



# **DoD R&E Strategy and Focus The Technical Cooperation Program (TTCP)**

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**Acting Assistant Secretary of Defense  
for Research and Engineering**

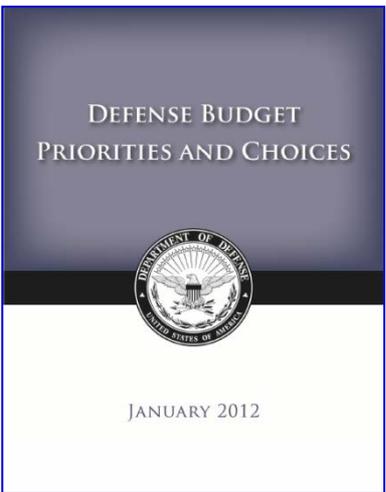
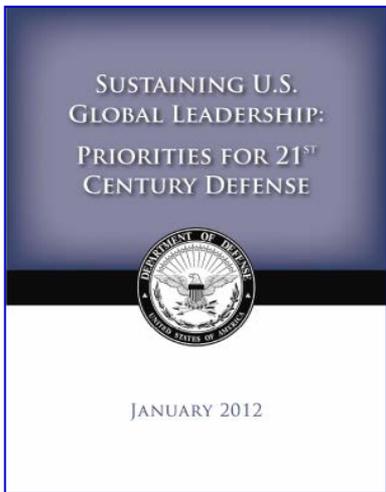
**January 2014**



# Key Elements of Defense Strategic Guidance



- The military will be smaller and leaner, but it will be agile, flexible, ready and technologically advanced.
- Rebalance our global posture and presence to emphasize Asia-Pacific regions.
- Build innovative partnerships and strengthen key alliances and partnerships elsewhere in the world.
- Ensure that we can quickly confront and defeat aggression from any adversary – anytime, anywhere.
- Protect and prioritize key investments in technology and new capabilities, as well as our capacity to grow, adapt and mobilize as needed.



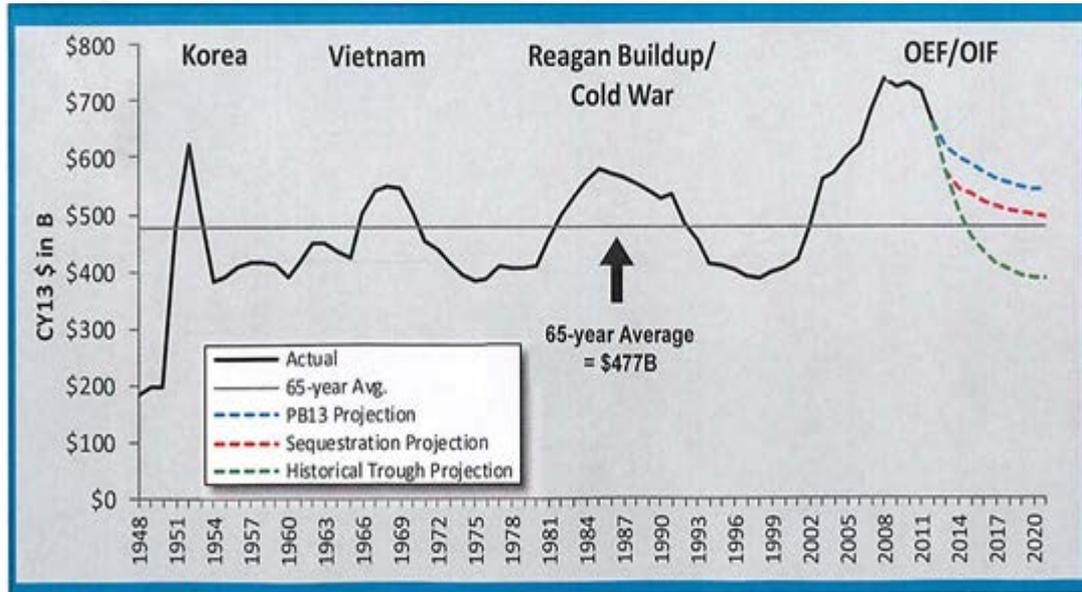


# Budget Challenge Hitting Hard



*“Our current security challenges are more formidable and complex than those we faced in downturns following Korea, Vietnam, and the Cold War. There is no foreseeable “peace dividend” on our horizon.”*

