



Prototyping: Accelerating the Adoption of Transformative Capabilities

April 12, 2016

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Emerging Capability & Prototyping**



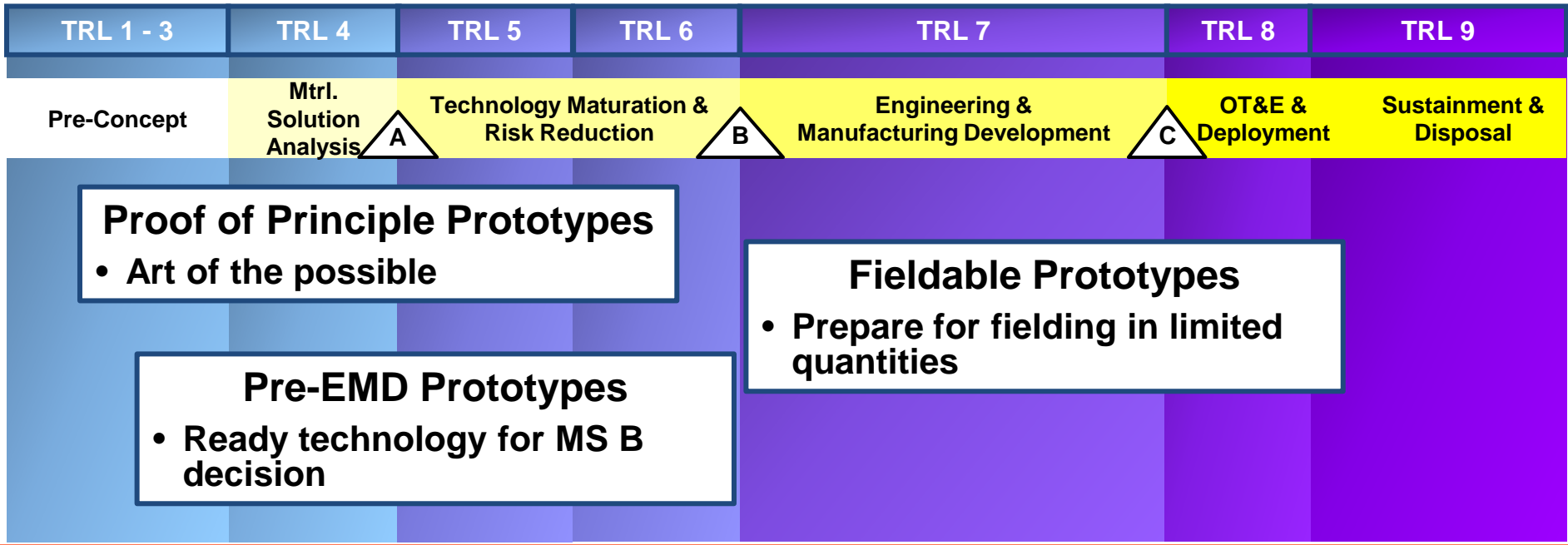
DoD Prototyping

What do we mean by Prototyping?

“A set of design and development activities intended to reduce technical uncertainty and to generate information to improve the quality of subsequent decisionmaking.”

– On Prototyping, *RAND Corporation*, 2009

Prototyping Categories





Why Greater Emphasis on Prototyping?



- **Better Buying Power**
- **Defense Innovation Initiative**
- **3rd Offset Strategy**
- **NDAA FY16 Section 804**
- **NDAA FY 16 Draft Language**



Why Greater Emphasis on Prototyping?



- **Constrained Budgets - we cannot afford to procure unique or exquisite systems for every potential threat:**

Russia, China

North Korea, Iran

Trans-national
Terrorists

- **Department's commitment to Modular Open Systems Architecture (MOSA) and standard interfaces encourage traditional and non-traditional sources of supply to offer subsystem options**
- **Advanced design and manufacturing tools enable faster and more affordable prototype development**

Prototyping advances technology frontiers...



Roles of Prototyping

Technology

- Clear a specific technical hurdle
- Explore art of the possible
- Inform requirements process
- Aid technology integration

Production

- Offer rapid response to emerging capability shortfalls
- Improve development methods and manufacturing

Affordability

- Inform and validate cost estimates
- Leverage the investment of non-traditional and international performers

Supporting Policies

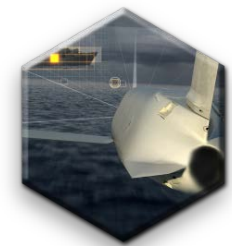
- Demonstrate open standards
- Promote competition throughout the product lifecycle
- Stimulate industrial base to advance the state of the practice



DoD Prototyping Priorities



- **Autonomy & Robotics**
- **Data Analytics**
- **Biomedical**
- **Electronic Warfare / Cyber**
- **Future of Computing/Micro-electronics**
- **Hypersonics**
- **Directed Energy**
- **Manufacturing**
 - Innovation Centers
 - Engineered Resilient Systems
- **Bending the Cost Curve - Affordability**





