

# ***Awareness and Forecasting for C-WMD Technologies***

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# DTRA Mission

***“To safeguard the US and its Allies from Weapons of Mass Destruction (Chemical, Biological, Radiological, and Nuclear) and High-Yield Explosives by providing capabilities to reduce, eliminate and counter the threat, and mitigate its consequences”***



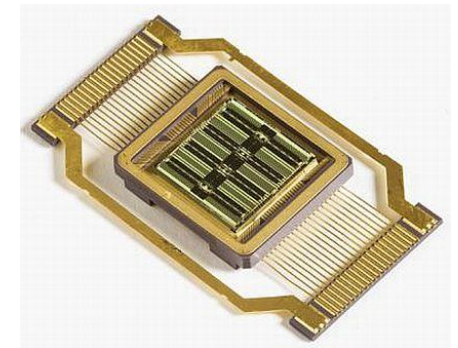


# What's Unique about DTRA Research, Development, Test and Evaluation (RDT&E)

- **Focused Solely on CBRNE**
  - *Collaboratively executes the two primary DoD S&T budgets for CWMD*
- **Within a Combat Support Agency (CSA)**
  - Military / Deployable Workforce
  - 24/7 Ops / Reachback Center
  - Liaison offices at all US Commands
- **Nimble and responsive to urgent needs**
  - *Basic Research through Advanced Technology Development (6.1 - 6.3) "under one roof"*
- **Top-notch and unique in-house field test capability**
- **Competitive "Best of Breed" across National/DoD labs, industry, academia**
- **Aligned, co-located with USSTRATCOM Center for CWMD**
  - Requirements
  - Advocacy
  - Synchronization across DOD/Interagency



CWMD Weapons Development and Testing



Radiation Hardened 64MB SRAM Chip





# Shaping and Driving CWMD S&T Investment Strategy

## CWMD Driving Factors

- Urgency/immediacy of the threat
- Low probability/High consequence
  - Must anticipate/model/game/use analogs
- Need for on-call, comprehensive expertise for DoD & USG
  - Demand for a comprehensive portfolio
  - Support research that builds expertise



## Trends

- Counter threats as far “upstream” as possible
- Need for global partnerships/interagency efforts
- Transform nonproliferation timelines to counterterrorism timelines
- Leveraging commercial innovation



## Research and Development

## Meeting the most pressing challenges across the CWMD spectrum

## ***Enhance Strategic Deterrence***

- **Treaty Verification**
- **System Survivability**
- **Forensics**
- **Targeting**



## Counter WMD Terrorism and Proliferation

- ***Threat Assessment***
- ***WMD ISR***
- ***Conventional Defeat***
- ***Special Operations Support***



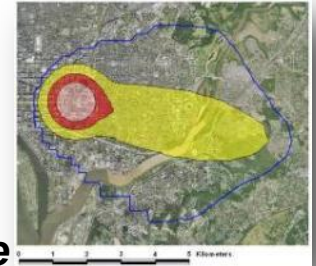
## Enablers

- ***Basic Research***
- ***CWMD Testing Capabilities***
- ***Advanced Analytics***
- ***Interagency, international leverage***




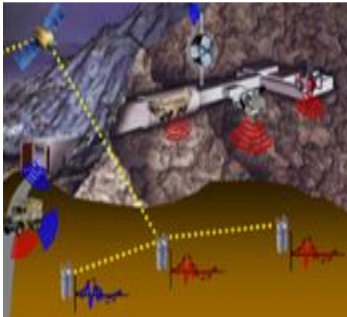
## Protect the Force

- ***Environmental CBRN Sensing***
- ***Personnel/Protection/Hardening***
- ***Collective Protection***
- ***Medical Diagnostics & Countermeasures***
- ***Post-attack Resiliency/Recovery***



