AGENDA

TUESDAY, FEBRUARY 5

10:00 am – 7:00 pm

REGISTRATION
INDEPENDENCE FOYER

1:00 – 1:05 pm

OPENING REMARKS
REGENCY BALLROOM EF

Dana Hudson
Chair, NDIA SO/LIC Division

Gen Hawk Carlisle, USAF (Ret)
President & CEO, NDIA

1:05 – 1:30 pm

KEYNOTE
REGENCY BALLROOM EF

The Honorable Scott Taylor
Former U.S. House of Representatives

1:30 – 2:30 pm

RAPID PROTOTYPING IN SOF EQUIPPING
REGENCY BALLROOM EF

Daniel Cabel, USN (Ret)
Special Operations Liaison, Naval Surface Warfare Center
Moderator

Brent Andberg
Rapid Prototyping Strategic Capabilities Office

Tambrein Bates
Director, SOFWERX

John Lazar
Director, Rapid Reaction Technology Office

Brooke Pyne
ODTA, Tech Transfer (T2), Naval Surface Warfare Center

2:30 – 3:00 pm

SOF'S ROLE IN IRREGULAR WARFARE
REGENCY BALLROOM EF

Andrew Knaggs
Deputy Assistant Secretary of Defense for Special Operations and Combating Terrorism

3:00 – 3:30 pm

NETWORKING BREAK
REGENCY BALLROOM FOYER

3:30 – 4:30 pm

EVOLUTIONS IN THE CYBER DOMAIN
REGENCY BALLROOM EF

MG Patrick Higgins, USA (Ret)
Vice President, Business Development, Goldbelt, Inc.
Moderator

BGen Dennis Crall, USMC
Deputy Principal Cyber Advisor, Office of the Assistant Secretary of Defense for Cyber Policy

Jen Edgin, SES
USMC Chief Technology Officer,
Deputy Commandant for Information (DC-I)

Robyn Klein, Ph.D.
Acting Director, Plans and Operations, Office of the Assistant Secretary of Defense for Cyber Policy

MAJ Anthony Stephens, Sr., USA
Chief Information Officer, Golbelt Hawk, LLC
Commanding Officer, 144th Cyber Warfare Company, Army National Guard

4:30 – 5:00 pm

A CONVERSATION WITH ASD SO/LIC

REGENCY BALLROOM EF

Owen West
Assistant Secretary of Defense,
Special Operations/Low-Intensity Conflict

Dana Hudson
Chair, NDIA SO/LIC Division

5:00 – 6:30 pm

NETWORKING SOCIAL IN THE EXHIBIT HALL

INDEPENDENCE BALLROOM

6:30 pm

KEYNOTE ADDRESS & AWARDS DINNER

REGENCY BALLROOM EF

LTG Paul Ostrowski, USA
Principal Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics and Technology) and Director of the Army Acquisition Corps

VADM Joseph Maguire, USN (Ret)
DeProspero Award Recipient

ADM Eric Olson, USN (Ret)
Rylander Award Recipient

WEDNESDAY, FEBRUARY 6

7:00 am – 5:00 pm

REGISTRATION

INDEPENDENCE FOYER

7:00 – 8:00 am

NETWORKING BREAKFAST

REGENCY BALLROOM FOYER

8:00 – 8:05 am

OPENING REMARKS

REGENCY BALLROOM EF

Dana Hudson
Chair, NDIA SO/LIC Division

8:05 – 8:35 am

KEYNOTE

REGENCY BALLROOM EF

The Honorable Michael Waltz
U.S. House of Representatives

8:35 – 9:05 am

KEYNOTE

REGENCY BALLROOM EF

James Smith, SES
Acquisition Executive, U.S. Special Operations Command

9:05 – 11:00 am

RAPID ACQUISITION IN THE REAL WORLD – FIELDING QUICKLY FOR THE WARFIGHTERS' REAL TIME NEEDS

REGENCY BALLROOM EF

LCDR Jeff Williams, USN (Ret)
President and CEO, Strategos Consulting, LLC
Moderator

COL Joel Babbitt, USA
Program Executive Officer, SOF WARRIOR,
U.S. Special Operations Command

Col Melissa Johnson, USAF
Program Executive Officer, Fixed Wing,
U.S. Special Operations Command

Margaret McCaskey
Program Executive Officer,
Special Reconnaissance, Surveillance and Exploitation,
U.S. Special Operations Command

9:30 am – 4:00 pm

EXHIBIT HALL OPEN

INDEPENDENCE BALLROOM

11:00 – 11:30 am

NETWORKING BREAK IN THE EXHIBIT HALL

INDEPENDENCE BALLROOM

11:30 – 12:30 pm

ARTIFICIAL INTELLIGENCE, ROBOTICS, AND UNMANNED TECHNOLOGY PANEL

REGENCY BALLROOM EF

RADM Brian Losey, USN (Ret)
Partner, Shield AI
Moderator

CDR Kevin Baugh, USN (Ret)
President and CEO, KinowledgeBridge International Inc.

Mike Kramer, Ph.D.
Technology and Strategy Branch,
Joint Improvised Defeat Organization

Shane Shaneman
Director, Strategic Government Research & Engagements,
Carnegie Mellon University

Nick Wager, Ph.D.
Defense Threat Reduction Agency

12:30 – 1:30 pm

NETWORKING LUNCH IN THE EXHIBIT HALL

INDEPENDENCE BALLROOM

1:30 – 2:30 pm

HUMAN PERFORMANCE

REGENCY BALLROOM EF

Jared Ross
Asymmetric Operations Group
Moderator

The Honorable Michael Lumpkin
Senior Vice President, Human Performance
and Behavior Health, Leidos

Dr. Patty Deuster, MPH, CNS
Professor and Director, Consortium for
Health & Military Performance (CHAMP)

Kevin C. O'Connor, D.O., FAAFP
Director, Executive Medicine,
The GW Medical Faculty Associates

Phil Wagner, M.D.
Founder and CEO, Sparta Science

2:30 – 3:30 pm

COUNTERING WEAPONS OF MASS DESTRUCTION

REGENCY BALLROOM EF

Chris Royse
Senior Director, Business Development, MRI Global
Moderator

Greg Isbill
Nuclear Engineer, Leidos Intelligence Solutions

Kenneth Myers
Senior Vice President, National Security Solutions PAE

Robert Peters
Senior Research Fellow, Center for the Study of Weapons of Mass Destruction, National Defense University

3:30 – 4:00 pm

NETWORKING BREAK IN THE EXHIBIT HALL

INDEPENDENCE BALLROOM

THURSDAY, FEBRUARY 7

8:00 am – 12:00 pm

REGISTRATION

INDEPENDENCE FOYER

8:00 – 11:00 am

EXHIBIT HALL OPEN

INDEPENDENCE BALLROOM

8:00 – 9:00 am

NETWORKING BREAKFAST IN THE EXHIBIT HALL

INDEPENDENCE BALLROOM

9:00 – 9:05 am

OPENING REMARKS

REGENCY BALLROOM EF

Dana Hudson
Chair, NDIA SO/LIC Division

9:05 – 9:35 am

KEYNOTE

REGENCY BALLROOM EF

Lisa Sanders, SES
Director, Science and Technology, U.S. Special Operations Command

9:35 – 10:35 am

THE FUTURE OF THE DIGITAL BATTLEFIELD

REGENCY BALLROOM EF

Lisa Sanders, SES
Director, Science and Technology,
U.S. Special Operations Command
Moderator

CDR James Clark, USN
SOF Program Manager, Strategic Capabilities Office

Patricia Herndon, SSTM
Director, Special Warfare and Expeditionary Systems Department

Charles Perkins, Ph.D.
Principal Deputy, Emerging Capability & Prototyping

10:35 – 11:00 am

NETWORKING BREAK IN THE EXHIBIT HALL

INDEPENDENCE BALLROOM

11:00 am – 12:00 pm

SOF'S ROLE IN ADDRESSING GLOBAL NEAR PEER ADVERSARIES AND TECHNOLOGIES

REGENCY BALLROOM EF

LTC Mark Owens, USA (Ret)
Executive Vice President, Business Development, True Velocity
Moderator

Col Bryan Cannady, USAF
Chief Innovation Officer (and Founder), Air Force Warfighting Integration Capability

AVM Alan Clements
Head Australian Defence Staff and Defence Attaché, Embassy of Australia

COL Magne Rodahl, RNoA
Defense Attaché, Royal Norwegian Embassy

12:00 pm

CLOSING REMARKS

REGENCY BALLROOM EF

Dana Hudson
Chair, NDIA SO/LIC Division

NDIA has a policy of strict compliance with federal and state antitrust laws. The antitrust laws prohibit competitors from engaging in actions that could result in an unreasonable restraint of trade. Consequently, NDIA members must avoid discussing certain topics when they are together at formal association membership, board, committee, and other meetings and in informal contacts with other industry members: prices, fees, rates, profit margins, or other terms or conditions of sale (including allowances, credit terms, and warranties); allocation of markets or customers or division of territories; or refusals to deal with or boycotts of suppliers, customers or other third parties, or topics that may lead participants not to deal with a particular supplier, customer or third party.


SOFWERX

Under a Title 15 Partnership Intermediary Agreement (PIA):

"Big Tent" philosophy which includes:

- SOCOM
- Inter Agency Partners
- Industry Partners/Fellows
- FFRDC's/Labs
- Academics/Interns
- Hackers/Makers

Metrics Matter

Nominations	Activity		Impact
51 x Component	26 x Collab. Project Orders	106 x Projects	176 x Agreements
18 x J-Code	7 x Rapid Prototyping Events	41 x Capability Collaboration Events	271 x Knowledge Transfers
89 x SOF AT&L	7 x Hackathons	36 x STEM Events	116 x Validations
91 x SOFWERX Initiated	14 x Capability Assessment Events	22 x Prize Challenges	38 x Consignments
78 x Warfighter	6 x Tech Expos	24 x Tech Talks	10 x Transitions to PoR

Rapid Reaction Technology Office (RRTO) Overview

Jon Lazar
jon.e.lazar.civ@mail.mil
703.697.4084

RRTO Operating Model

- **RRTO develops prototypes to increase the speed from idea to developed capability, leading to a more lethal, resilient, and rapidly innovating Joint Force**
  - **Technology areas reflect National Defense Strategy and USD(R&E) modernization priorities**
  - **Seeks innovative ideas from small businesses; traditional and non-traditional performers; academia; CCMDs; Services; government labs; FFRDCs & UARCs**
  - **Proposals accepted on a rolling basis**
  - **Streamlined process for funding consideration**
  - **Awards made throughout the year of execution**

Guiding principles

1. **Aligned to DoD modernization priorities**
2. **Joint**
3. **Innovative, leap-ahead technologies**
4. **Co-funding from government stakeholders**
5. **Clear transfer/transition path**

A culture of innovation delivered at the speed of war

RRTO Prototyping Initiatives

Emerging Capabilities Technology Development (ECTD)

- Conceptual prototypes aligned with the "Road to Dominance" modernization plan
  - Pursues risk-reducing technology prototypes and demonstrations of cutting-edge land, sea, air, and space systems for the Joint Warfighter
  - Demonstrates art of the possible; < 36 months, < $6M
  - Rolling start during execution year **accelerates cycle of innovation**

Quick Reaction Special Projects (QRSP)

- Operational prototypes that deliver quick wins to the warfighter
  - Matures emerging technologies for operational use by the Joint Warfighter
  - Delivers innovative prototypes to help address immediate needs; 12-18 months, < $1M
  - Rolling start during execution year to **increase speed of delivery**

Rapid Prototyping Program (RPP)

- Operational Prototypes that accelerate innovation within Services' programs
  - Develops prototypes that drive down risk and **foster creative operating concepts**
  - Anticipate and respond to emergent Service and Agency issues and time-sensitive threats by selecting projects within the year of execution.
  - Annual call for proposals; FY2018 projects averaged <24 months and <$10M

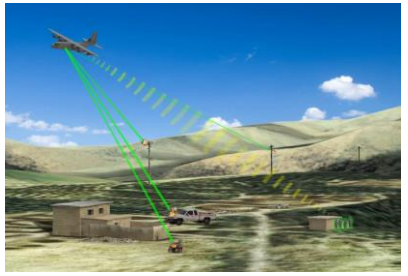
Increased emphasis on National Defense Strategy and USD(R&E) modernization areas

Example Prototyping Efforts

- **Persistent Aerial Recon. & Communications (PARC)**
  - 24/7 ISR via ultra-lightweight low-tension power/data wire
  - Autonomous launch, flight, and recovery
  - Transitioned to SOCOM, Army Rapid Equipping Force

- **High Accuracy Video Object Classification (HAVOC)**
  - Expeditionary automated target recognition for full motion video
  - New classifiers require 100s or 1000s of samples, not millions
  - End users can create new classifiers and train algorithms in the field
  - Algorithms incorporated into Project Maven

- **AC-130 High Energy Laser (HEL)**
  - OSD risk reduction in key technology areas
  - Work accelerates SOCOM program; foundational for other DE work
  - Overall program completes with operational system in FY 2022

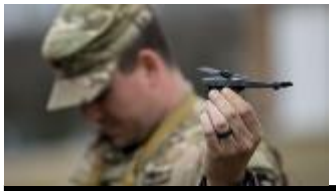


- **Accelerated Nuclear DNA Equipment (ANDE)**
  - Processes DNA samples and matches to terrorist database
  - Replaces expeditionary lab with a fieldable laser printer size device
  - Transitioned to SOCOM, DHS, DoJ

Demonstration/Experimentation Venues


High Speed, Electronic Keel Marine Testbed

Stiletto is a maritime technology demonstration platform with an "electronic keel" that enables rapid integration, demonstration, and experimentation with new technologies. The 88-foot experimental boat provides an authentic military maritime platform with easy access for small businesses and non-traditional performers. In FY 2018, Stiletto demonstrated 68 technologies, including systems from 23 small businesses.




