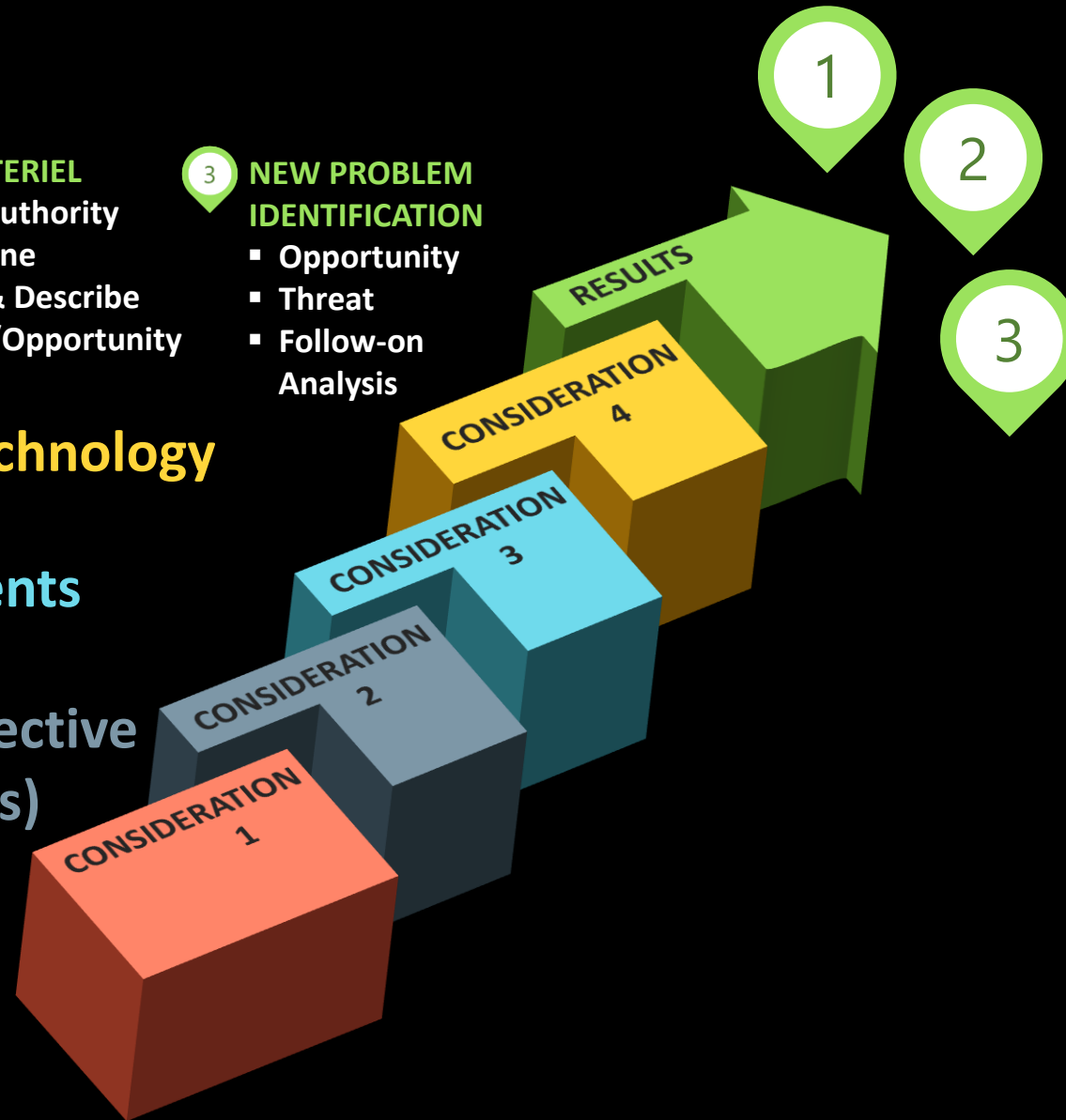
- |   |   |  |
|---|---|--|
| <p>① <b>MATERIEL APPROACHES</b></p> <ul style="list-style-type: none"> <li>▪ Leap Ahead</li> <li>▪ Asymmetric</li> <li>▪ Divergent</li> </ul> | <p>② <b>NON-MATERIEL</b></p> <ul style="list-style-type: none"> <li>▪ Policy, Authority &amp; Doctrine</li> <li>▪ Assess &amp; Describe Impact/Opportunity</li> </ul> | <p>③ <b>NEW PROBLEM IDENTIFICATION</b></p> <ul style="list-style-type: none"> <li>▪ Opportunity</li> <li>▪ Threat</li> <li>▪ Follow-on Analysis</li> </ul> |
|---|---|--|