GEN DEMPSEY, CJCS  
Testimony to SASC, 12 Feb 2013



- Sequestration hit 2013- 9% reductions to all accounts
- Dec 2013- Bipartisan Budget not affirmed sequestration but added funds in FY14 - FY15
  - 4% reduction in FY14 (\$-27B)
  - 8% reduction in FY15 (\$-41B)
  - 10% reduction FY16 - FY19

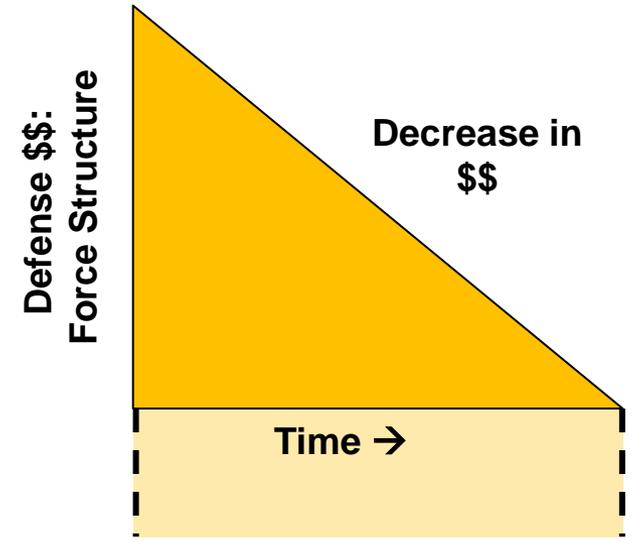
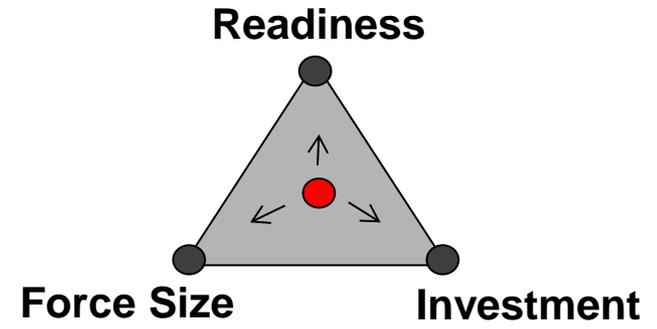
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# “The Orange Triangle”



- Budget Control Act directs \$50Billion reduction each year FY13 – FY22
- Bipartisan budget action provided relief in FY14 & FY15
- Budget has 3 levers:
  - *Readiness*
  - *Force Size*
  - *Investment*
- Therefore, if DoD has the ability to move money, Investment Research Developmental Test & Evaluation (RDT&E) and Procurement will be disproportionately hit over the next couple of years





# Strategic Choices and Management Review

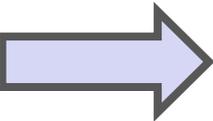
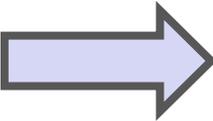


## Two Strategic Choices

Larger force with diminished capability

**or**

Smaller force with technologically dominant capability



## RDT&E Response

Incremental > Innovative

Innovative > Incremental

DoD depends on a strong education system...domestic infrastructure...scientific breakthroughs funded by research and development grants and a strong manufacturing base to maintain our decisive technological edge. –Secretary Hagel Statement on Strategic Choices and Management Review