Multi-Intelligence & ISR Technology Demonstration Venue

Thunderstorm is an enduring technology demonstration venue open to a wide range of participants, including small businesses, military, and the interagency. New technologies can be integrated, evaluated, and assessed under real world conditions with scripted and unscripted scenarios. In FY 2018, Thunderstorm demonstrated 87 technologies, including systems from 52 small businesses.


Joint Interagency Field Experimentation (JIFX)

JIFX demonstrates and evaluates new technologies related to Department of Defense research in an operational field environment. JIFX also provides the operational community an opportunity to experiment with these technologies to better understand their capabilities and how to use them. Together this creates a collaborative, boundary-pushing environment to explore the implications and applications of emerging technology.


Technical Support & Operational Analysis Activity (TSOA)

TSOA conducts scenario-based live field experiments and assessments in operationally relevant venues to help identify vulnerabilities and system limitations in new technologies. With a focus on new technologies emerging from Service/DoD labs, TSOA delivers rigorous technology assessments from the perspective of both the operator and the adversary to uncover these vulnerabilities.

RRTO Prototyping Resources

- **RRTO Proposals**
  - www.acq.osd.mil/ecp/programs/rrto.html
- **RRTO Demonstration Venues**
  - thunderstorm@arl.psu.edu (Thunderstorm)
  - stiletto@navy.mil (Stiletto)
  - http://www.nps.edu/web/fx/ (JIFX)
  - https://uniquemissioncell.org (TSOA)
  - …and on fedbizopps.gov
- **DoD Prototyping Guidebook**
  - https://www.dau.mil/tools/t/DoD-Prototyping-Guidebook
- **Jon Lazar**
  - jon.e.lazar.civ@mail.mil
  - 703.697.4084

FLC

Federal Laboratory Consortium for Technology Transfer

THE FLC: ACCESSING FEDERAL RESOURCES THROUGH T2

Brooke Pyne
NSWC Crane Technology Transfer (T2) Director
MidWest Regional Director, Federal Laboratory Consortium

FLC
Federal Laboratory Consortium for Technology Transfer

WHAT IS FEDERAL TECHNOLOGY TRANSFER (T2)?

Legislative Purpose of T2:

- Improve the economic, environmental and social well being of the US, by
- Leveraging innovation developed with tax payer $$ in the Federal Labs
- Federal technology transfer
    - Results in commercialization of new products
    - Enhances laboratory and/or agency mission objectives

Lab's "Shareable Assets"

- Knowledge (IP, Tech Data)
- Technical Experts (SMEs)
- Specialized Equipment
- State of the Art Facilities

FLC
Federal Laboratory Consortium for Technology Transfer

WHAT IS FEDERAL LAB CONSORTIUM - FLC?

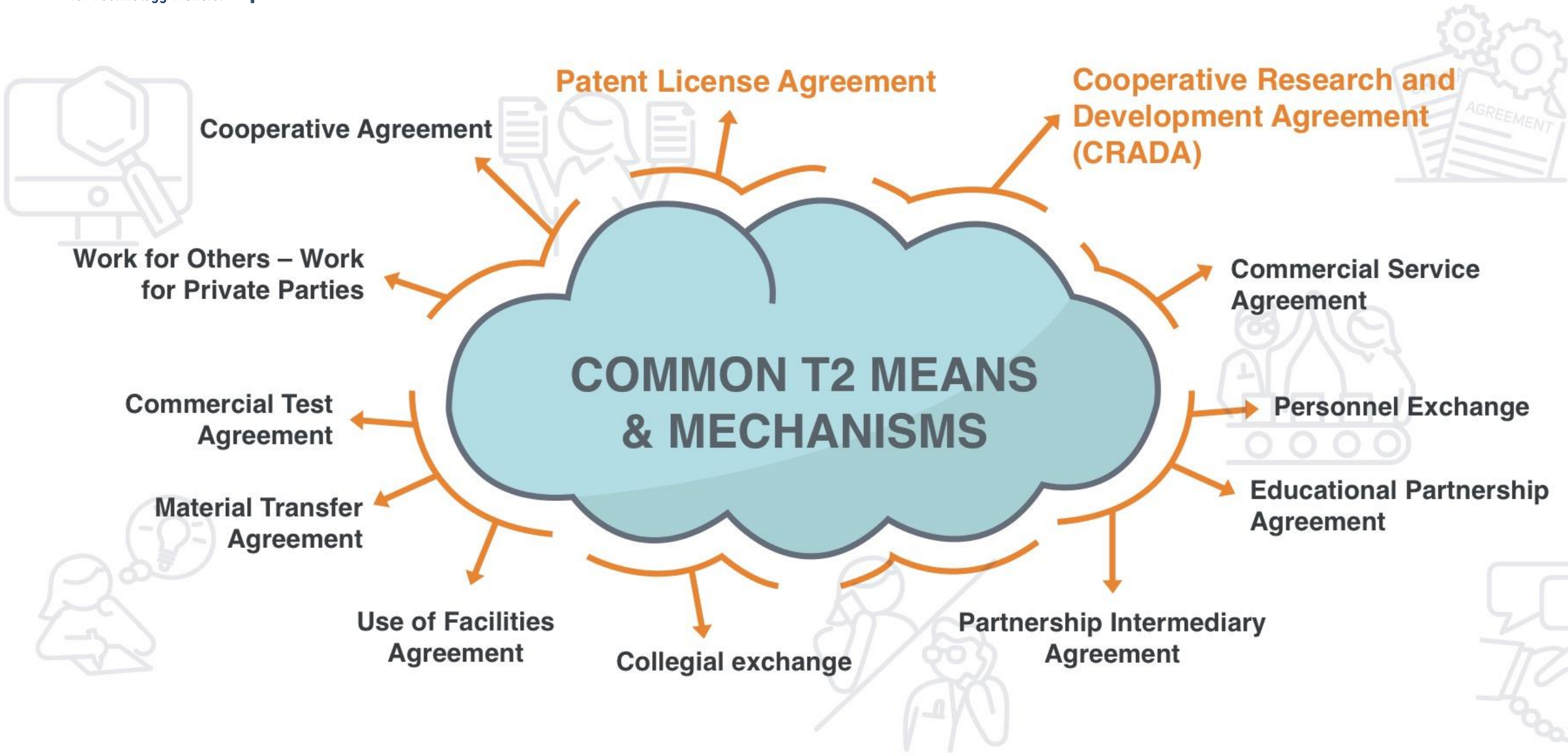
The FLC's mission is to ***promote, educate, and facilitate*** **federal technology transfer** (T2) among its member labs and institutions so they can easily reach their commercialization goals, and create social and economic impacts with new, innovative technologies.

PROMOTE

EDUCATE

FACILITATE

FLC
Federal Laboratory Consortium for Technology Transfer



FLC
Federal Laboratory Consortium for Technology Transfer

OUR TRANSACTIONAL METRICS

300+ Federal Labs

QUICK MACRO (2014-PRESENT)

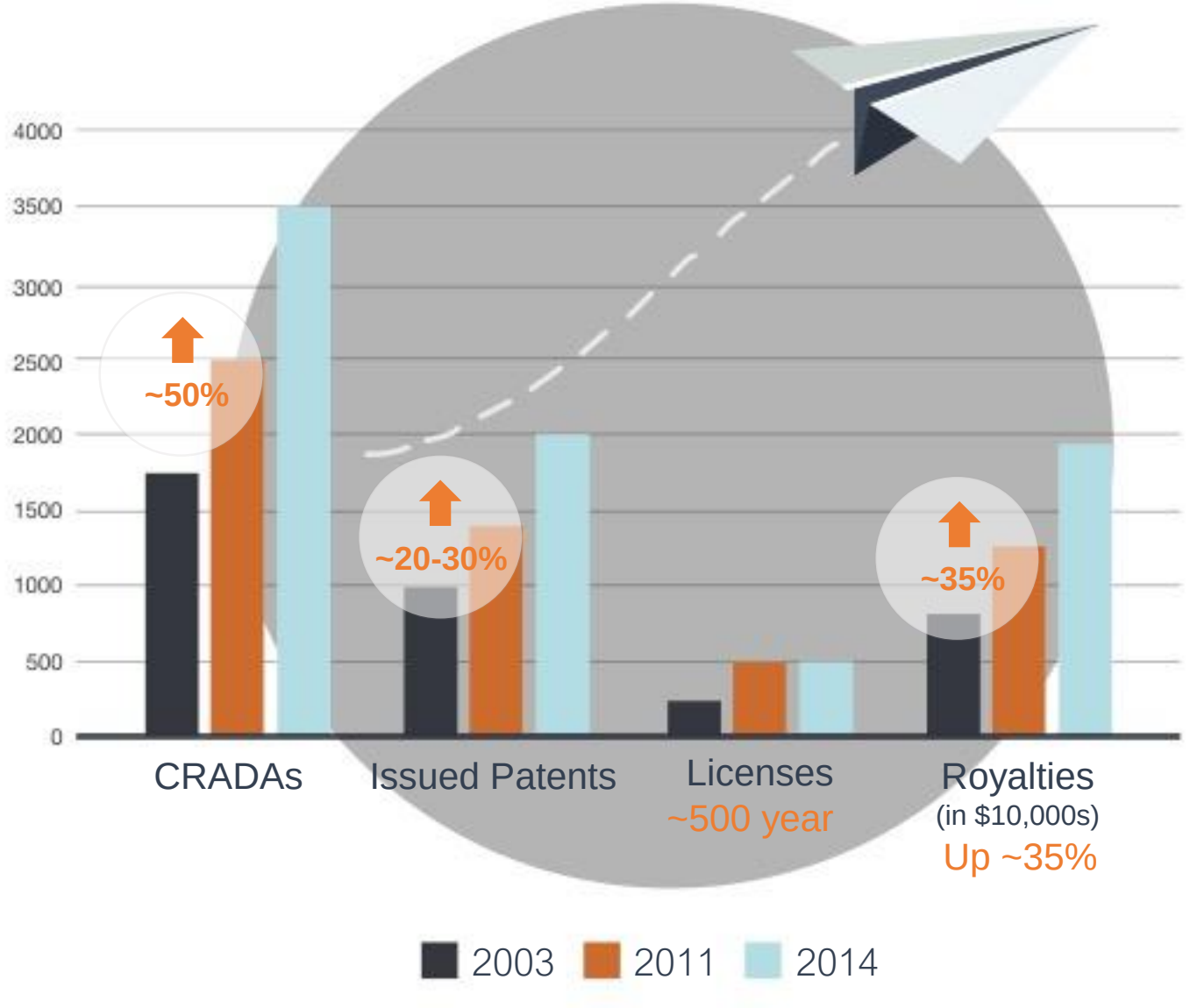
THE STORY IS:

CRADAs
~50% increase in the past 12 years averaging 3,500 new agreements per year

Patents Issued
~20-30% increase since 2011 averaging 2,000 per year

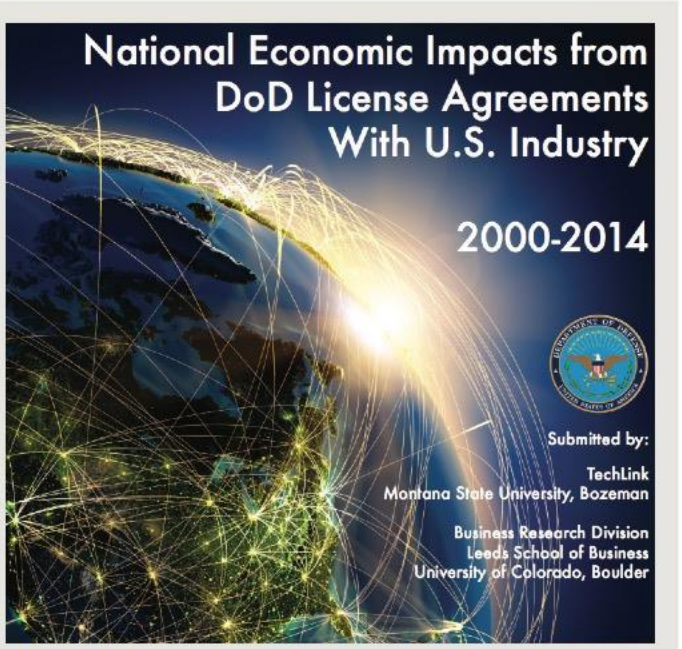
Licenses (inventions)
~500 per year; Anomaly that it has flattened out?