## • Rapidly Changing Technology

## ← Changing Environments

## • Varying Mission Objective (Measures of Success)

## ✕/√ Changing Strategic Conditions



# S&T Innovation Foundry Events

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INAUGURAL INNOVATION FOUNDRY EVENT TOOK PLACE IN OCTOBER 2017

INCORPORATED DESIGN THINKING  
LEVERAGED DIVERSE PARTICIPANTS

USING 2 SOF MISSION SCENARIOS, IDENTIFIED 24 FUTURES CONCEPTS **and**  
ASSOCIATED SUB-CONCEPTS/KEY TECHNOLOGIES WITH THE POTENTIAL TO  
REVOLUTIONIZE SOF MISSIONS 10-15 YEARS IN THE FUTURE

# SOF “Hard” Problems



- **SOF SMALL UNIT DOMINANCE**
  - Integrated Operator
- **MISSION ASSURED COMMUNICATIONS**
  - Cyber
  - Contested Environment
  - Austere/Remote Operating Location
- **COMPREHENSIVE SIGNATURE MANAGEMENT**

# SOF Hard Problems

## USSOCOM

SCIENCE AND TECHNOLOGY - PREPARING FOR THE FUTURE 2020-2030



## SPECIAL OPERATIONS COMMAND WANTS YOUR HELP SOLVING THEIR HARD PROBLEMS



United States Special Operations Command's Science and Technology (S&T) Directorate has developed three Special Operations Forces (SOF) Hard Problems that are of critical importance to SOF missions. They are: **Small Unit Dominance**, **Mission Assured Communications**, and **Signature Management**. The three SOF Hard Problems are available for download at:

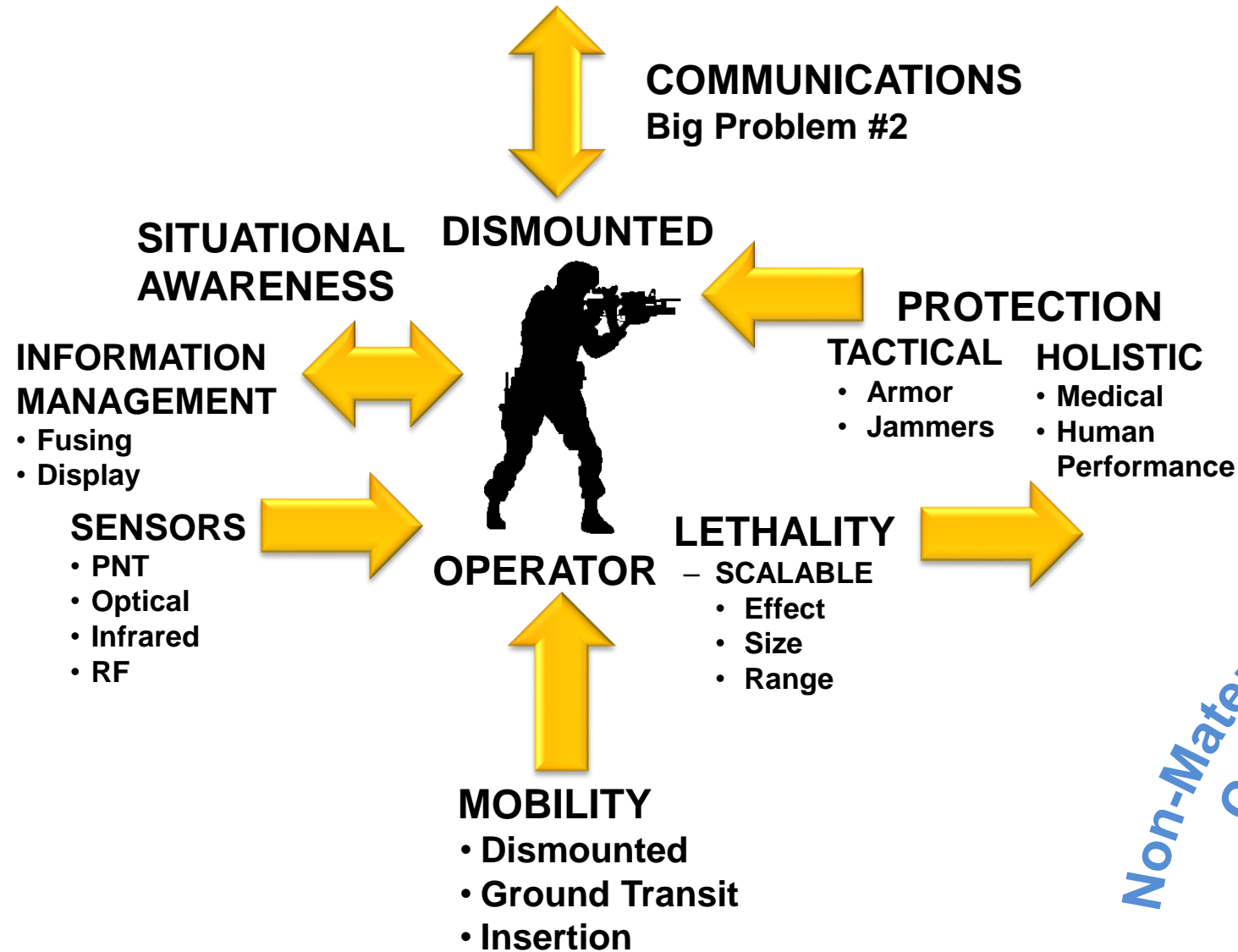
<https://www.socom.mil/SOF-ATL/Pages/SOF-Hard-Problems.aspx>.

