



**Fiscal Year 2012  
President's Budget Request  
for the  
DoD Science & Technology Program  
June 21, 2011**

***Mr. Bob Baker  
Deputy Director, Plans & Programs,  
Assistant Secretary of Defense (Research & Engineering)***



# Outline



- ***Guidance from the Chain of Command***
- ***FY2012 S&T President's Budget Request***
- ***Historical Context***
- ***Strategic Planning & Budget Changes***



# Connecting Researchers to the Warfighter



## President Obama, State of the Union, January 25, 2011



*"The first step in winning the future is encouraging American innovation. Our free enterprise system is what drives innovation. But because it's not always profitable for companies to invest in **basic research**, throughout our history, our government has provided cutting-edge **scientists** and inventors with the support they need.*

*Two years ago, I said that we needed to reach a level of **research and development**, we haven't seen since the Space Race. And in a few weeks I'll be sending a budget to Congress that helps us meet that goal. We'll **invest in biomedical research, information technology, and especially clean energy technology** -- an investment that will strengthen our security, protect our planet, and create countless new jobs for our people.*

*Maintaining our **leadership in research and technology** is crucial to America's success. But if we want to win the future - - if we want innovation to produce jobs in America and not overseas – then we also have to win the race to educate our kids.*

*Over the next 10 years, with so many baby boomers retiring from our classrooms, we want to prepare 100,000 new teachers in the **fields of science and technology and engineering and math.**"*

**Investment in Basic and Applied Research is a commitment to the future warfighter**



# Thoughts from the Secretary of Defense



**Secretary Gates, Budget Rollout  
Hearing 14 Feb 2011**

***“These budget decisions took place in the context of a nearly two year effort by the DoD to reform the way the Pentagon does business – to change how and what we buy... We have protected programs that support military people, readiness, and modernization... We still live in a very dangerous and often unstable world. Our military must remain strong and agile enough to face a diverse range of threats – from non-state actors attempting to acquire and use weapons of mass destruction and sophisticated missiles, to the more traditional threats of other states...”***

***“Directed DoD to fund 2% real growth in Basic Research and to maintain stable funding in the rest of S&T for FY12-FY16. In real terms, the FY12 S&T budget request is almost 29% greater than the request in FY 2000.”*** OSD/PA News Release, 2/14/11



# Continuing the Reform Agenda



***“Budget represents a reasonable, responsible, and sustainable level of funding” - Secretary Gates, Budget Rollout Brief (2/14/2011)***

- **Taking Care of People**
- **Rebalancing Military Capabilities**
- **Reforming What and How We Buy**
- **Supporting our Troops in the Field**