EC&P Lines of Operation



- **Counter Emerging Threats**
- **Enhance Interoperability & Extend the life of Existing Systems**
- **Accelerate Adoption of Transformative Capability**



Emerging Capabilities Technology Development (ECTD)



Technology

Explore art of the possible

Infrared Motion Detection (IrMD) Using Existing EO/IR Assets



RWS Auto Prioritization, Targeting, and Operator Cueing (RAPTOR)

Spectral Management



Emerging Capabilities Technology Development (ECTD)

- Pursue risk-reducing technology prototypes and demonstrations of cutting edge land, sea, air and space systems for joint and Service users
- Proof-of-Principle prototypes; < 36 months, < \$6M
- POC: Mr. Glenn Fogg – glenn.a.fogg.civ@mail.mil



Foreign Comparative Test (FCT)



Technology

Aid technology integration

Pilot Physiological Monitoring and Warning System

Pilot Oxisensor



Affordability

Leverage international performers' investments



Soldier Power with Inductive Recharge and Intelligent Textiles

Soldier-Sniper Weapon Observation Reconnaissance Device



Foreign Comparative Test (FCT)

- Evaluate foreign prototype technology to adapt / transition for DoD use
- Pre-EMD prototype and non-development item demonstrations; < 24 months, < \$2.5M
- POC: Col Scott Wallace– scott.t.wallace.mil@mail.mil



Joint Capability Technology Demonstration (JCTD)



Technology

Clear a specific technical hurdle

Affordability

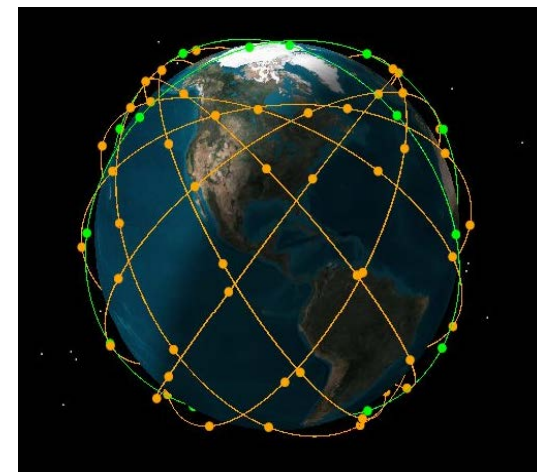
Inform and validate cost estimates

Autonomous Mobility
Applique System
(AMAS)



High Speed Container
Delivery System
(HSCDS)

Kestrel Eye



Joint Capability Technology Demonstration (JCTD)

- Foster innovation, contribute to accelerated acquisition and weapon system affordability while providing the Joint Forces with a decisive technical advantage
- Pre-EMD and Fieldable Prototypes/Demonstrations; < 48 months, < \$100M
- POC: Mr. Elmer Roman– elmer.l.roman.civ@mail.mil



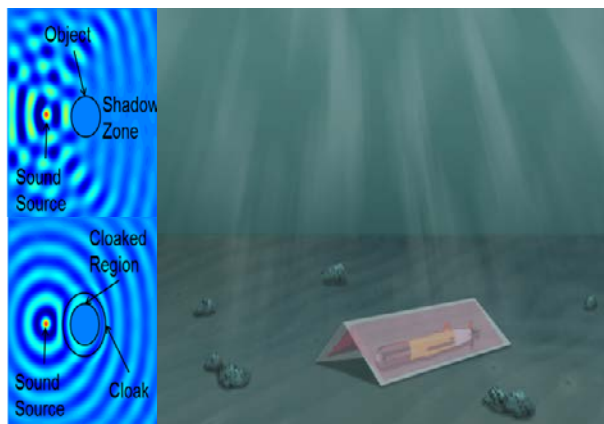
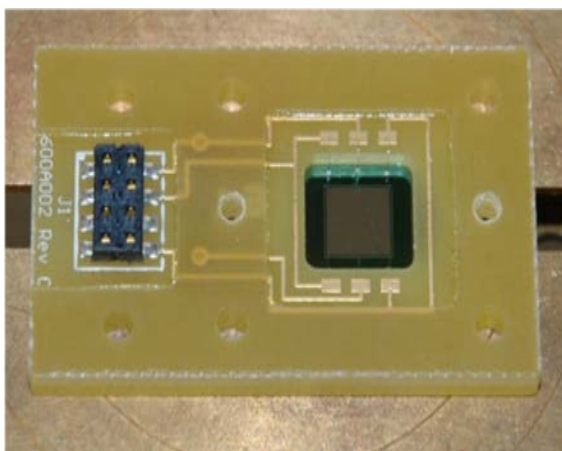
Quick Reaction Special Projects (QRSP)