If you think you've got a solution that can help USSOCOM's S&T Directorate solve some or all of the SOF Hard Problems please reply via their Hard Problems mailbox also located on that same website. Please feel free to distribute this information to interested parties that could provide potential solutions to these S&T SOF "Hard Problems."



# SOF Small Unit Dominance

- MISSIONS**
- Direct Action
  - Hostage Rescue and Recovery
  - Counterterrorism
  - Countering Weapons of Mass Destruction
  - Counterinsurgency



*Adversary Impact*

- Capability / Threat
- Task / Purpose
- Intelligence

*Non-Materiel Enablers / Constraints*

- Doctrine
- Training
- Policy / Authority
- Task / Purpose

# SOF Mission Assured Communications

## GLOBAL NETWORK

- Interoperable, Adaptive Networks
- Infinitely Scalable
- Resilient, Robust, & Redundant
- Big Data Analytics

## INFORMATION MANAGEMENT

- Increased Capacity & Efficiency
- Reduce Cognitive Workload
- Multiple Transport Methods

## ALL DOMAINS



## DEFEND THE NETWORK

- Cyber Hacks
- Denied Environments

## EXPEDITIONARY COMMS

- Remote Locations
- Highly Contested
- Device Agnostic
- Low Signature

## Adversary Impact

- Capability / Threat
- Task / Purpose
- Intelligence

## Non-Materiel Enablers / Constraints

- Doctrine
- Training
- Policy / Authority
- Task / Purpose

# S&T Engagement Tools

S&T ACTIVITY	OPPORTUNITY	ENGAGEMENT
<p><b>SOF Innovation Foundry Events</b> POC: Shawn Martin 813-825-4578, <a href="mailto:shawn.martin@socom.mil">shawn.martin@socom.mil</a></p>	<ul style="list-style-type: none"> <li>S&amp;T has developed an S&amp;T Futures Process</li> <li>S&amp;T conducts “Innovation Foundry” events to enable SOF’s ability to accomplish their missions 10-15 years in the future</li> </ul>	<ul style="list-style-type: none"> <li>S&amp;T plans to conduct 1-2 SOF Innovation Foundry Events per Fiscal Year</li> <li>Innovation Foundry events will provide opportunities for attending and injecting disruptive technology solutions for SOF</li> </ul>
<p><b>Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)</b> POC: Mr. Anthony Aldrich 813-826-9150, <a href="mailto:anthony.aldrich@socom.mil">anthony.aldrich@socom.mil</a></p>	<ul style="list-style-type: none"> <li>S&amp;T manages SOCOM’s SBIR/STTR programs</li> <li>Stimulates innovation for small businesses</li> <li>3 Phases, Phase I is a Study (\$150K), Phase II Prototype (\$1.5M), Phase III Commercialization</li> </ul>	<ul style="list-style-type: none"> <li><a href="https://www.socom.mil/SOF-ATL/Pages/sbir.aspx">https://www.socom.mil/SOF-ATL/Pages/sbir.aspx</a></li> <li>USSOCOM participates in three SBIR/STTR Topics Call per year (April, August, and December timeframes)</li> </ul>