# ASD(R&E) Imperatives



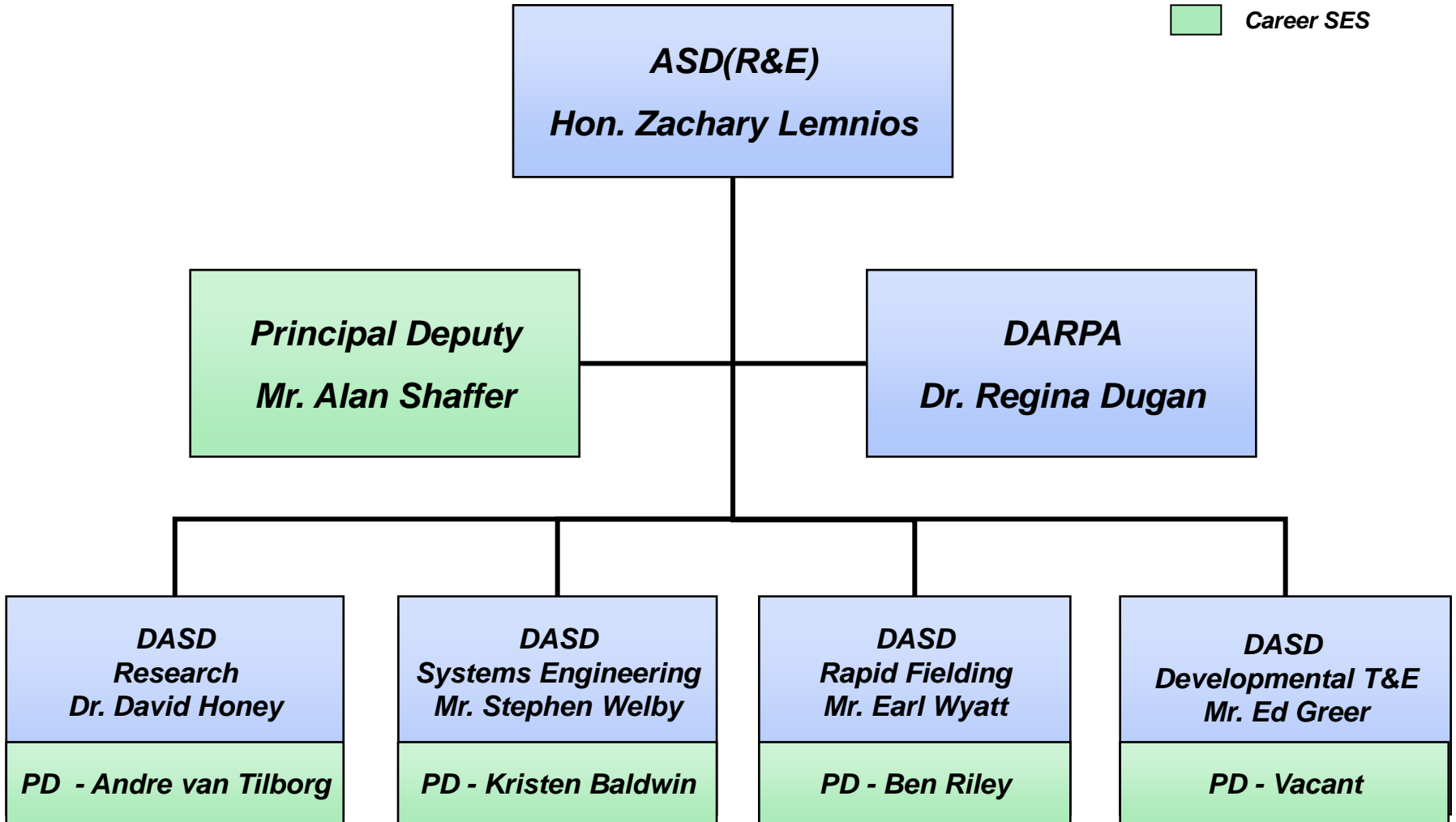
- **Accelerate delivery of technical capabilities to win the current fight.**
  - Solve the most difficult near term problems and transition compelling concepts to the warfighter.
- **Prepare for an uncertain future.**
  - Shape the Department's science and technology investments to open options that counter (and create) strategic surprise.
- **Reduce the cost, acquisition time and risk of our major defense acquisition programs.**
  - Provide systems engineering leadership, deep system analysis, and technical assessments across the Department.
- **Develop world class science, technology, engineering, and mathematics capabilities for the DoD and the Nation.**