Royalties - $194M
Up 35% since 2011; Mostly pharma/medical
BUT royalties is **NOT** the goal!



FLC
Federal Laboratory Consortium for Technology Transfer

INNOVATION GENERATES ECONOMIC GROWTH



TechLink Study: 663 DoD Licenses Results

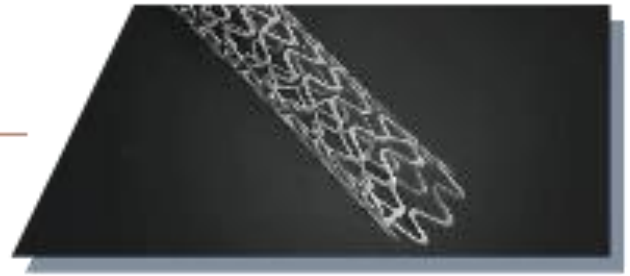
https://techlinkcenter.org/2016-report-economic-impact-dod-licensing-2000-2014/

FLC
Federal Laboratory Consortium for Technology Transfer

TECHNOLOGY TRANSFER IN YOUR LIFE

CASE STUDY: PtCr ALLOY CORONARY STENTS

AGENCY	LABORATORY	COMPANY	SUCCESSFUL TRANSFER
	NATIONAL ENERGY TECHNOLOGY LABORATORY	Boston Scientific	Platinum Chromium (PtCr) stents



CASE STUDY: INVISIBLE BRACES

AGENCY	LABORATORY	COMPANY	SUCCESSFUL TRANSFER
NASA	USC University of Southern California	ceradyne, inc. 3M Unitek	Transcend® Invisible Braces

CASE STUDY: SIRI

AGENCY	LABORATORY	COMPANIES	SUCCESSFUL TRANSFER
	DARPA	SRI International, Siri, EPFL	Apple Siri® Intelligent Personal Assistant

FLC
Federal Laboratory Consortium for Technology Transfer

HOW CAN THE FLC HELP YOU?

ORGANIZED TO ACCELERATE ACCESS TO FEDERAL RESOURCES AND TECHNOLOGIES

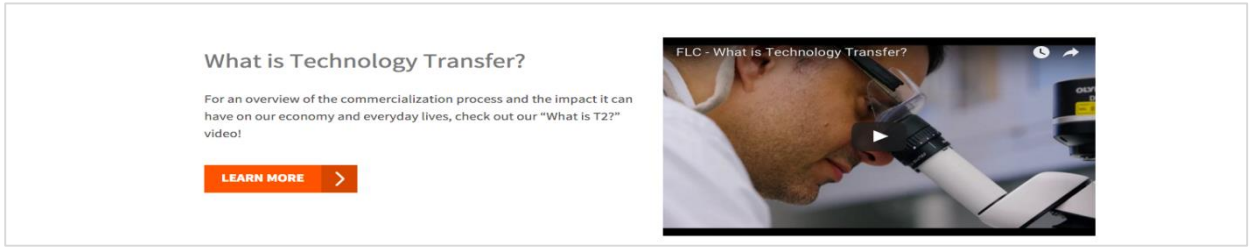
Through FLC-created resources, education, tools and services, our organization provides laboratories and businesses the opportunity to form partnerships, navigate the lab-to-market process, and achieve innovation success.

PROMOTE + **EDUCATE** + **FACILITATE**

Foster lab-to-market strategies, connections and partnerships to accelerate federal technologies into the marketplace.

START HERE - T2 RESOURCES ON FLC WEBSITE

FEDERALLABS.ORG

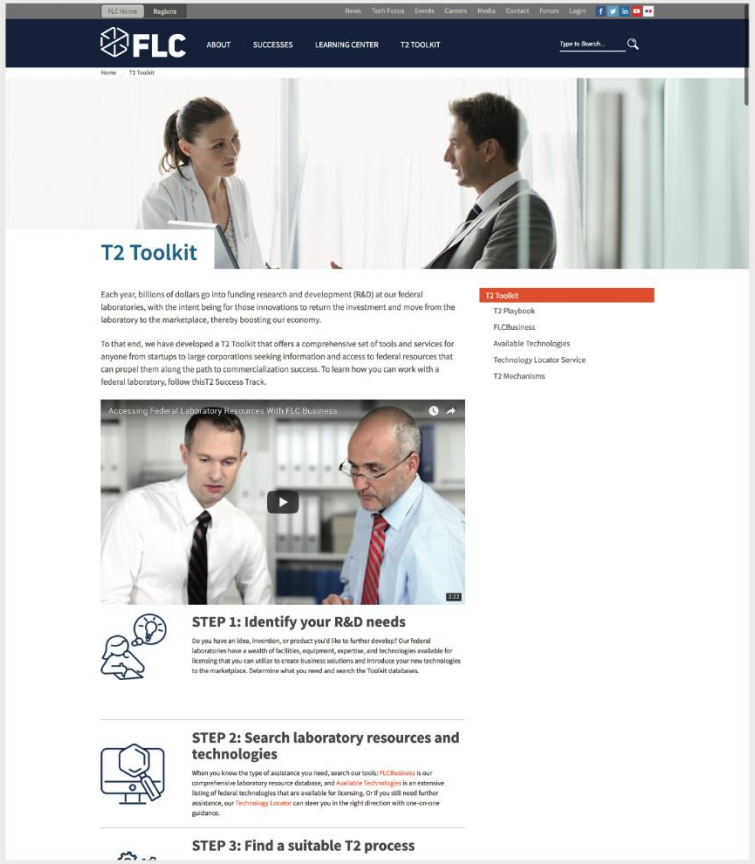


- **Points of Contact**
  Over 300 Agency and Lab points of contact
- **Locate Technologies & Capabilities**
  FLC Businesses, Tech Locator Service, Available Technologies
- **Training and Education**
  FLC Learning Center, On-Demand Training, White Paper resources
- **Reference Materials**
  Green Book, Desk Reference, Annual Publications
- **News & General Information**
  Success Stories, FLC Awards, T2 News, Legislative Updates

FLC
Federal Laboratory Consortium for Technology Transfer

PLATFORMS FOR SUCCESS

T2 Toolkit



Learning Center

FLC Business

FLC
Federal Laboratory Consortium for Technology Transfer

REGIONS POCs

FAR WEST

Jennifer Stewart
Far West Regional Coordinator

NATIONAL

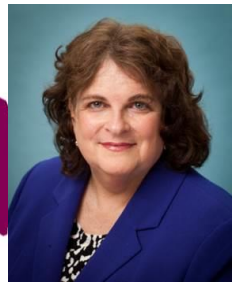
John Dement
National Chair

MID-CONTINENT

Jack James
Mid-Continent Regional Coordinator

MIDWEST

Brooke Pyne
Midwest Regional Coordinator



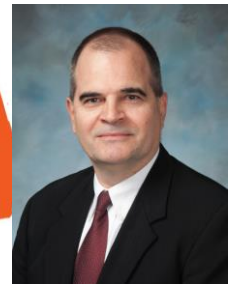
NORTHEAST

Valerie Larkin
Northeast Regional Coordinator

MID-ATLANTIC

Rob Griesbach
Mid-Atlantic Regional Coordinator

SOUTHEAST



Michael Merriken
Southeast Regional Coordinator

FLC
Federal Laboratory Consortium
for Technology Transfer

WHERE TO FIND US

FLCBUSINESS.ORG

TWITTER/FEDERALLABS

LINKEDIN/FEDERALLABS

FACEBOOK/FEDERALLABS

Brooke Pyne
NSWC Crane T2 Director
FLC MidWest Regional Director
P – 812-854-4823
E – Elizabeth.b.pyne@navy.mil

SPECIAL OPERATIONS FORCES ACQUISITION, TECHNOLOGY, & LOGISTICS

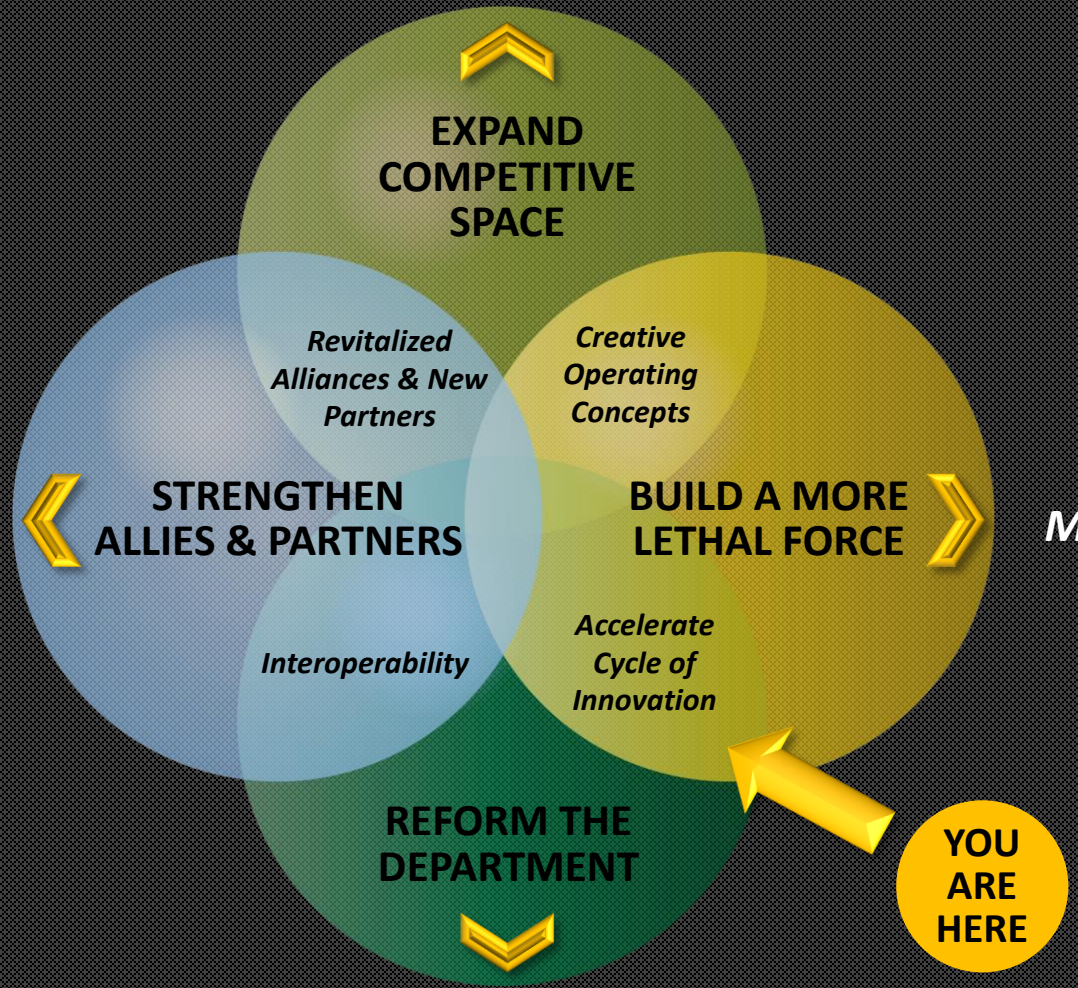
Trusted Experts

Mr. Jim Smith *Acquisition Executive*

SOF AT&L

Strategic Approach & Ways

Generate U.S. Advantage & Adversaries Dilemmas

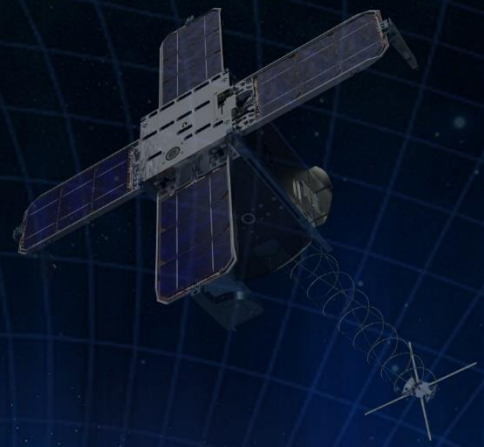


Robust Networks

Military Advantage

Greater Performance & Affordability

Next Generation ISR



Find, Fix, Finish, Exploit and Analyze…

- Faster & improved accuracy
- Use with and through all domains (Air, space, Cyber, Maritime, Ground)
- Constellation of multiple CubeSats and SmallSats containing ISR sensors
- Sensors capable Threat Warning, Tracking, and Data Exfil
- Access to non-permissive environments for intelligence collection