# USD(AT&L) Priorities

## Concern of Losing Technological Edge



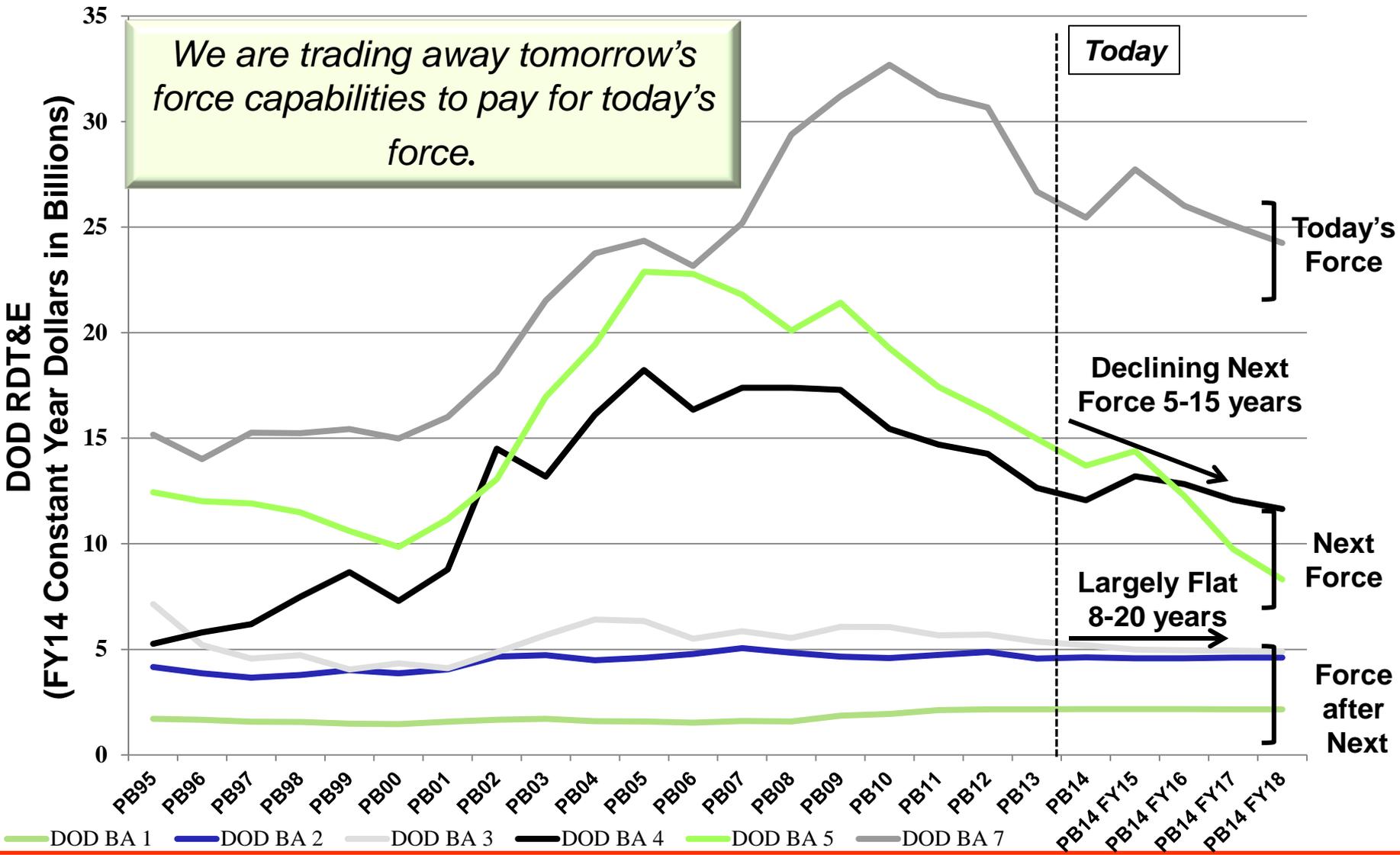
- *“I’m very concerned about eroding technological superiority”*
- DoD’s R&D spending declined 14% since 2009
  - We have to preserve the future capability

**Frank Kendall**  
USD (AT&L)  
*Mr. Kendall on the Department's Technological Edge, January 2014*

*“We're in a cyclical downturn right now. It will end, and then there will be an upturn. The people who are prepared with products that we need or who have done the technology to build the products that we will need will be much better positioned when that upturn occurs.”*