## Anticipate and Prepare

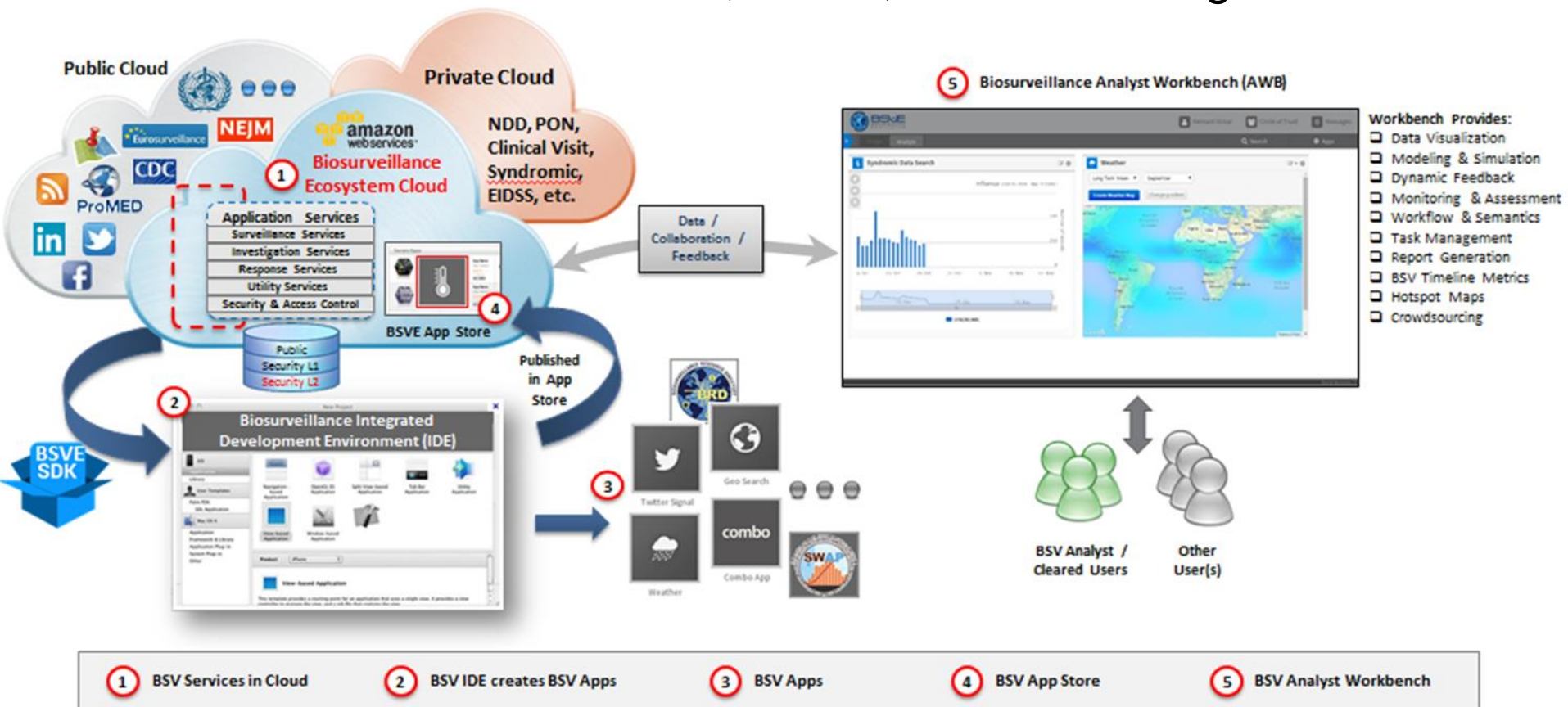
- **Hazard Characterization and Prediction**
  - **Identifying Emerging Threats**
  - **Global Situational Awareness**
- 