Next Generation Mobility

Increased Survivability
Alternate Precision
Navigation & Timing

Precision Fires & Effects

- Organic loitering precision strike capability
- Backpack, vehicle, maritime, and air launch platforms
- Increased ranges and loiter times
- Multiple munitions
- Common Launch Tube
- Sensor-to-shooter linkage
- Establish industry production base

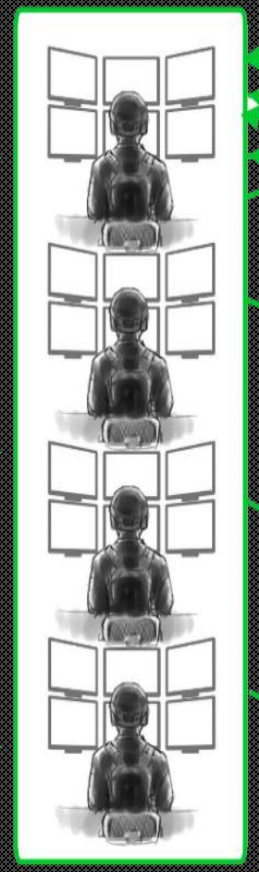
Hyper-Enabled Operators

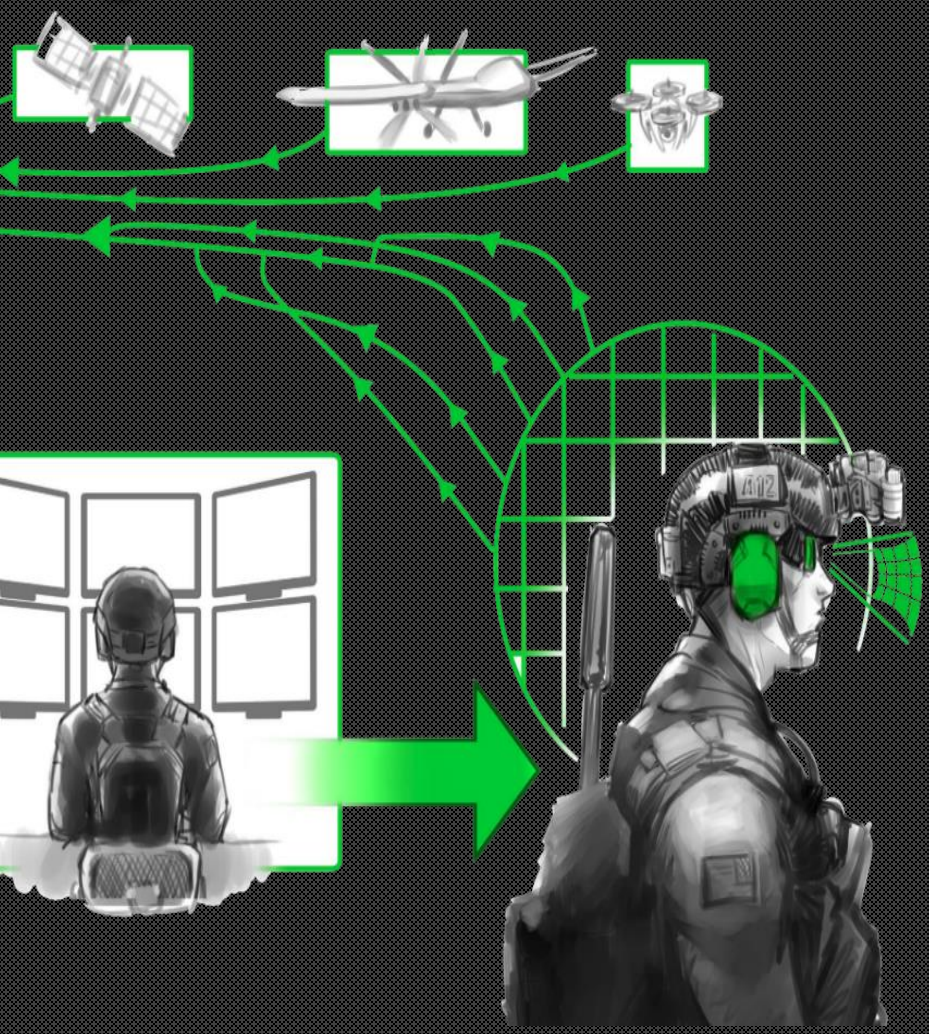
Increased survivability, lethality, and situational awareness

Advanced human-machine interfaces

Improved decision making

Hyper-Enabled Operator
in the Cognitive Domain... at the Edge





Data

Networks & Data

Mobility of the SOF Global Mission Force

Provision Connectivity Anywhere with Anyone

Computing at the Edge

Embedded Multimodal Data Discovery

Artificial Intelligence / Machine Learning

Automatically Discover, Know, Anticipate, Collaborate

Our Relationship in the Information Era

REQUIREMENTS

We've asked you for **PLATFORMS** that carry computers, sensors and comms.
We'll start asking for **C4ISR** that is carried on platforms – *the emphasis matters*

DATA

You'll see an increased emphasis on data. What data is generated?
Who owns it? How accessible is it? (Hint: A lot. I need to… Very… to me)

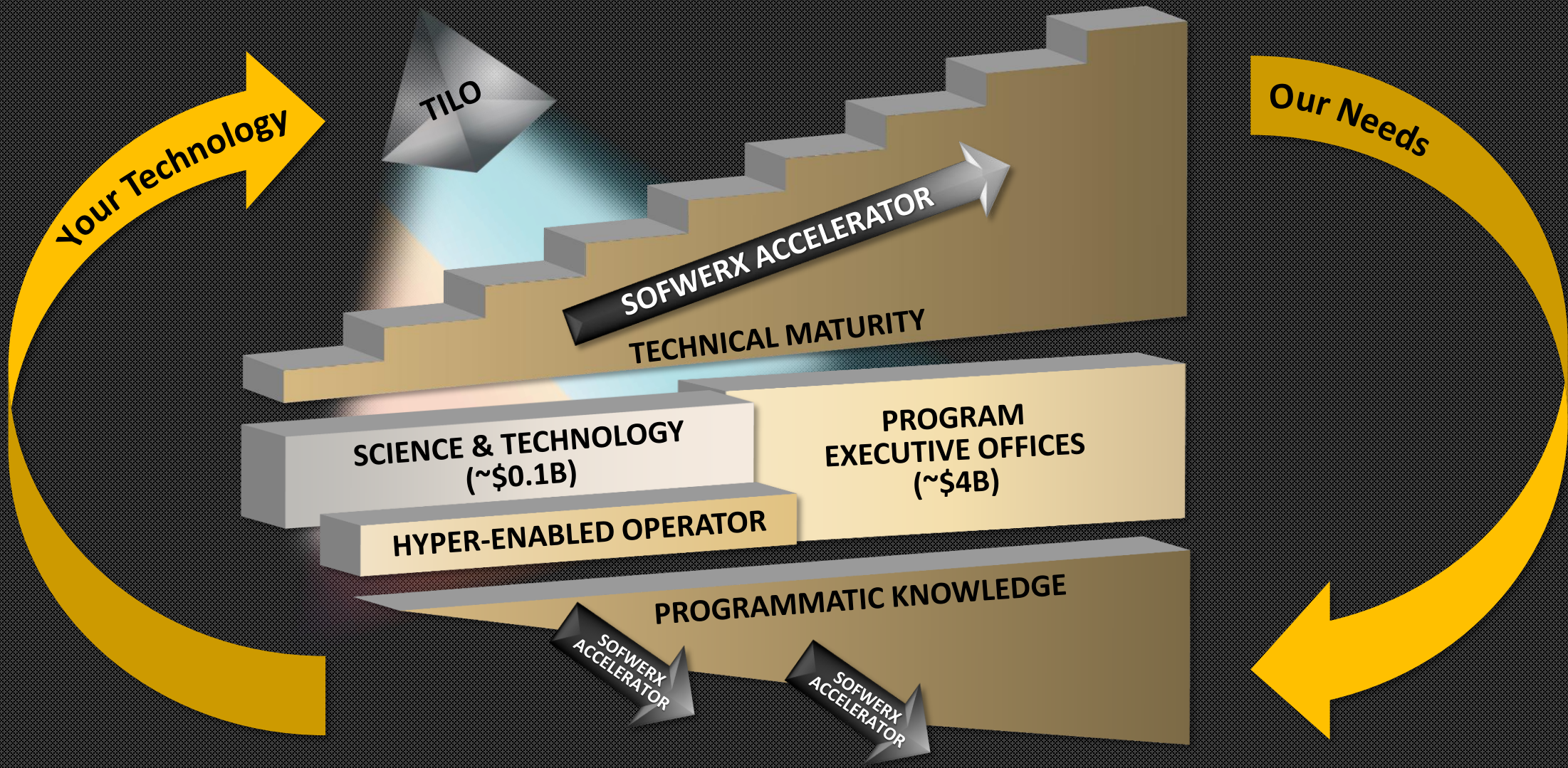
CYBER SECURITY

We'll be more interested in not only how you are protecting our information but also the pedigree of your subs and suppliers.

WHAT'S NEXT

How do we start building AI/ML into our systems now?

Our Needs + Your Technology + (Mgt x Mgt) = Capability
Govt Ind



Your Challenge

We're Starting to Move Faster

Can You Keep Pace?

New Tools/Authorities

SOF are Early Adapters

OTA, Middle Tier Acquisition, CSO…

Transparent

www.socom.mil/SOF-ATL

@SOAExec

Linkedin.com/in/ussocom-ae

SMALL BUSINESS HELP

Christopher Harrington
Director, Office of Small Business Programs
Christopher.Harrington@socom.mil
813.826.9475

SUBMITTING PRODUCTS OR IDEAS

Shelvin Watts
Technology & Industry Liaison Officer
TILO@socom.mil
813.826.9482

VULCAN

https://www.Vulcan-SOF.com

EXPERIMENTATION IDEAS

https://www.socom.mil/SOF-ATL/Pages/technical-experimentation.aspx

Special Operations Forces Warrior – Industry Conference

Portfolio Overview

MOBILITY
"Individual to Heavy Ground Vehicles"

Light Tactical All Terrain Vehicles

Non-Standard Commercial Vehicles

GMV 1.1

Ground Mobility Vehicle (Medium)

MRAP-ATV (Heavy)

SURVIVAL
"Protection, Load Carriage & Medical"

Combat Uniform & Helmets

Body Armor / Load Carriage Sys

Individual & Combat Medic Kits

Casualty Evacuation

LETHALITY
"Munitions, Visual Augmentation, Lasers & Weapons"

Night Vision Goggles

Combat Assault Rifles

M72 LAW Light Assault Weapon

Aviation Ammo

Laser Acquisition Markers

Non-Standard Arms

Sniper Weapons & Accessories

Program Executive Office Fixed Wing (FW)