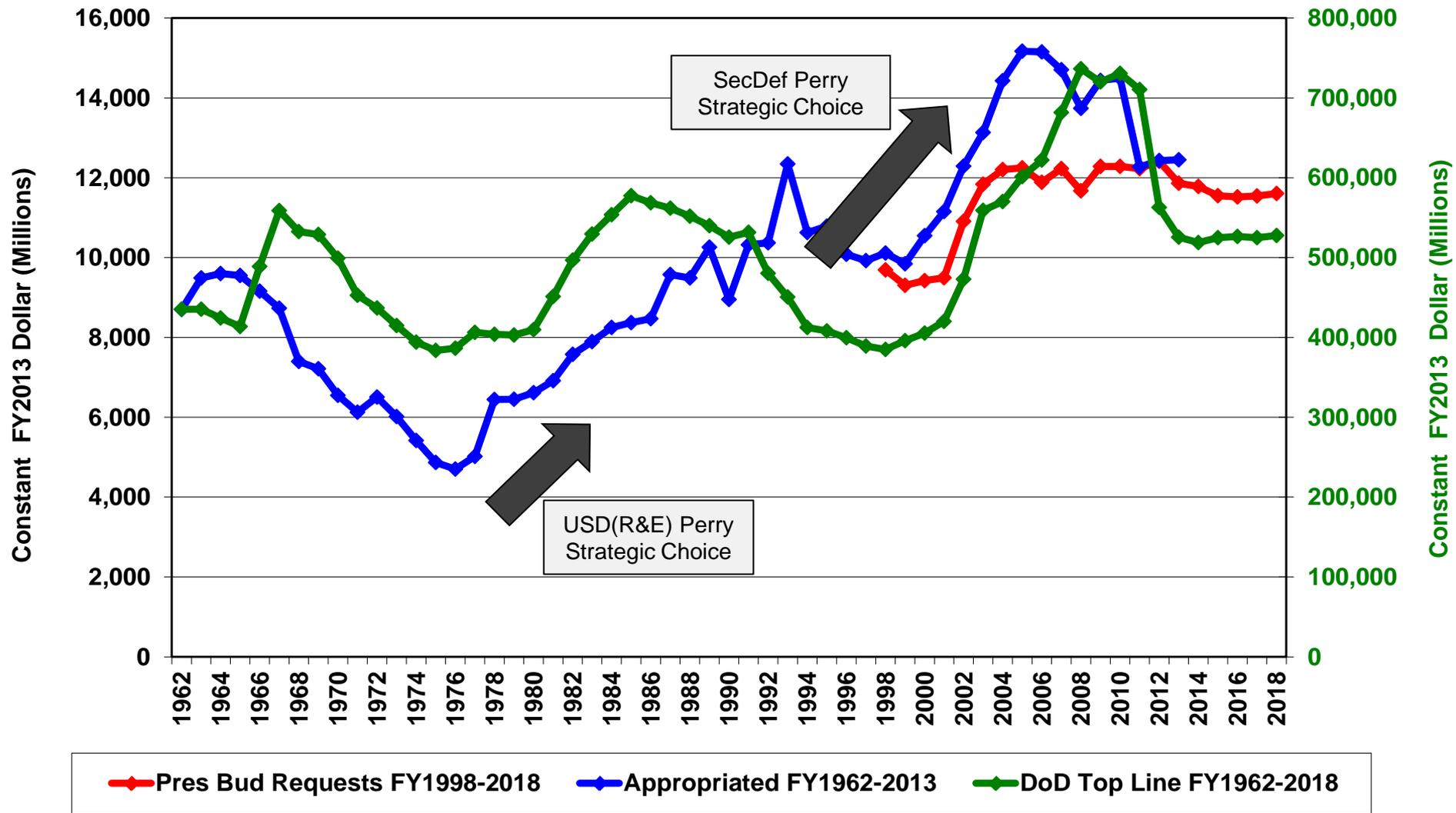


# DOD RDT&E – PBR1995-PBR2014





# During Previous Budget Pressures, DoD Protects the Future through R&E





# Defense R&E Strategy



*“Protect and prioritize key investments in technology and new capabilities, as well as our capacity to grow, adapt and mobilize as needed.”*

-SECDEF, January 2012 Strategic Guidance

## 1. Mitigate new and emerging threat capabilities

- Cyber
- Space Capability
- Electronic Warfare
- Counter-WMD

## 2. Affordably enable new or extended capabilities in existing military systems

- Systems Engineering
- Prototyping
- Develop Test
- Modeling and Simulation
- Interoperability

