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Rapid Reaction Technology Office (RRTO) / Capability Prototypes (CP)

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Rapid Reaction Technology Office

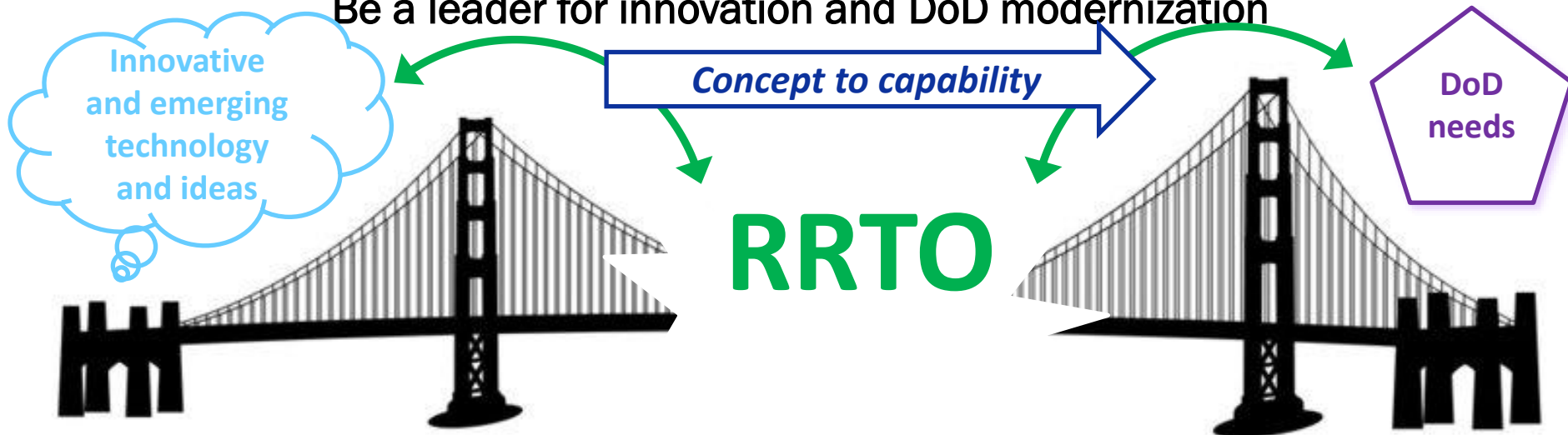


Mission

Develop accelerated pathways to deliver innovative, leap-ahead capabilities to the Joint Force through prototypes and experiments