# ASD(R&E) – Organization



 *Political appointee*  
 *Career SES*





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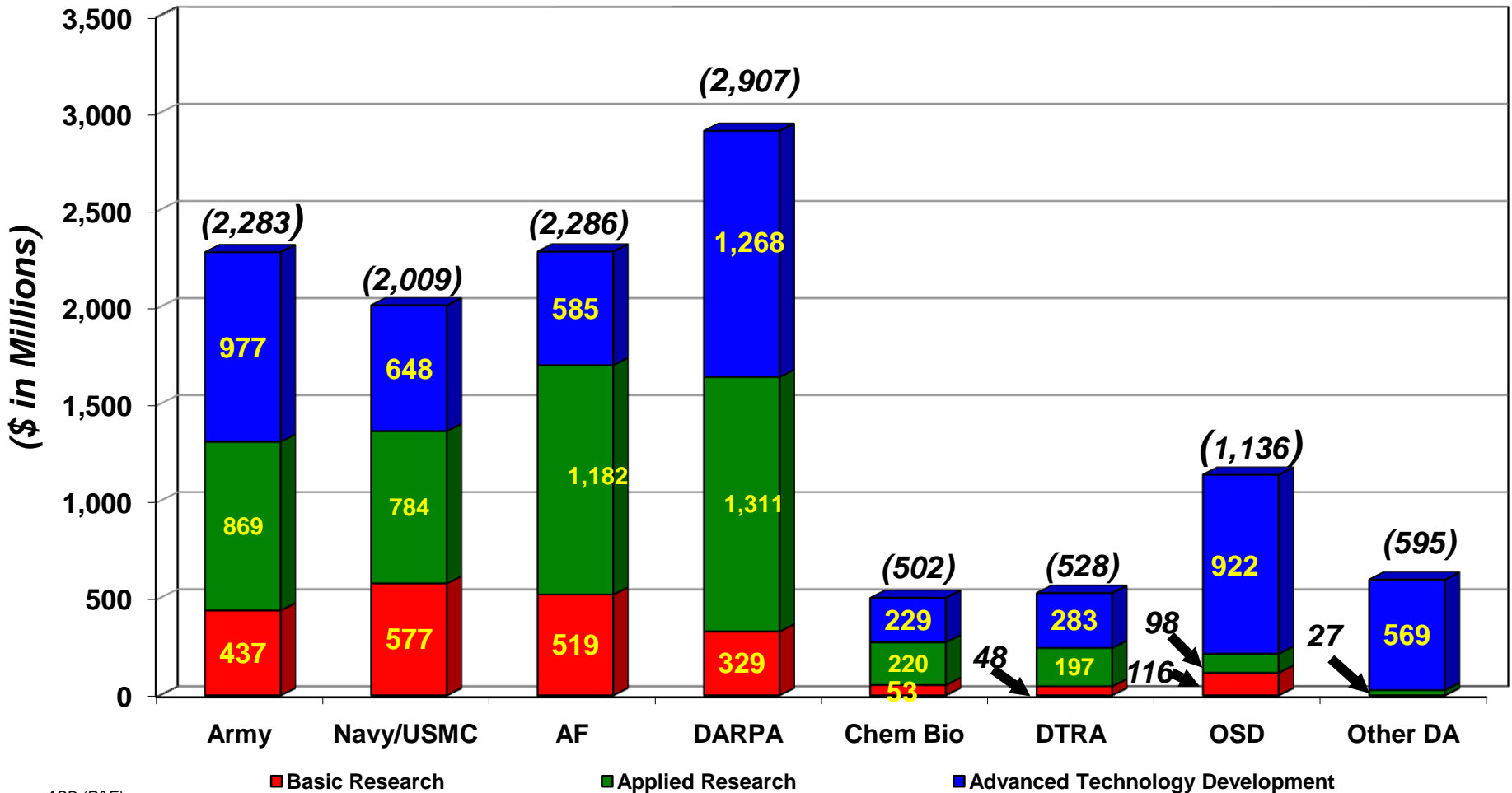
# FY12 DoD S&T Budget Request



**Total FY12 S&T request = \$12.25B**

**Total FY11 S&T Request = \$11.82B**

Army = 1,945 Navy = 1,961 AF = 2,191 DARPA = 3,026 ChemBio = 396 DTRA = 555 OSD = 1,356 Other DA = 389