## 3. Develop technology surprise through science and engineering

- Autonomy
- Human Systems
- Data-to-Decisions
- Basic Research

## Technology Needs

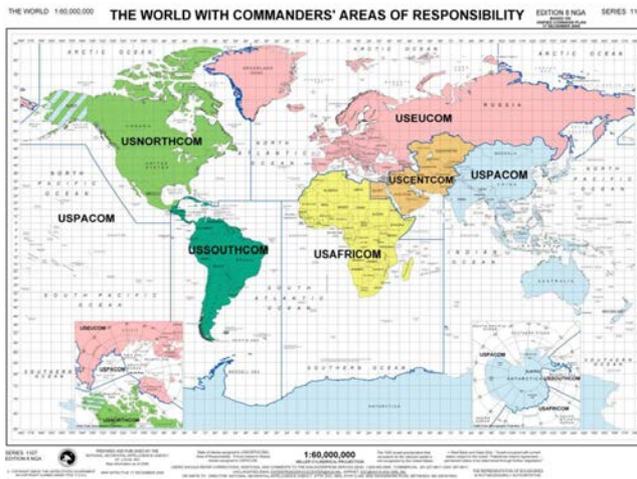
The screenshot displays the Defense Innovation Marketplace website. At the top, there's a navigation bar with 'HOME', 'RESOURCES', 'FAQ', 'NEWS & EVENTS', and 'ABOUT'. Below the navigation bar, the main content area features a large graphic with the text 'DEFENSE INNOVATION MARKETPLACE' and 'CONNECTING INDUSTRY & GOVERNMENT'. The graphic includes icons for various defense agencies and a list of strategic documents. On the right side, there's a vertical list of technology needs: Cyber / Electronic Warfare, Engineering / M & S, Capability Prototyping, Protection & Sustainment, Advanced Machine Intelligence, and Anti-Access/Area Denial. The bottom right corner shows a photograph of a military vehicle.



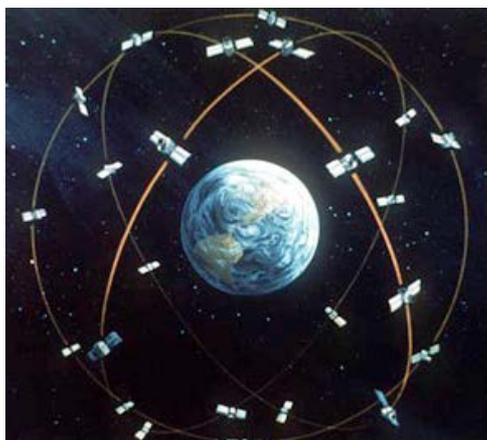
# US S&T – “Focus on the Commons”