Vision

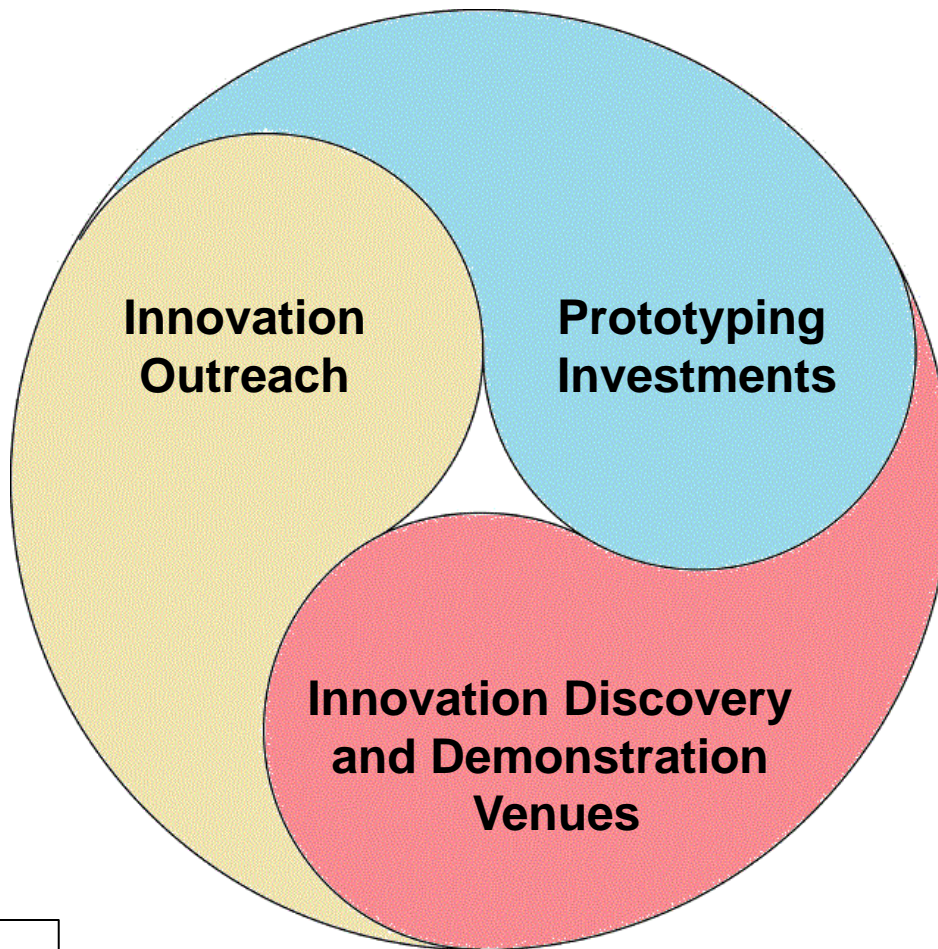
Be a leader for innovation and DoD modernization



Established in 2003, RRTO's strength is the ability to discover innovative and emerging ideas, turn them into executable projects, and quickly transition them to the Services and warfighter



RRTO Innovation Activities



Three prototyping programs focused on developing and transitioning capabilities:

- Innovation “Push” (QRSP)
- Emerging Tech (ECTD)
- Valley of Death (RPP)(6.4)

FY21:

- 73 projects; 21 new starts
- 88% transition rate to Service or warfighter
- \$240M/year investments

Three agile “sandbox” & demonstration venues that discover new tech and enable innovators through better understanding of DoD needs

FY21:

- 12 multi-day events
- 219 techs demonstrated
- 63 transitions/transfers
- 136 small/non-trationals
- \$5M/year program cost

Matchmaking service that teaches others to fish.
 Discovers new and innovative technologies and connects performers with Services and others with technology needs

FY21:

- 1,070 companies
- 95 tech presentations
- 24 follow-on negotiations
- \$1M/year program cost

QRSP: Quick Reaction Special Projects
 ECTD: Emerging Capabilities Tech Development
 RPP: Rapid Prototyping Program



Defining Innovation



Innovation is the result of critical and creative thinking and the conversion of new ideas into valued outcomes.

The U.S. Army Operating Concept, 2020-2040

Innovation is the process of creating value by applying novel solutions to meaningful problems.

Digital Intent
<https://digintent.com/what-is-innovation>

How we implement Innovation

Partners

- Small business and non-trationals
- Academia, FFRDCs, UARCs
- Individual PIs at Service/Nat'l Labs
- Large businesses
- Joint Staff, Services, CCMDs, OSD
- Other innovation/prototyping COIs

Process

- Streamlined proposal rqm'ts
- Quick decisions
- Optimized contracting
- Deconflict proposals (tech & ops) across DoD ecosystem
- Structure enables total pivots
- Year of execution awards

Product

- Range of programs means range of prototypes
- Optimize innovation curve vs transition curve (T~80%)
- Transition to Service program
- Transition to warfighter
- Proof-of-Principle