# BSVE Conceptual Architecture

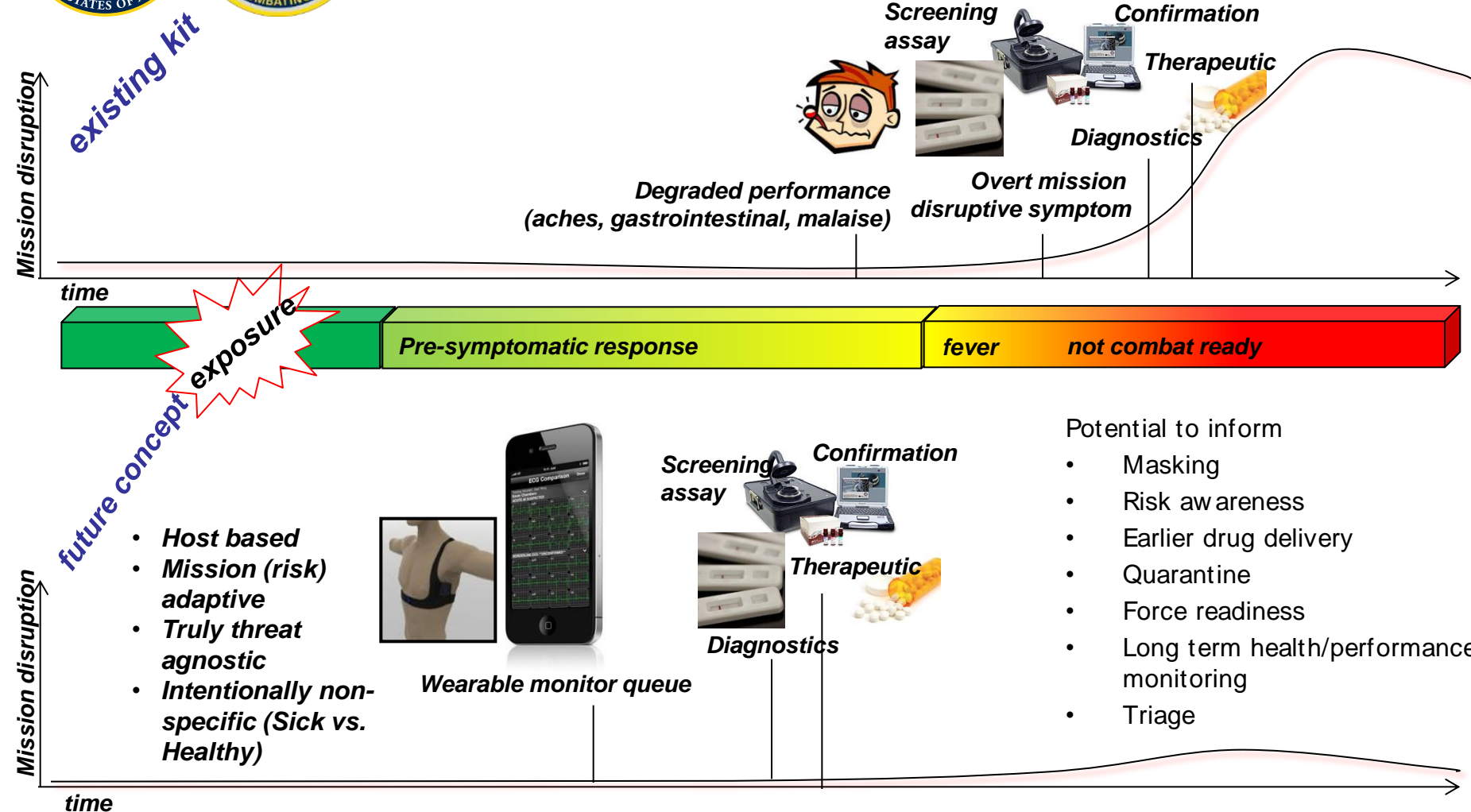
The BSVE is designed to bring together data, tools and the Users in a cloud-based, social, self-sustaining web







# Wearable CB Exposure Monitor





# DTRA-CB Partnership with the Intelligence Community

*DTRA-CB closely partners with the Intelligence Community to ensure the right threat agents and technologies are being addressed and to build a layered approach for anticipating surprise.*

- Identifies threat agents of concern
- Provides input on threat agent priorities

Intelligence Community (IC)

*Ensures the right threats are being addressed*



- Provides characterization of threat agents
- Identifies potential technologies of concern

DTRA-CB

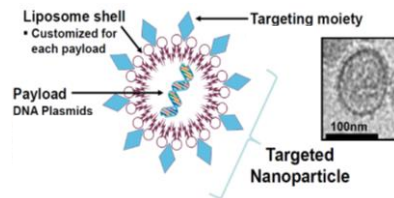
*Builds a layered approach for anticipating surprise*