**Electronic Warfare**



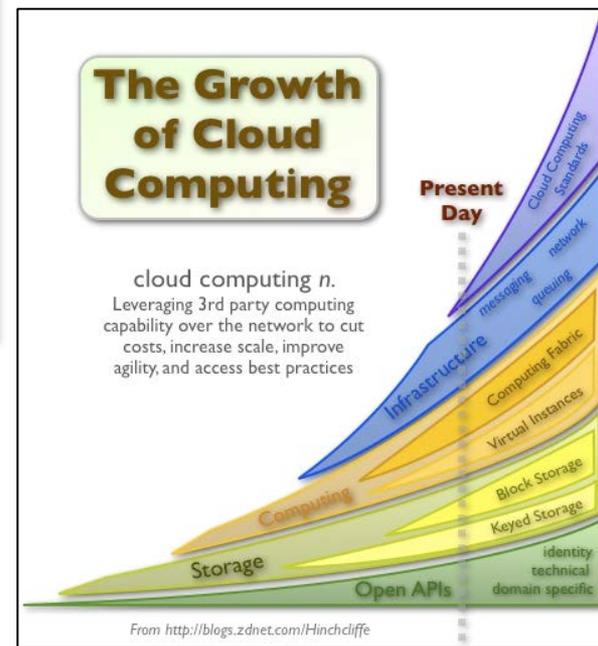
**Oceans**



**Space**



**Cyber**



**Ubiquitous Data**

**Military Operations Increasingly Depend on Being Able to Operate in Places “No One Owns” – *The Enablers***

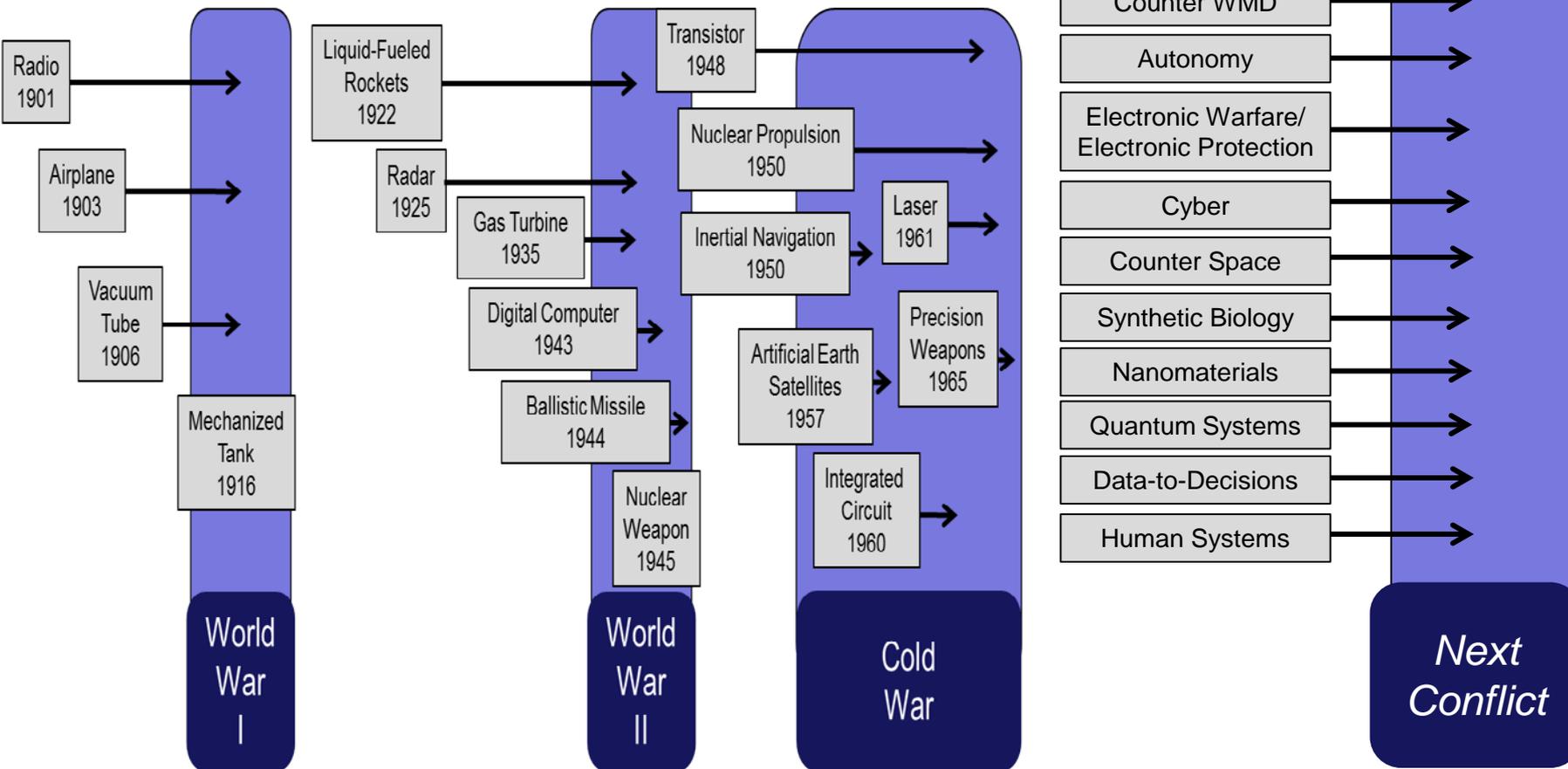


# Add For Any Function

Time

1900 1910 1920 1930 1940 1950 1960 1970 2013 Future

Technology





# Prototyping

**The Department can cost-effectively drive innovation in aviation, space, maritime and ground combat systems through prototyping**

**Proof of Concept:**

**“X”- Plane Prototyping**

**Prototype Development Programs have expanded the state of the possible in military aviation without each necessarily driving a follow-on procurement activity**