<p><b>Technical Experimentation (TE) Events</b> POC: Mr. Dan Bernard 813-826-9917, <a href="mailto:dan.bernard@socom.mil">dan.bernard@socom.mil</a></p>	<ul style="list-style-type: none"> <li>Conducts 3 US-based events every fiscal year each with different theme(s)</li> <li>Industry opportunity to engage and demonstrate technology/concepts and get direct feedback from SOF Operators/Acquisition Professionals</li> </ul>	<ul style="list-style-type: none"> <li>Normally 1 TE Event/QTR, TE Request for Information (RFI) posted on <a href="http://FBO.gov">FBO.gov</a> for each TE Event</li> <li>Go to <a href="https://www.socom.mil/SOF-ATL/Pages/technical-experimentation.aspx">https://www.socom.mil/SOF-ATL/Pages/technical-experimentation.aspx</a></li> </ul>
<p><b>Cooperative Research &amp; Development Agreements (CRADA)</b> POC: Mr. Howard Strahan 813-826-1267, <a href="mailto:howard.strahan@socom.mil">howard.strahan@socom.mil</a></p>	<ul style="list-style-type: none"> <li>SOCOM employs Overarching and Specific (Traditional) CRADAs</li> <li>Legal agreement to provide general and specific access to USSOCOM needs</li> </ul>	<ul style="list-style-type: none"> <li>Allows for the formulation and execution of Individual Work Plans (IWP) between the Collaborator – PEO/Directorate within SOF AT&amp;L</li> </ul>
<p><b>Broad Agency Announcements (BAA)</b> POC: Mrs. Damian Guinn 813-826-7416, <a href="mailto:damian.guinn@socom.mil">damian.guinn@socom.mil</a></p>	<ul style="list-style-type: none"> <li>SOCOM S&amp;T Directorate/PEOs develop and post BAAs to <a href="http://FBO.gov">FBO.gov</a> that provide Areas of Interest (AOI) to Industry and other External Organizations</li> </ul>	<ul style="list-style-type: none"> <li>S&amp;T BAA once per year in April</li> <li>TALOS BAA once per year in January</li> <li>Biomedical BAA once per year in February through US Army</li> </ul>
<p><b>Vulcan</b> POC: Mr. Howard Strahan 813-826-1267, <a href="mailto:howard.strahan@socom.mil">howard.strahan@socom.mil</a></p>	<ul style="list-style-type: none"> <li>Web-based platform that enables anyone to quickly describe technology and upload supporting documentation to a secure, shared, searchable, central database</li> </ul>	<ul style="list-style-type: none"> <li>Vulcan supports evaluation/ assessment/scoring of submitted technologies, and sharing of results</li> <li>Go to <a href="http://www.vulcan-sof.com">www.vulcan-sof.com</a> and register</li> </ul>
<p><b>Technology &amp; Industry Liaison Office (TILO)</b> POC: Mrs. Shelvin Watts 813-826-1269, <a href="mailto:shelvin.watts@socom.mil">shelvin.watts@socom.mil</a></p>	<ul style="list-style-type: none"> <li>Conduit for the SOF AT&amp;L Enterprise</li> <li>Matches your company’s product/service/capability to the appropriate personnel within the command and schedules discussions or demos</li> </ul>	<ul style="list-style-type: none"> <li>Go to <a href="https://www.socom.mil/SOF-ATL/Pages/submit-your-idea.aspx">https://www.socom.mil/SOF-ATL/Pages/submit-your-idea.aspx</a> for information and link to USSOCOM Areas of Interest and for the TILO Submitting Your Idea Form</li> </ul>