ISR - FIND


MQ-1C Gray Eagle


MQ-9 Reaper


RQ-20A Puma


MEUAS 1.5


MEUAS 2.0


JAVAMAN


MC-12W


U-28A/PC-12

MOBILITY - INFILTRATE


EC-130J Commando Solo


CV-22 Osprey


C-145A Skytruck


C-146A Wolfhound


MC-130H Talon II


MC-130J Commando II

STRIKE - FINISH


MQ-9 Reaper


MQ-1C Gray Eagle


AC-130U Spooky

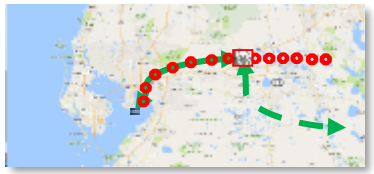

AC-130W Stinger II

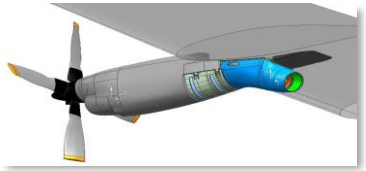

AC-130J Ghostrider


Stand Off Precision Guided Munitions

TECHNOLOGY INSERTION


Sensors


Mission Automation


Survivability


Kinetic Effects / DE

Program Executive Office Special Reconnaissance, Surveillance, and Exploitation (SRSE)

TECHNICAL COLLECTION SYSTEMS

Hostile Forces – Tagging, Tracking, and Locating (HF-TTL)





Tactical Video System/Reconnaissance, Surveillance, and Target Acquisition



Joint Threat Warning System



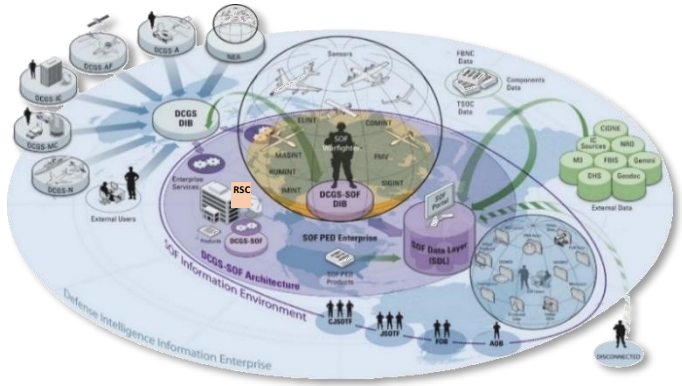
IDENTITY OPERATIONS

Biometrics and Forensics



MISSION SUPPORT SYSTEMS

Processing, Exploitation, & Dissemination



SIGINT PED ♦ GEOINT PED ♦ Big Data PED

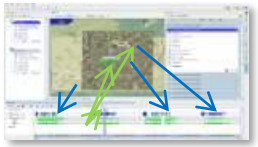
Distributed Common Ground/Surface System (DCGS)-SOF

FOCUSED RDT&E

Tagging, Tracking, and Locating


Specialized Communication

Tactical Exploitation of National Capabilities

Quick Reaction Capabilities

The AI Stack – A Blueprint for Developing & Deploying AI

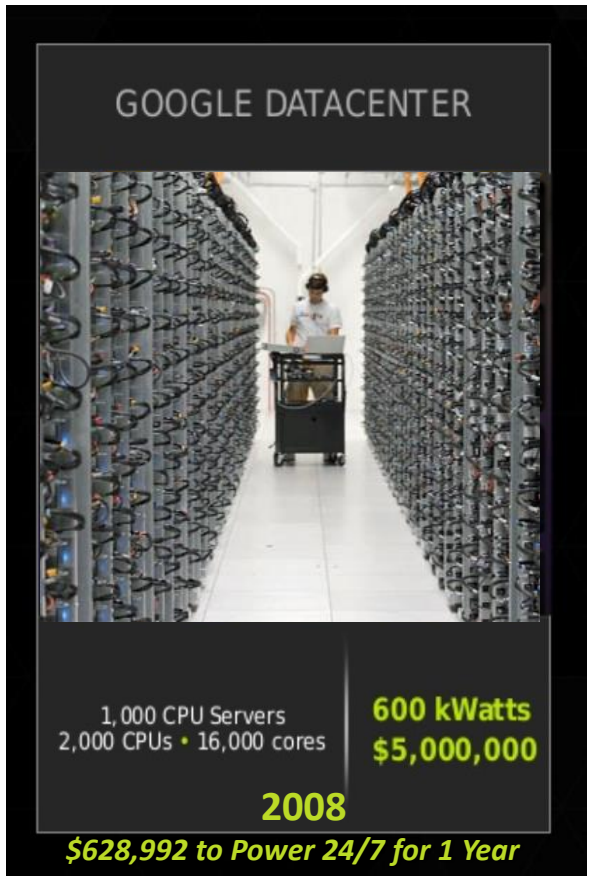
NDIA SO/LIC Symposium 2019

February 3, 2019

Shane Shaneman, NSA-IAM
Director, Strategic Government Research – DoD/IC
Carnegie Mellon University