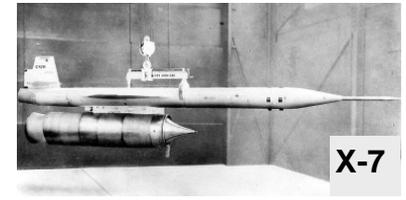
# Capability Prototyping Example: High Speed X-Planes



**X-1**  
First flight: 1947  
Speed: Mach 1.26



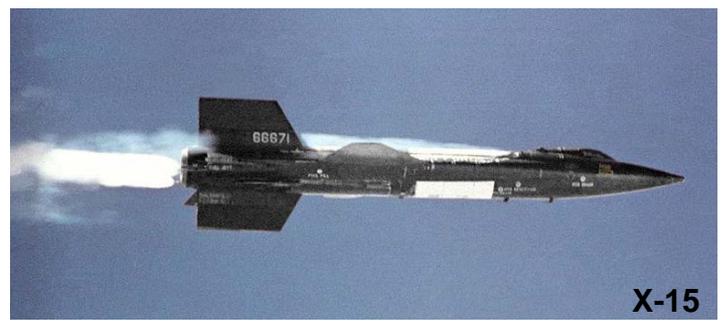
**X-2**  
First flight: 1952  
Speed: Mach 3.2



**X-7**  
First Flight: 1951  
Speed: Mach 4.31



**X-10**  
First Flight: 1953  
Speed: Mach 2



**X-15**  
First Flight: 1959  
Speed: Mach 6.7



**X-43**  
First Flight: 2001  
Speed: Mach 6.83



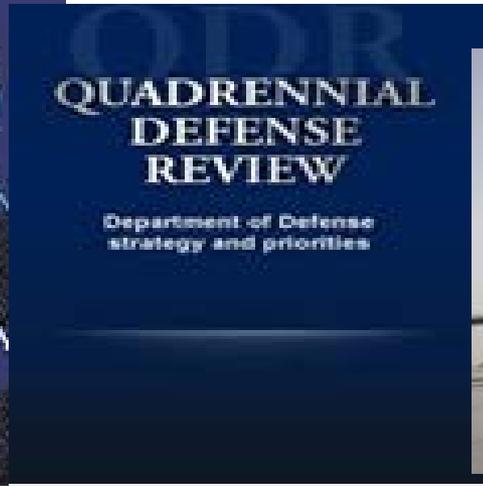
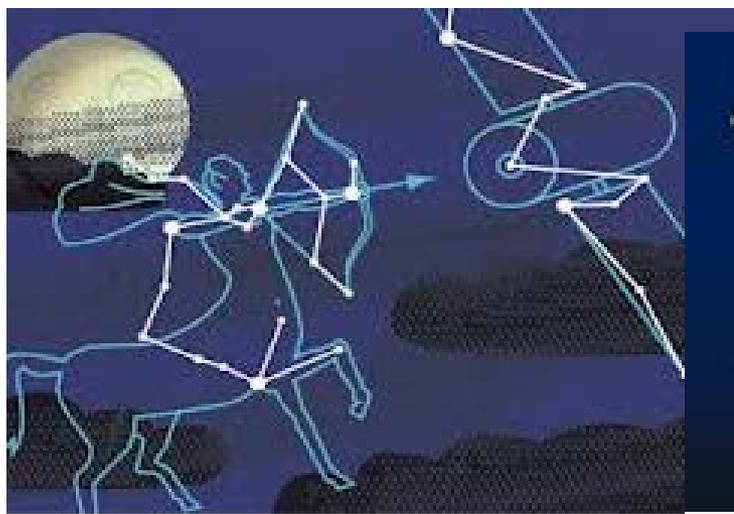
**X-43**  
First Flight: 2010  
Speed: Mach 5.1

The Department can cost-effectively drive innovation in aviation, space, maritime and ground combat systems through prototyping



# Other Issues

- Rise of “Near–Peer” – Phase O/I
  - IP Theft
- Quadrennial Defense Review
- Leaving Afghanistan





***“We are out of money.  
Now we must think!”***



Winston Churchill to  
Parliament during World War II  
*(Stolen from Ernest Rutherford)*