RRTO Operating Model Encourages Innovation

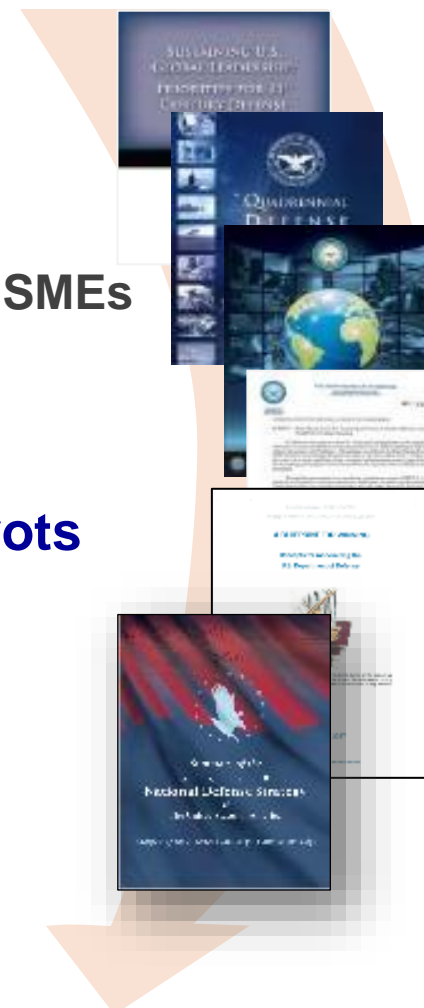


- **Accept concepts from all sources**
- **Streamlined process for funding consideration**
 - Low barrier to entry; three-page white paper
 - Ideas reviewed by network of technical and operational SMEs
- **Awards spread throughout the year of execution**
- **Execute through partnership with transition offices**
- **Minimal project tails enables immediate and total pivots**

Guiding principles

1. Emphasize on **innovative**, leap-ahead capabilities
2. **Co-funding** from other stakeholders
3. Clear **transition** path to programs or people
4. **Jointness**
5. Closely aligned with the Department's **strategic guidance**

A deep-rooted culture of agility and innovation





RRTO Prototyping Programs

	QRSP	ECTD	RPP	RPF
FY21 Execution Value	\$42M Advanced Tech. Development (6.3)	\$90M Advanced Technology Development (6.3)	\$92M Demonstration and Validation (6.4)	\$0M Non-appropriated 6.3 and 6.4 funds
Focus	Accelerates innovative ideas, especially from non-traditional performers	Rapidly explores and onramps emerging technologies	Moves technologies across “Valley of Death” and into Service programs	Advances Modernization in priority areas
Key Features	Operational prototypes that focus on non-traditional performers and other sources of innovation Provides quick wins for joint warfighter Risk tolerant: small investments allow pursuit of needle-movers Projects average 12 months and <\$1M Transitioned 39 of 45 completed projects in FY20 (87%)	Proof-of-principle prototypes in emerging technologies that explore the art of the possible Delivers mission-focused capabilities during the year of execution Projects historically average 1-3 years and <\$6 million Transitioned 2 of 2 completed projects in FY20 (100%)	Operational prototypes that deliver Joint Modernization capabilities through Service programs of record Projects historically average <\$15M across 1 year FY20 selections averaged \$150M across 5-6 years Transitioned 3 of 5 completed projects in FY20 (60%)	Operational prototypes that accelerate DoD modernization priorities Streamlined and risk-tolerant approach to invest in high pay-off projects that provide a residual capability within 5 years Average project 3 years with a single year of funding <\$20M \$264M in active projects; transitions begin in FY22
Key Stakeholders and Transition Partners	- Services / Agencies - Joint Staff / CCMDs - Joint warfighter	- Services / Agencies - Joint Staff / CCMDs - Joint warfighter	- Services / Agencies - Joint Staff / CCMDs	- Services / Agencies - Joint Staff / CCMDs

QRSP: Quick Reaction Special Projects
 ECTD: Emerging Capabilities Tech Development
 RPP: Rapid Prototyping Program
 RPF: Rapid Prototyping Fund