## Example of Collaboration on Emerging Technologies

### DTRA-CB Synthetic Biology S&T Efforts

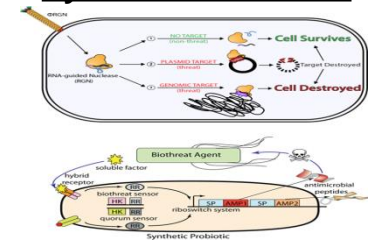
*Gene editing, synthetic biology advancements potential to enable both threats and countermeasures.*

#### Targeted Nanodelivery Platform



Utilize synthetic biology approaches (e.g., Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR), etc.) to design and construct synthetic gene networks for a variety of biotechnology and medical applications.

#### Synthetic Probiotics



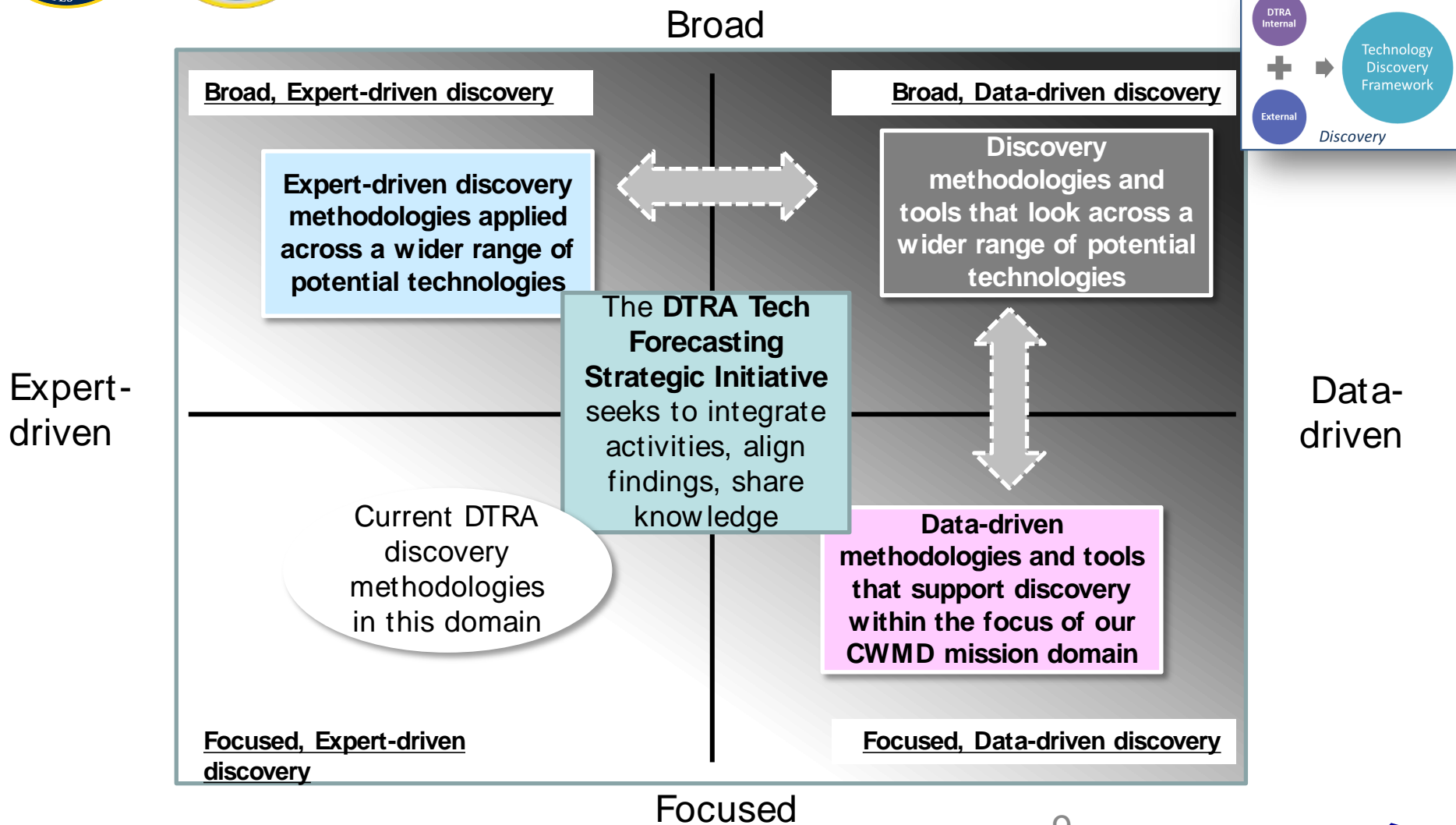
*Partner with IC to assess threats posed by new technological advances.*