Carnegie Mellon University

COMPUTE: Setting the Stage for the AI Revolution

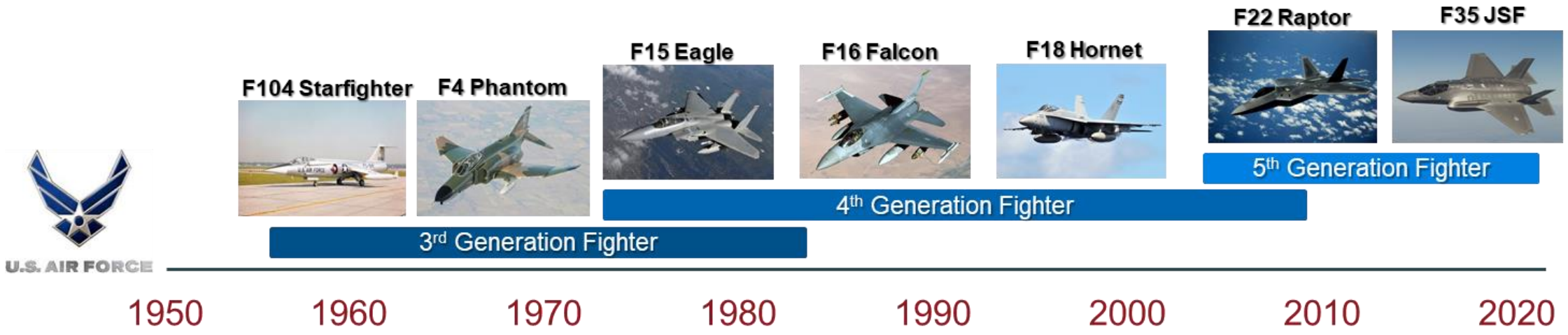


VS

Source: Wired

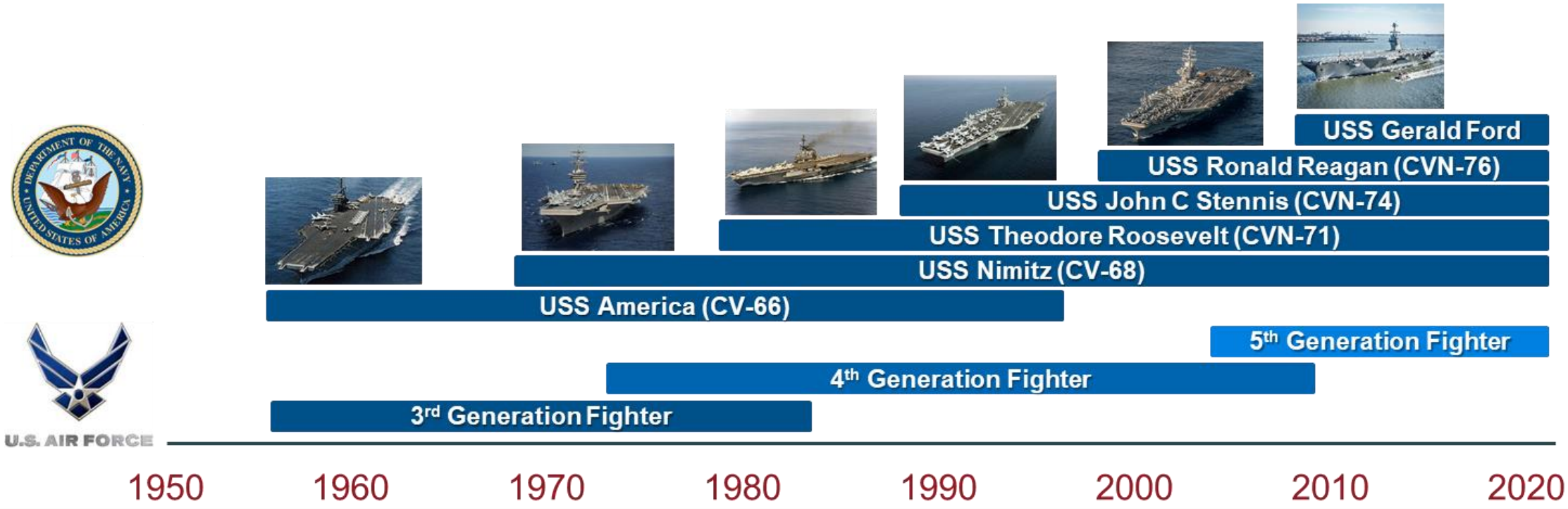
Carnegie Mellon University

Pace of Innovation in Artificial Intelligence

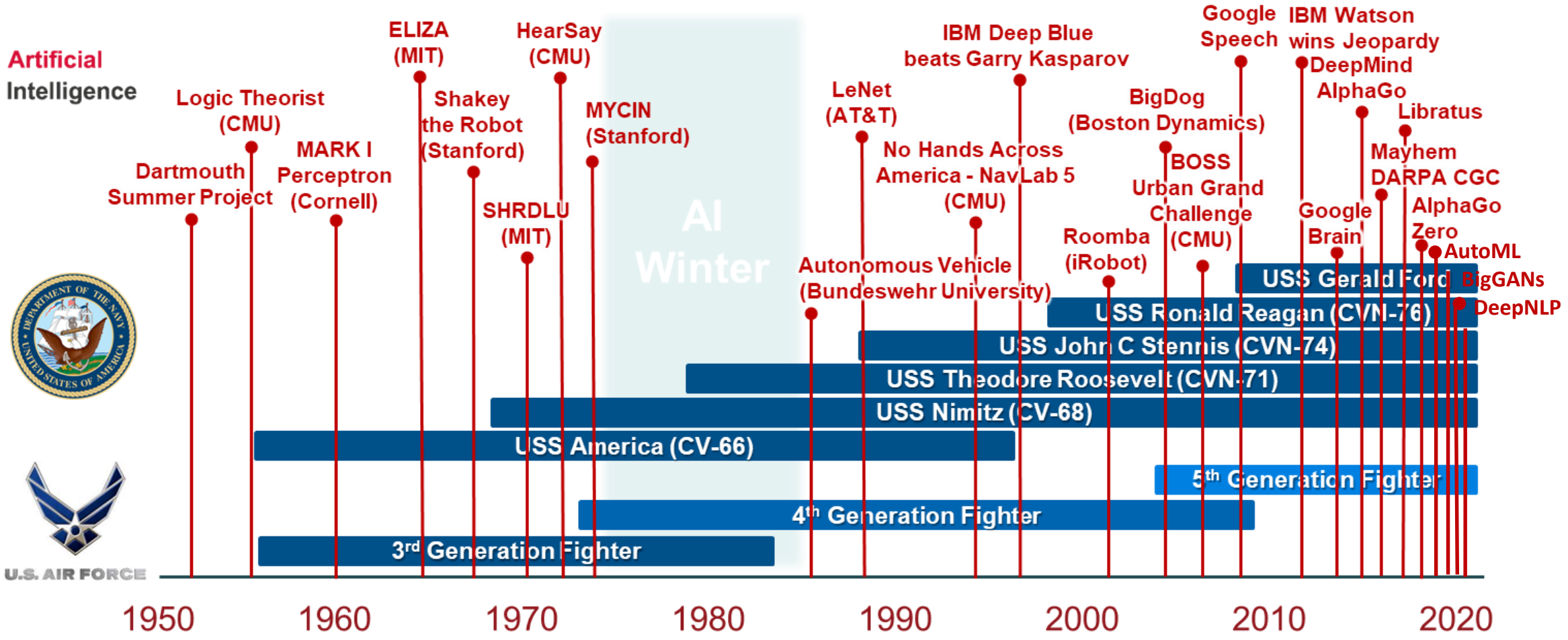


Carnegie Mellon University

Pace of Innovation in Artificial Intelligence



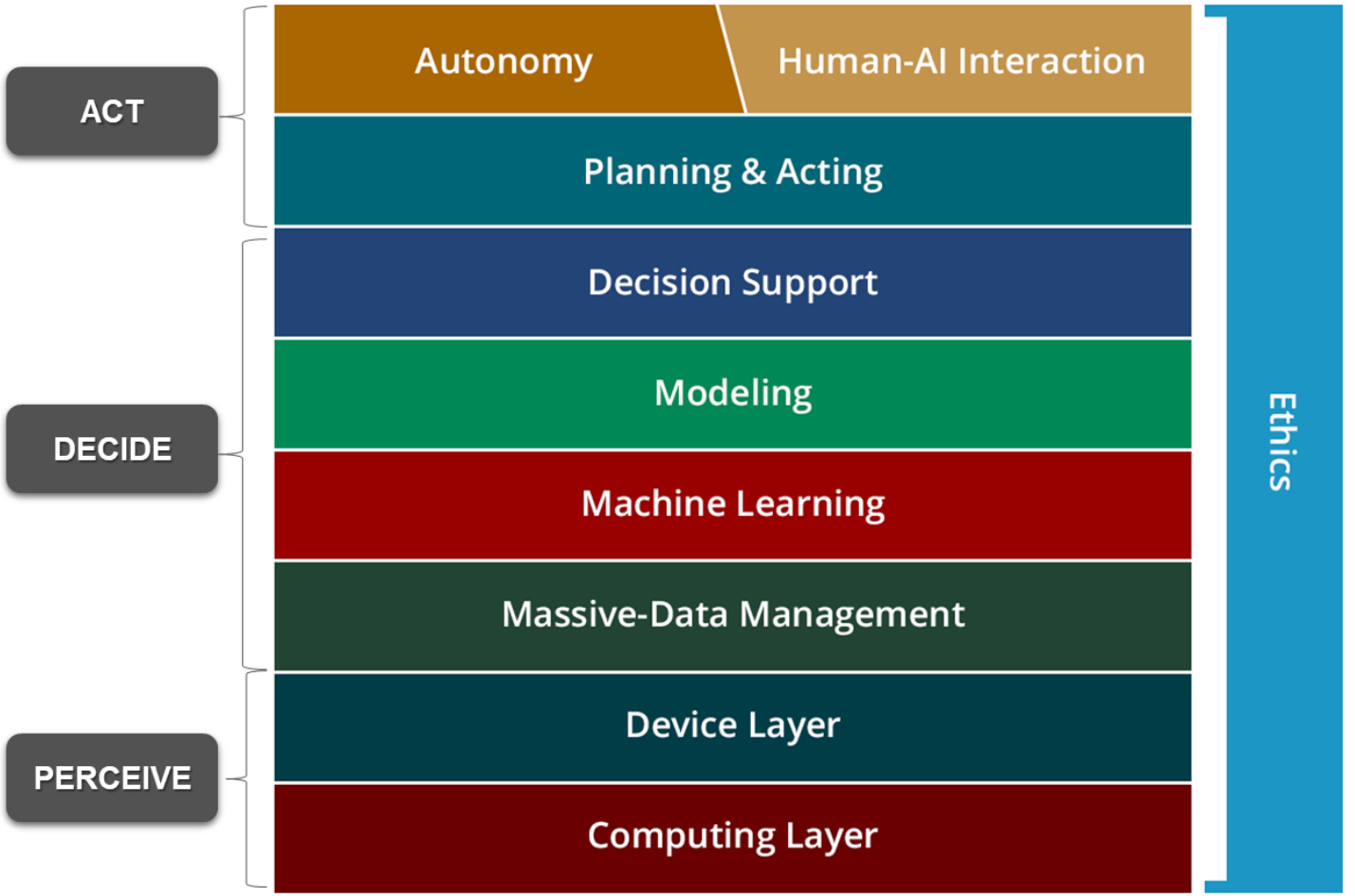
Pace of Innovation in Artificial Intelligence



Carnegie Mellon University

The AI Stack

- Each layer of the AI Stack is directly interconnected to the layers above and below it – so innovations in one layer have a direct impact on the others
- Each section of the AI Stack provides very distinctive functionality and purpose towards enabling Artificial Intelligence & Human-Machine Teaming

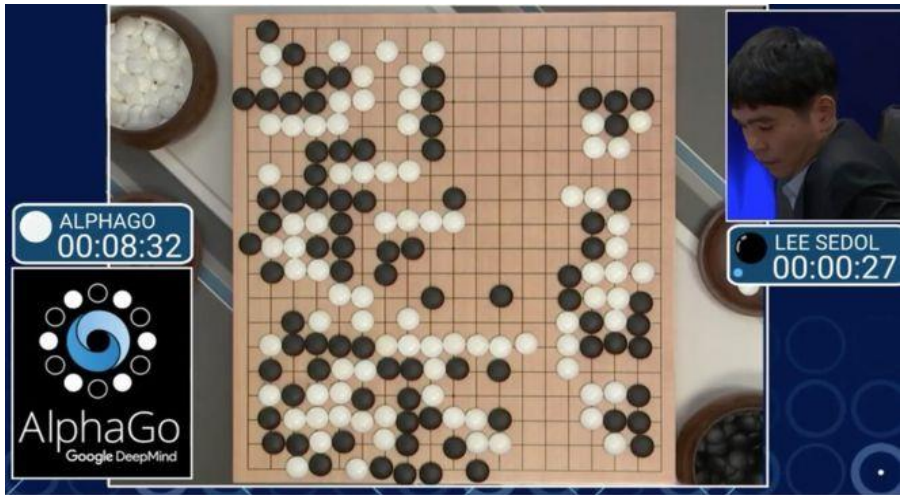


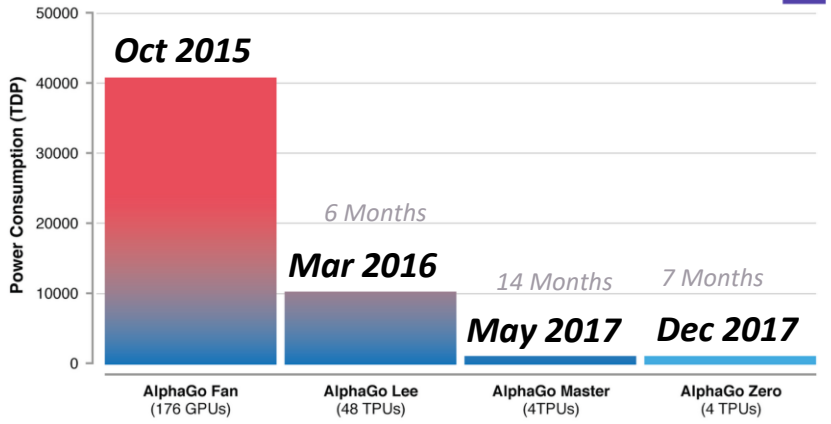
Emerging Trends & Concepts in AI

Algorithmic Agility

AlphaGo

- **October 2015: AlphaGo Fan** defeated the European champion Fan Hui.
- **March 2016: AlphaGo Lee** defeated the World's Top Go player Lee Sedol – who had won the World Championship 18 times.
- **May 2017: AlphaGo Master** participated in the Future of Go summit. It won 60 straight online games, shut out Ke Jie in a three-game match, and beat a human team with five of the world's top Go professionals
- **October 2017:** After just three days of reinforcement learning (i.e. the computer only playing games against itself), **AlphaGo Zero** emphatically defeated AlphaGo Lee by 100 games to 0.
- **December 2017:** After only 40 days of self-play training, **AlphaGo Zero** became even stronger, outperforming AlphaGo Master, which has defeated the world's best players and world number one Ke Jie.