Example Prototyping Efforts



■ Vehicle Centric Cyber-Secure Fast Forming Intelligent Microgrid

- Leap ahead high-efficiency power generators on military tactical vehicles
- Resilient power for mission critical loads in mobile/expeditionary environment
- Transitioned to PM-THAAD in FY20



■ Talon Hayabusa/Kitsune

- Free space optics capability for communications in RF contested environment
- Accesses parts of the electromagnetic spectrum by using eye safe laser energy to provide high bandwidth communications
- Transitions to USN for shipboard use and USMC for multi-domain use in FY21



■ Enhanced Blast Munitions

- Combines advanced energetic materials with innovative explosive charge configuration
- Delivers significantly improved lethality without sacrificing other characteristics
- Transitions to JPEO A&A in FY21 for continued development



■ Hack-A-Sat

- DEFCON 2020 challenge to identify cutting-edge hacking strategies and develop new offensive and defensive approaches to space and cyber protection
- Leverages talents of the non-traditional global security research community
- CONOPs for space systems and cyberspace operations transition to USSF in FY21





Innovation Outreach



- RRTO engages with emerging and nontraditional technology companies to quickly bring capabilities into DoD
- 3-4 topics per year posted as SAM.GOV “Solutions Meeting”
- Ultra-lightweight process fosters high levels of industry participation

2021 Numbers

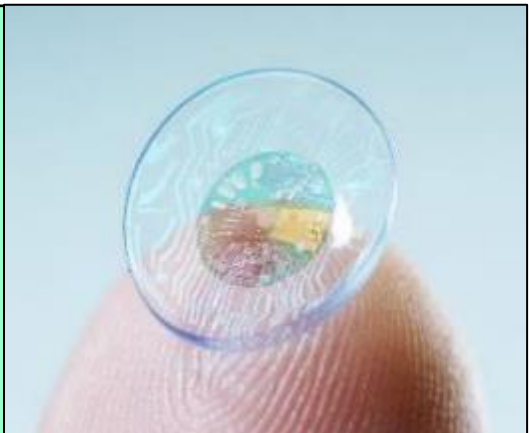
- 1,070 Companies applied to participate
- 95 Companies presented to the requesting government audience
- 24+ companies in follow-on discussions/ negotiations

2022 Activities

- Resilient Technologies for Distributed Decision-making
- Army C5ISR Solutions Meeting
- Global Solutions Meeting
- Golden Bear 3

Augmented Reality (AR) Contact Lens (CL)

- Miniaturizes display electronics, power systems, communications, and processing by orders of magnitude
- Leverages commercial market forces but enables a DoD-specific variant
- Transition: Naval Special Warfare in FY 2022





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 2021, Stiletto demonstrated 74 technologies and transitioned or introduced 43 to DoD, including systems from 30 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 2021, Thunderstorm demonstrated 60 technologies and transitioned or introduced 8 to DoD, including systems from 41 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. In FY 2021, JIFX demonstrated 85 technologies and transitioned or introduced 12 to DoD, including systems from 65 small businesses.



Simulation Experiments (SIMEX)

Simulation Experiments (SIMEX) provide a high-fidelity environment to develop operational concepts for emerging technologies. Sensors, weapon systems, kill chains, and command & control with operational users are accurately modeled and simulated by MITRE’s National Security Experimentation Lab, providing data-driven results. 58 SIMEX events have been conducted since 2001, including directed energy weapons, cyber warfare, autonomous systems, and UAS/counter-UAS.