# Discovery Methodologies Assessment

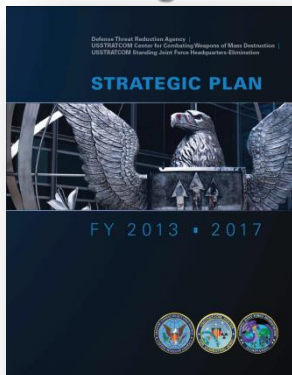
## Way Forward





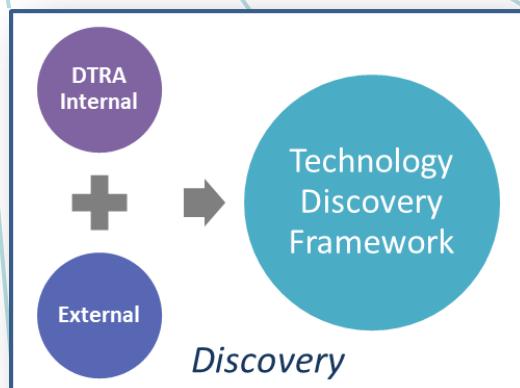
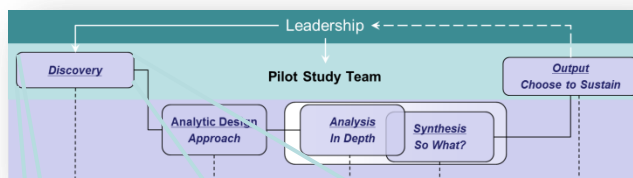
# DTRA Tech Forecasting – Future

## DTRA/SCC-WMD/SJFHQ-E Strategic Plan



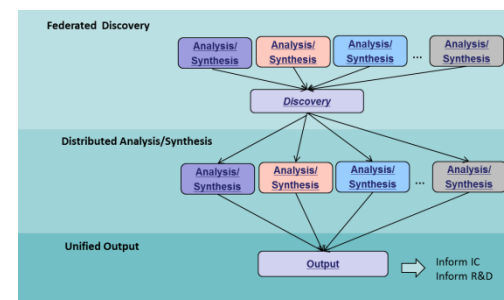
**F2 Anticipate**  
emerging WMD  
threats

## Technology Forecasting Pilot Study October 2013 – May 2014

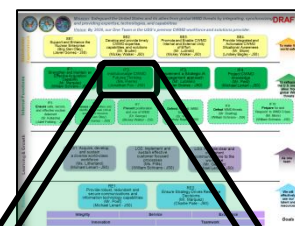


## Discovery Methodologies Assessment August 2014 – March 2015

## DTRA J9 FY17 - 21 Strategic Initiative *Technology-Driven WMD Threat Forecasting*




**Goal: “Develop an Agency capability to anticipate technology-driven emerging/disruptive WMD threats.”**




**iF2 Institutionalize**  
CWMD Futures  
Thinking

<https://www.sbir.gov/sbirsearch/detail/1144473>

<http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20162/index.shtml>




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## Data-Driven Technology Discovery Methodologies

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The official link for this solicitation is: <http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20162/index.shtml>

Agency:	Department of Defense	Release Date:	April 22, 2016
Branch:	n/a	Open Date:	April 22, 2016
Program / Phase / Year:	SBIR / Phase I / 2016	Application Due Date:	June 22, 2016
Solicitation:	<a href="#">DoD SBIR 2016.2</a>	Close Date:	June 22, 2016 (closing in 36 days)
Topic Number:	DTRA162-005		

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**OBJECTIVE:** Develop sustainable and scalable data-driven methodologies to discover emerging or disruptive technologies before they have an innovative impact on WMD and the CWMD mission space. Employing discovery methodologies will enable continuous horizon scanning, and drive technology forecast analysis and reporting to assist the CWMD community of interest (Col) in avoiding technological surprise.