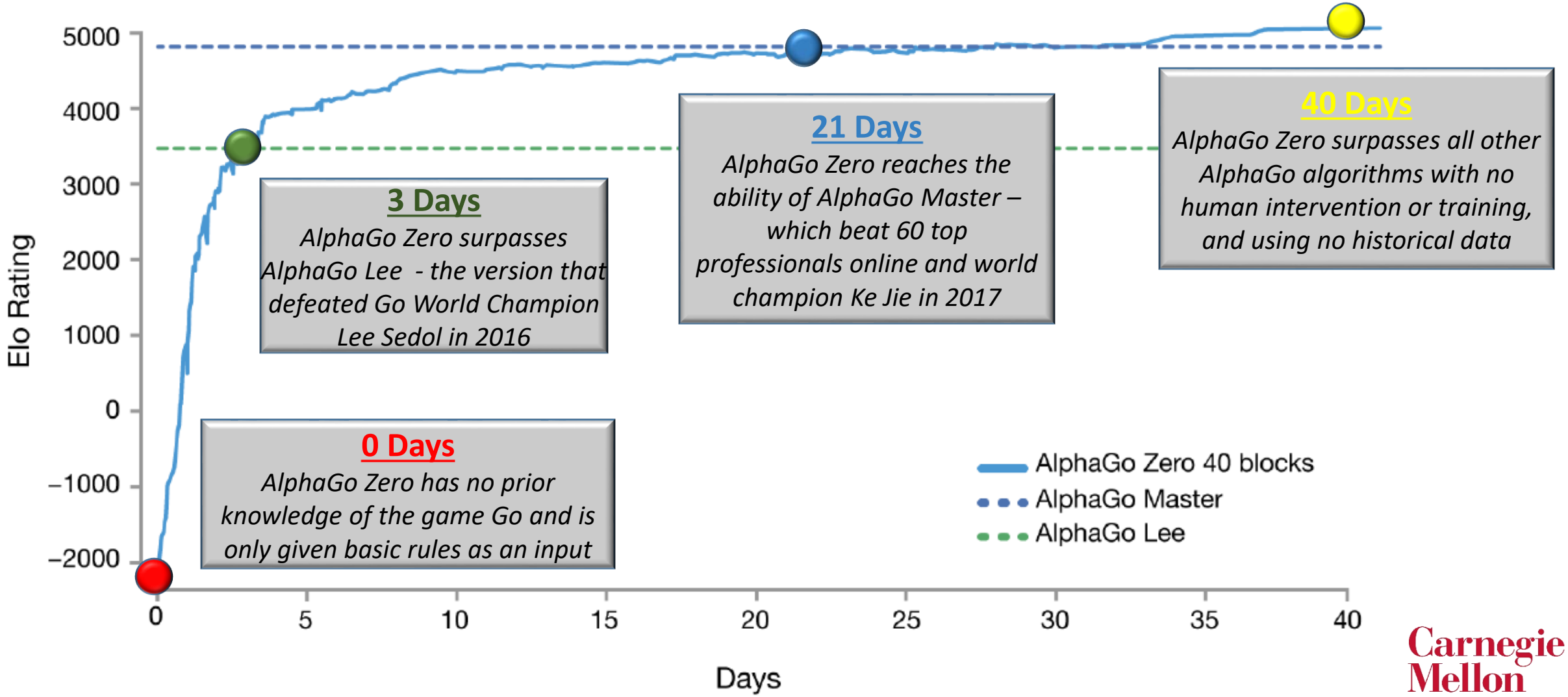




Carnegie Mellon University

Emerging Trends & Concepts in AI

Algorithmic Agility

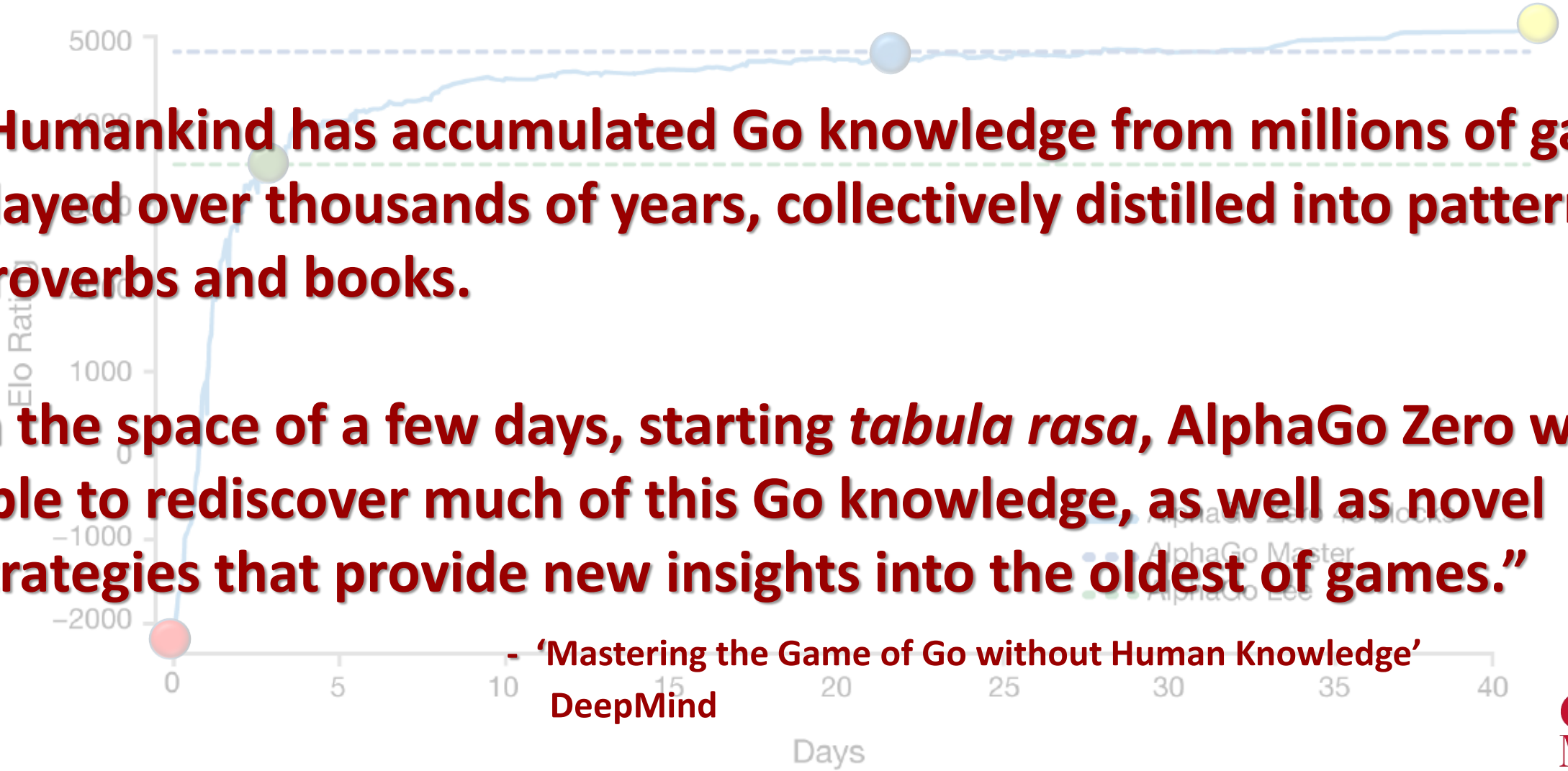


Source: deepmind,.com; TechTalks

Carnegie Mellon University

Emerging Trends & Concepts in AI

Algorithmic Agility



"Humankind has accumulated Go knowledge from millions of games played over thousands of years, collectively distilled into patterns, proverbs and books.

In the space of a few days, starting *tabula rasa*, AlphaGo Zero was able to rediscover much of this Go knowledge, as well as novel strategies that provide new insights into the oldest of games."

- 'Mastering the Game of Go without Human Knowledge' DeepMind

Source: deepmind,.com; TechTalks

Carnegie Mellon University

Thank You!

Shane Shaneman, NSA-IAM
Director, Strategic Government Research – DoD/IC
Adjunct Faculty – Robotics Institute
Carnegie Mellon University

(412) 973-1976

shane1@cmu.edu
SIPR: keith.s.shaneman.ctr@mail.smil.mil
IC: keith.shaneman_ctr@af.ic.gov

SPECIAL OPERATIONS FORCES ACQUISITION, TECHNOLOGY, & LOGISTICS

Win • Transform • People

Ms. Lisa Sanders *Director, Science & 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.
Hyper Enable the SOF Operator Now and in Future Environments.

SOF Priority Considerations

COMMANDER FOCUSED

NDS → CG VISION → CPG

DECISION CRITERIA

SOF-Peculiar?
Technical Maturity
Development Timeline/Cost
Niche vs. General Capability
Future Considerations

DECISION CRITERIA

TECH INSERTION | S&T COUNCIL | SOCOM IPL CALLS

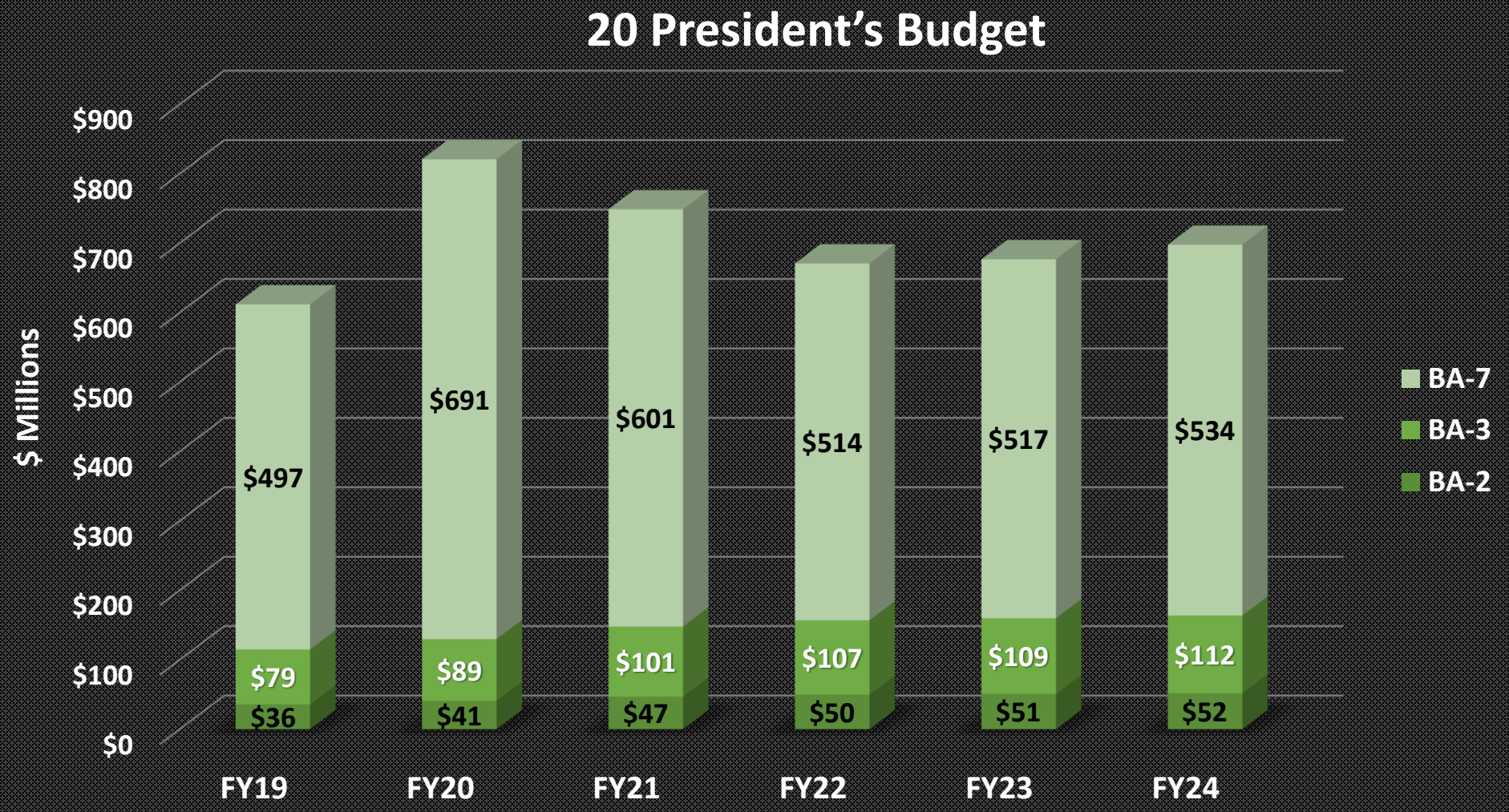
OPERATOR DRIVEN

S&T FOCUS Areas

for **MFP-11 6.2/6.3**

- Tactically Relevant Situational Awareness
- Communication and Navigation in all Environments
- Tailored Lethality
- Biotechnologies

SOF AT&L Funding (RDT&E)

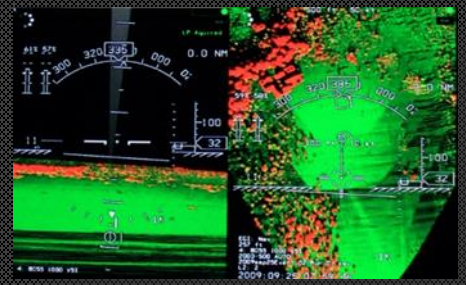


Does not include non MFP-11 in support of SOF

SOF Degraded Visual Environment

2012: Rapid Innovation Fund (RIF) / 3D-Landing Zone JCTD / Technical Experimentation (TE) Events

- Dust penetrating LIDAR Degraded Visual Environment (DVE) sensor for FLIR turret
- Multi-Function LIDAR to ensure safe rotorcraft operations in DVE (brownouts, etc.). Integrated 3D FLIR sensor.
- Ground demos of LIDAR in dust filled tent / Optical ID LIDAR demos



2013-2014: USSOCOM PEO-Rotary Wing (RW)

- DVE flight demos / DVE Program (DVEP) formally established

2017: USSOCOM PEO-RW

- DVE technical final solution selected - 10W LIDAR / Incorporated as part of the DVEP design solution

SOF Freeze Dried Plasma (FDP)

2011: USSOCOM Granted Authorization from ASD for Health Affairs to use French Freeze Dried Plasma (FDP) - Investigational New Drug

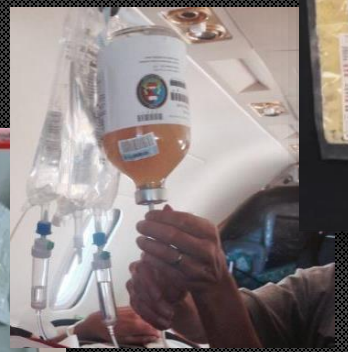
- Fielded to USASOC

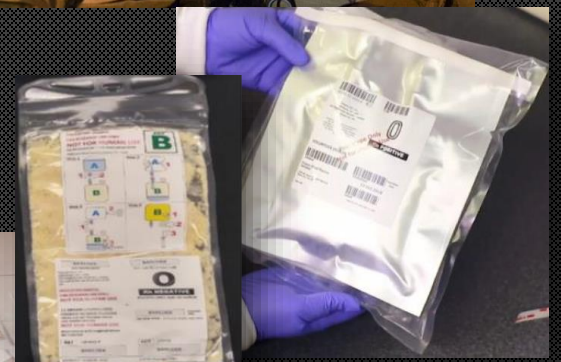
2012-2015: French FDP Fielding Expanded to all USSOCOM Components

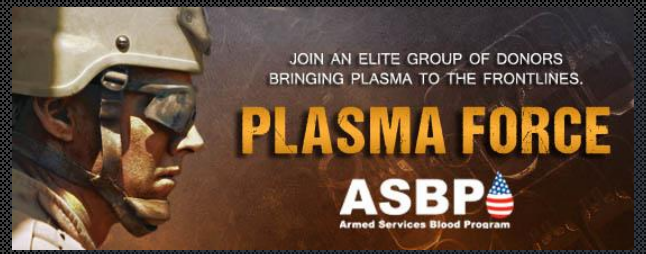
2018: Emergency Use Authorization granted for French FDP from the Food and Drug Administration

2016-Present: USSOCOM continues to pursue a U.S. manufactured FDP system

- Enabling DoD Blood Centers to manufacture FDP in rugged lightweight container
- Partnered with the Air Force Medical Service / Defense Health Agency
- Working with another Partner Nation to manufacture FDP