FY21: 63	Technologies Transitioned	136	Small Businesses Mentored	219	Technologies Demonstrated	715	DoD/Government Attendees
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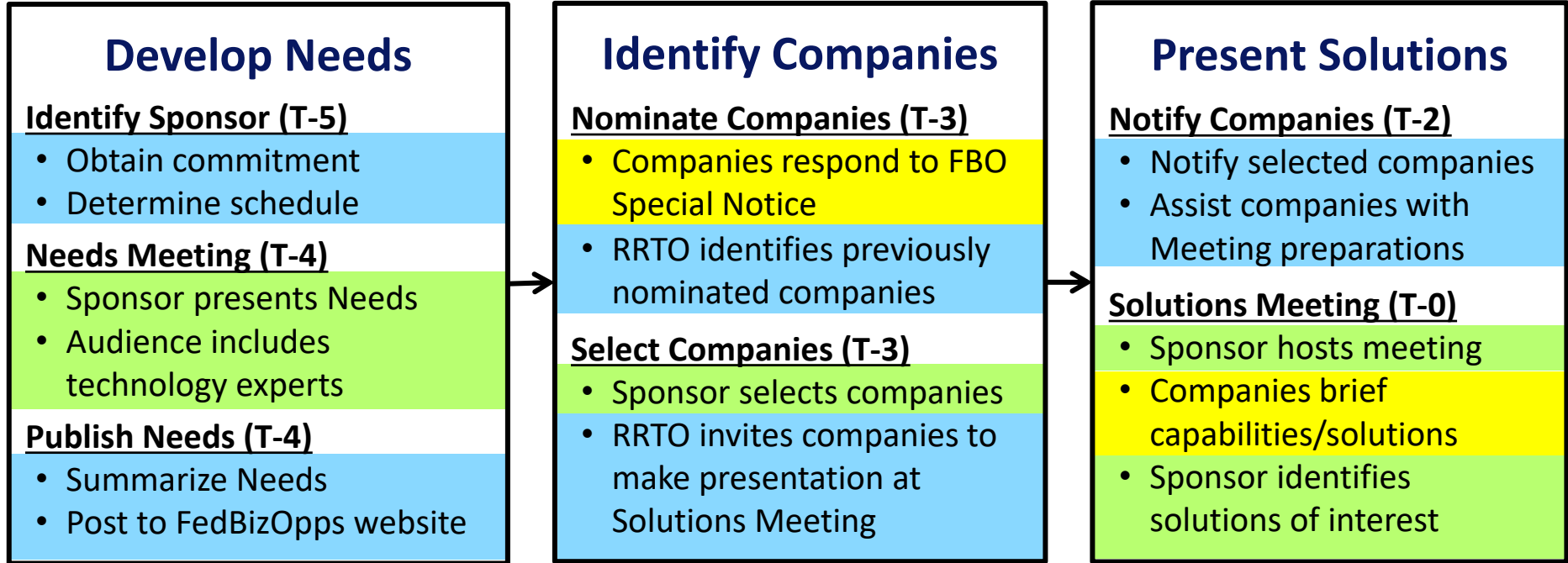
Demonstration & Experimentation Venues
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Back-up



Innovation Outreach Process



Develop Needs

Identify Sponsor (T-5)

- Obtain commitment
- Determine schedule

Needs Meeting (T-4)

- Sponsor presents Needs
- Audience includes technology experts

Publish Needs (T-4)

- Summarize Needs
- Post to FedBizOpps website

Identify Companies

Nominate Companies (T-3)

- Companies respond to FBO Special Notice
- RRTO identifies previously nominated companies

Select Companies (T-3)

- Sponsor selects companies
- RRTO invites companies to make presentation at Solutions Meeting

Present Solutions

Notify Companies (T-2)

- Notify selected companies
- Assist companies with Meeting preparations

Solutions Meeting (T-0)

- Sponsor hosts meeting
- Companies brief capabilities/solutions
- Sponsor identifies solutions of interest

Technology Solutions Experimentation

Experimentation:

- Sponsor identifies funds for products experimentation or demonstration
- Sponsor conducts experiments

Follow-on Acquisition:

- Sponsor may procure successfully demonstrated products

Primary Responsibility

Company

Sponsor

RRTO Innovation Team