Production

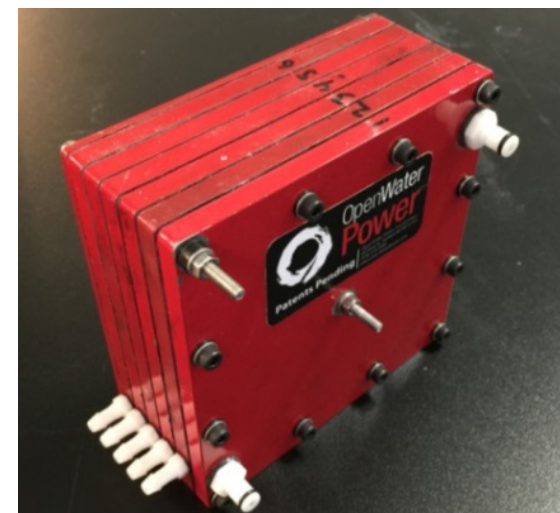
Offer rapid response to emerging capability shortfalls

Solid State Neutron Detector (SSND)



Acoustic Cloaking for Minimizing Target Detection

Aluminum-Seawater Fuel Cell



Quick Reaction Special Projects (QRSP)

- Mature emerging technologies for operational use.
- QRF – Conventional warfare needs focusing on A2/AD (ex: IWAS); < 12 months, < \$3M
- RRF – Irregular warfare needs with global focus (ex: ANDE); < 18 months, < \$1.5M
- POC: Mr. Glenn Fogg – glenn.a.fogg.civ@mail.mil



Rapid Innovation Fund (RIF)



Technology

Aid technology integration

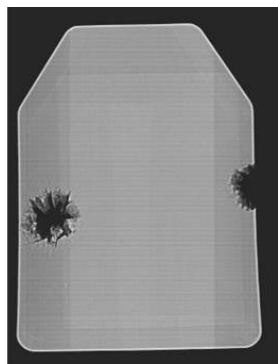
Technology

Explore art of the possible

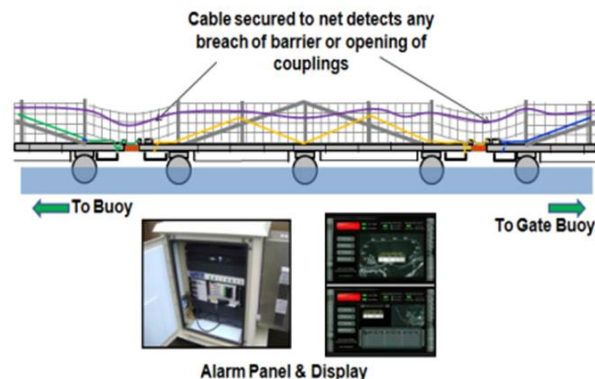
Encapsulated Body Armor



w/o Encapsulation



with Encapsulation



Port Security Barriers Intrusion Detection System (PIDS)

Miniature Deployable System for Rapid TBI Screening



Rapid Innovation Fund (RIF)

- Accelerate the fielding of innovative technologies into military systems pursuant to Small Business Innovative Research projects, technologies developed by the DoD labs, and other innovative technologies
- Award preference to small businesses: < 24 months, < \$3M
- POC: Mr. Thomas (Dan) Cundiff– thomas.d.cundiff.civ@mail.mil



Focus Areas FY 2017



- **Asymmetric Force Application**
- **Electromagnetic Spectrum Agility**
- **Autonomous Systems**
- **Information Operation and Analytics**



Summary

DoD Priorities

- Autonomy & Robotics
- Data Analytics
- Biomedical
- Electronic Warfare / Cyber
- Future of Computing
- Micro-electronics
- Hypersonics
- Directed Energy
- Manufacturing
 - Innovation Centers
 - Engineered Resilient Systems
- Bending the Cost Curve - Affordability

Definition

“A set of design and development activities intended to reduce technical uncertainty and to generate information to improve the quality of subsequent decisionmaking.”

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Roles of Prototyping



“It’s tough to make predictions, especially about the future.”
Yogi Berra



BACKUP



EC&P Budget Execution



PB 2017 CYCLE	Approp	PB17	PB17	PB17	PB17	PB17
	FY-16	FY-17	FY-18	FY-19	FY-20	FY-21
Joint Capability Technology Demonstrations (JCTD)	\$ 132,540	\$ 148,184	\$ 115,975	\$ 117,047	\$ 119,153	\$ 124,494
Foreign Comparative Testing (FCT)	\$ 24,782	\$ 19,343	\$ 24,387	\$ 25,066	\$ 25,789	\$ 26,315
Emerging Capabilities Technology Development (ECTD)	\$ 41,015	\$ 49,895	\$ 29,903	\$ 38,118	\$ 38,658	\$ 39,437
Quick Reaction Special Projects (QRSP)	\$ 70,500	\$ 74,943	\$ 69,442	\$ 73,132	\$ 80,891	\$ 85,057
Total: EC&P Direct Control:	\$ 268,837	\$ 292,365	\$ 239,707	\$ 253,363	\$ 264,491	\$ 275,303