# Acquisition Agility:



## New Processes

### Rapid Prototyping



ThunderDrone Rapid Prototyping Event: Warfighter Council

### Collaboration Events



LTATV Industry Collaboration

### OpenWerx Challenges



Prize Challenges

### Academic Interns



### Industry Fellows



Additive Manufacturing  
3-D Printing Training

## New Products

### MedRZR- Litter Carrying



### Interceptor & Scalable Drones

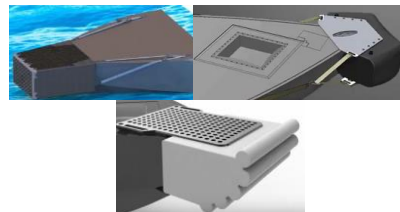


### C4 Communications Suite for LTATV

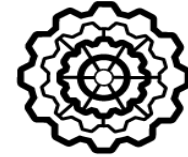


Mobility C4

### Combatant Craft Bow Bumpers



## New Networks



### ECOSYSTEM

Small Business

Academia

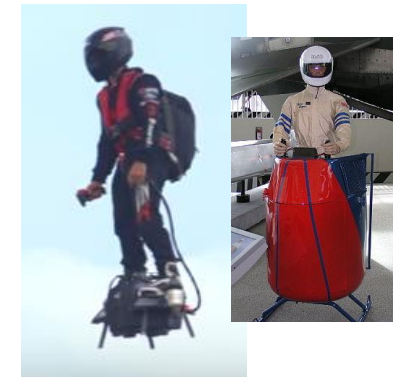
Futurists

Citizen Scientists

400+ Hacker/Maker

## New Ideas

Single Man Flying Machines





# USSOCOM CRADAs

## OVERARCHING CRADA

- Formulated to provide general access to USSOCOM gaps/needs to foster collaboration – must be consistent with missions of organization
- Allows for the formulation and execution of Individual Work Plans (IWP) between the Collaborator – PEO/Directorate within SOF AT&L
- Collaborator may request meetings with appropriate personnel to discuss IWP development – through the SOF AT&L Technical POC
- SOF AT&L Acquisition Executive signed – company coordination and acceptance – generally 30 days

## SPECIFIC (TRADITIONAL) CRADA

- Formulated to provide a collaboration on a specific technology
- Follows USSOCOM Directive 70-1 Appendix Q procedures
- Standard Template
- Specifically between collaborator and single PEO/Directorate
- Writing and staffing is generally 90 to 120 days





# Vulcan-Technology Scouting Application


- **Web-based platform that enables anyone to quickly describe technology and upload supporting documentation to a secure, shared, searchable, central database**
  - Information is entered into a “Scout Card”
  - Scout Cards can be easily disseminated across the SOF enterprise to individuals or teams
  - Enables everyone in SOF to be a Tech Scout
- **Government users can remotely “poke” the organization or individual who originally entered the data to provide updates/respond to comments**
- **Vulcan supports evaluation/assessment/scoring of submitted technologies, and sharing of results**
- **Each time a Scout Card is interacted with it has an associated timeline showing technology maturation across events**



Go to [www.vulcan-sof.com](http://www.vulcan-sof.com) and register

Vulcan provides an exponential increase in efficiency and effectiveness over existing business processes for gathering, disseminating, searching, assessing and acting on technology related information.

# Technical Experimentation (TE)

- **18-2, 26-30 March 2018 at Camp Atterbury-Muscatatuck Center for Complex Operations, IN**
  - Experimentation Focus: Long Range Facial Recognition and Chemical Attribution, Neuro-Cognitive Enhancements, and Optics
- **TE 18-3, 17-21 July 2018 at Fort A.P. Hill, VA**
  - Experimentation Focus: C4, Cyber, ISR, Mobility, and Small Unmanned Aerial Systems (SUAS)
- **Public Link:**  
<http://www.socom.mil/SOF-ATL/Pages/technical-experimentation.aspx>
- **Linked  Group: SOCOM Technical Experimentation**



# Our Blueprint

Set unreasonable expectations

Execute an elastic business definition

A cause, not a business

Embrace and listen to new voices

Enable a market for innovation

Exploit low-risk experimentation

Create and exercise the network

*USSOCOM acquisition ... light, agile, lethal: a pathfinder for DoD acquisition reform:*

*USSOCOM leads the way by focusing on modifying organization culture rather than processes - GLENDA H. SCHEINER*



*LEADING THE REVOLUTION - GARY HAMEL*

# Adapt or Die







# QUESTIONS?





# BACKUP

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# S&T Medical Technology Success

**Uncontrolled hemorrhage is the leading cause of preventable combat-related deaths. The vast majority of these deaths occur in the field before the injured can be transported to a treatment facility. Early control of hemorrhage remains the most effective strategy for treating combat casualties.**

1998

**Hemostatic Agents in Uncontrolled Hemorrhage – Proof of Concept Studies. (USSOCOM S&T Projects)**

2003

**Hemostatic Dressing Device and Protocol – 2500+ delivered to SOF**



2005

**Department of Air Force/SGO CENTCOM CENTAF Selection of Hemostatic Agent for New Individual First Aid Kits (HemCon, QuikClot)**



**HemCon Bandage (Chitosin) to Special Operations Forces**

2007

**SOF Tactical Combat Casualty Care Kits (CDD)**