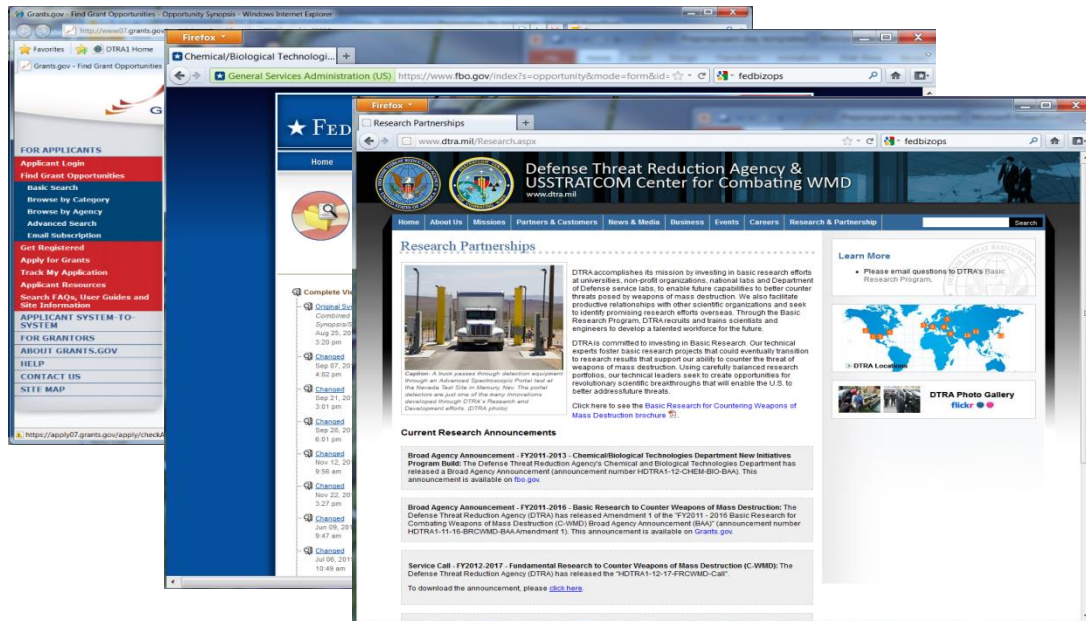
**PHASE I:** Develop a methodology for focused, data-driven discovery of emerging or disruptive technologies and execute a proof of concept deployment of the capability.

Effectiveness will be based on demonstration of the viability of the proposed methodology and the generation of initial outputs permitting further research or analysis on a known technology or technology area. As the challenges within the CWMD mission space range from nuclear, chemical and biological threats, Phase I vendors are encouraged to concentrate on discovery of emerging technologies relevant to future biological weapons threats.

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# Solicitations



We post amendments to BAAs on  
**Grants.gov** and **FBO.gov**

Look for Requests for Proposals (RFPs)  
& Broad Agency Announcement  
(BAAs) solicitations at  
**[www.dtra.mil/research.aspx](http://www.dtra.mil/research.aspx)**

**DTRA-Fundamental Research Broad  
Agency Announcement HDTRA1-09-  
14-FRCWMD-BAA**

**DTRA Basic Research  
Broad Agency Announcement  
HDTRA1-11-16-BRCWMD-BAA**

**[http://www.dtra.mil/Research/Basicand  
AppliedScienceDepartment.aspx](http://www.dtra.mil/Research/BasicandAppliedScienceDepartment.aspx)**

**DTRA-Chemical and Biological Broad  
Agency Announcement HDTRA1-12-  
CHEM-BIO-BAA**



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