S&T Futures Process

Results

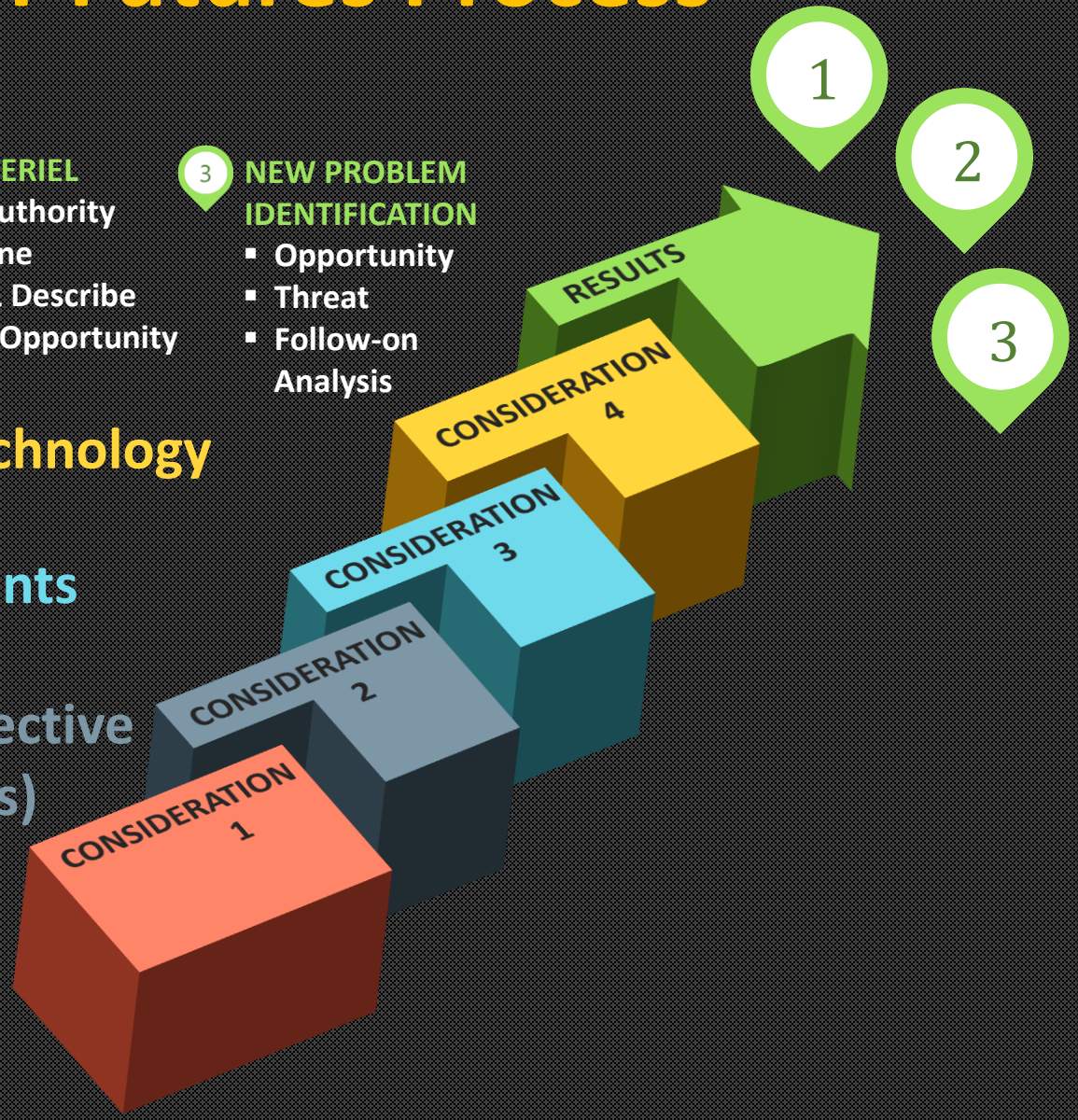
1. **MATERIEL APPROACHES**
   - Leap Ahead
   - Asymmetric
   - Divergent
2. **NON-MATERIEL**
   - Policy, Authority & Doctrine
   - Assess & Describe Impact/Opportunity
3. **NEW PROBLEM IDENTIFICATION**
   - Opportunity
   - Threat
   - Follow-on Analysis

Rapidly Changing Technology

Changing Environments

Varying Mission Objective (Measures of Success)

Changing Strategic Conditions



Multiple Engagement Paths

TILO

- Exposure
- Interest level/feedback
- Path to follow-on engagement

SOFWERX

- Capability Collaboration
- Rapid Prototyping
- Prize Challenges
- New markets for existing products
- Exposure/Feedback

S&T

- Cooperative R&D Agreements
- Experimentation opportunities
- SBIR/Broad Agency Announcements
- Commercial Solutions Opening

PEO/DIRs

- Cooperative R&D Agreements
- Upcoming Opportunities
- Contracts
- SOF to Service Transitions

USERS

- Use cases/needs
- Operator feedback
- Priorities

Tech Scouting Tool

NAVAL SURFACE WARFARE CENTER CRANE DIVISION

NDIA SOLIC 2019

The Future of the Digital Battlefield

Presented by: Ms. Patricia Herndon (SSTM)
Director, Expeditionary Warfare Department

CAPT Mark Oesterreich, USN
Commanding Officer

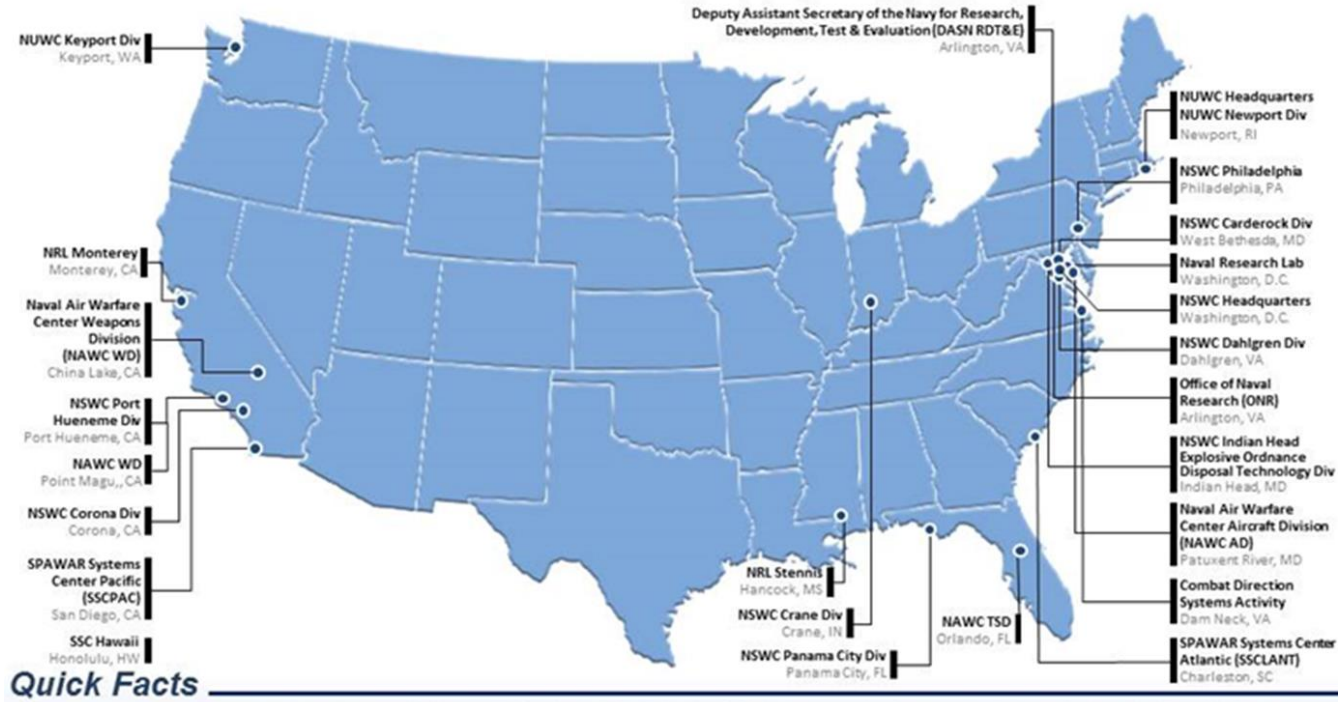
NAVSEA
WARFARE CENTERS
CRANE

Dr. Brett Seidle, SES
Technical Director

NAVSEA
WARFARE CENTERS
CRANE

What is the Government's Role?

NR&DE Naval Research & Development Establishment (NR&DE)



Quick Facts

- Diverse and highly educated workforce with 25,000 scientists, engineers, and technicians (with more than 2,000 Ph.D.s)
- 20 commands across the NAVAIR/NAVSEA Warfare Centers, SPAWAR Systems Centers, ONR and NRL
- Conducts RDT&E for the DoN to discover, develop, transition and field technologically superior naval warfighting capabilities.
- Unique Naval RDT&E facilities including laboratories, test facilities and test ranges
- Serves as principal R&D agents for Navy and Marine Corps Program Executive Offices
- Organizationally aligned to Naval Systems Commands and ONR
  - Naval Sea Systems Command (NSWCs, NUWCs)
  - Naval Air Systems Command (NAWCs)
  - Space and Naval Warfare Systems Command (SSCs)

Aggressive Research, Development, Test & Evaluation for reliable real world solutions.

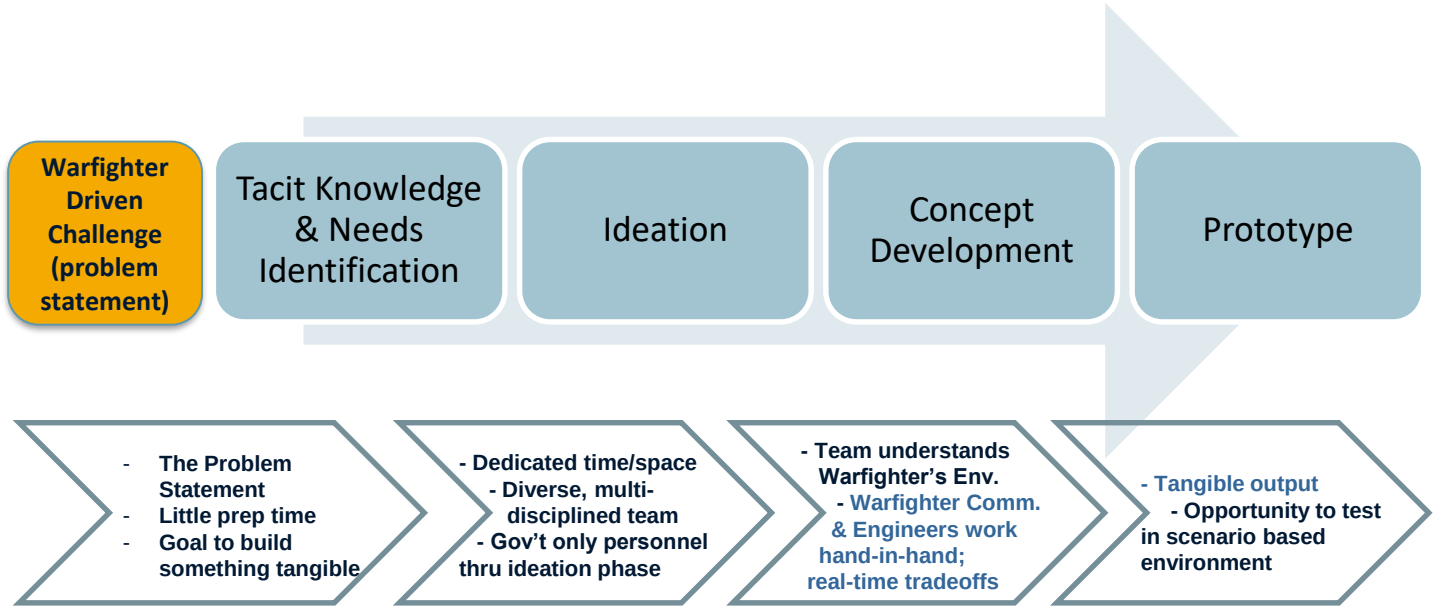
29

We provide

- *Requirements identification*
- *Develop Open Architecture Standards*
- *Define Data Structure Requirements*
- *Independent Verification and Validation (IV&V)*
- *Technology Assessments*
- *Qualification*
- *Independent Engineering Oversight*
- *Test and Evaluation*
- *Warfighter Interface*

NAVSEA
WARFARE CENTERS
CRANE

The Warfighter Driven Challenge



Leadership Commitment and Support

Culture of Organization Attitude; Passion; Team Players

Using the established NSWC Crane Government Industrial Base, rapid prototyping

GOVERNMENT SMEs WORKING WITH THE WARFIGHTER TO BETTER DEFINE THE REQUIREMENTS

LOWERING THE RISKS FOR FOLLOW-ON TECHNICAL DEVELOPMENTS

NAVSEA
WARFARE CENTERS
CRANE

Hyper-Enabled Operator

The Warfighter NEEDS intelligent systems providing ***real time dynamic battlespace information to enhance decision making, maneuver, and engagement capabilities***

NAVSEA
WARFARE CENTERS
CRANE

The Future Digital Battlefield

Working Together

We identify mission gaps and turn them into technical requirements.

So that together, we can develop enhanced interoperable technical solutions for the Hyper-Enabled Operator.

I can do things that you cannot; you can do things that I cannot, but <u>TOGETHER WE CAN DO GREAT THINGS</u>

-Mother Teresa