# FY12 President's Budget Request



BP12	BA	FY11	FY12	FY13	FY14	FY15	FY16
		PBR 11	PB12 CIS	PB12 CIS	PB12 CIS	PB12 CIS	PB12 CIS
DoD	BA 1	1,998,797	2,078,470	2,137,917	2,221,206	2,305,688	2,404,212
DoD	BA 2	4,475,822	4,687,273	4,680,455	4,712,527	4,758,137	4,854,129
DoD	BA 3	5,344,430	5,481,225	5,765,877	5,874,758	6,028,726	6,126,183
	<b>DoD S&amp;T</b>	<b>11,819,049</b>	<b>12,246,968</b>	<b>12,584,249</b>	<b>12,808,491</b>	<b>13,092,551</b>	<b>13,384,524</b>
Army	BA 1	406,873	436,920	440,492	456,268	470,582	487,449
	BA 2	841,364	869,332	860,648	856,203	840,534	832,660
	BA 3	696,592	976,812	949,153	983,936	966,542	983,685
	<b>Army S&amp;T</b>	<b>1,944,829</b>	<b>2,283,064</b>	<b>2,250,293</b>	<b>2,296,407</b>	<b>2,277,658</b>	<b>2,303,794</b>
Navy	BA 1	556,425	577,372	599,398	622,310	646,079	670,756
	BA 2	678,680	783,794	782,973	772,408	809,831	821,744
	BA 3	725,599	648,217	606,260	641,203	629,779	641,636
	<b>Navy S&amp;T</b>	<b>1,960,704</b>	<b>2,009,383</b>	<b>1,988,631</b>	<b>2,035,921</b>	<b>2,085,689</b>	<b>2,134,136</b>
AIR FORCE	BA 1	500,473	518,859	538,233	558,331	579,179	600,805
	BA 2	1,181,420	1,181,874	1,187,232	1,203,560	1,227,057	1,250,541
	BA 3	509,305	585,404	562,607	579,470	590,288	600,329
	<b>Air Force S&amp;T</b>	<b>2,191,198</b>	<b>2,286,137</b>	<b>2,288,072</b>	<b>2,341,361</b>	<b>2,396,524</b>	<b>2,451,675</b>
Def-Agencies	BA 1	535,026	545,319	559,794	584,297	609,848	645,202
	BA 2	1,774,358	1,852,273	1,849,602	1,880,356	1,880,715	1,949,184
	BA 3	3,412,934	3,270,792	3,647,857	3,670,149	3,842,117	3,900,533
	<b>Def-Agencies S&amp;T</b>	<b>5,722,318</b>	<b>5,668,384</b>	<b>6,057,253</b>	<b>6,134,802</b>	<b>6,332,680</b>	<b>6,494,919</b>



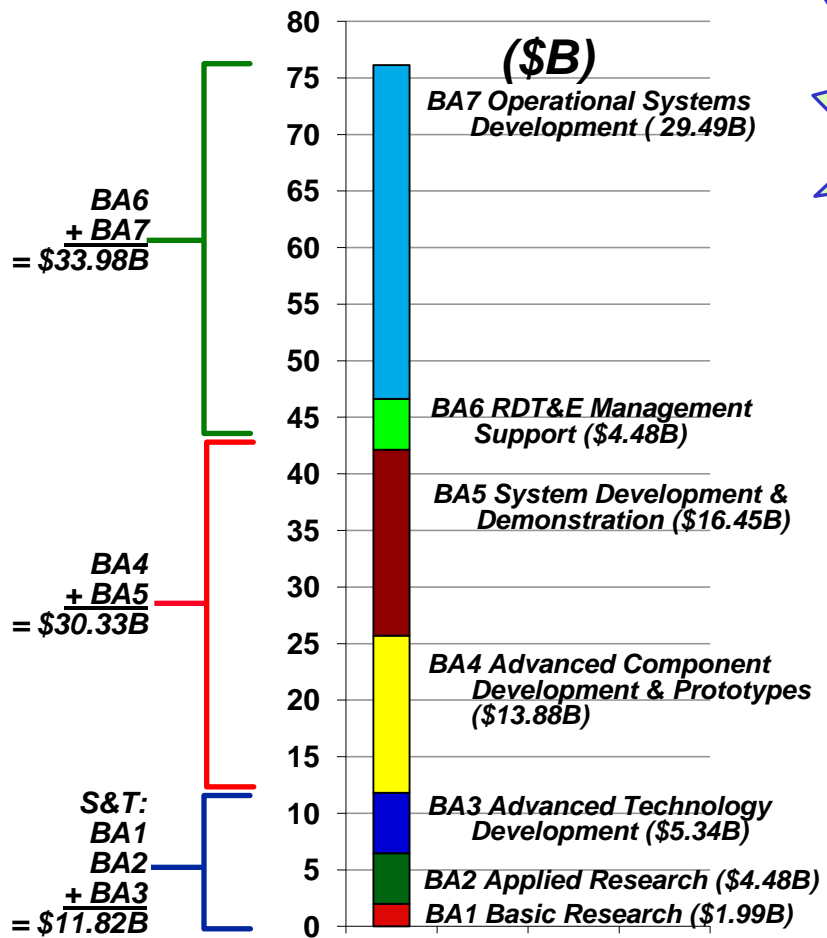
# FY11 and FY12 RDT&E Budget Request Comparison



- in Then Year Dollars -

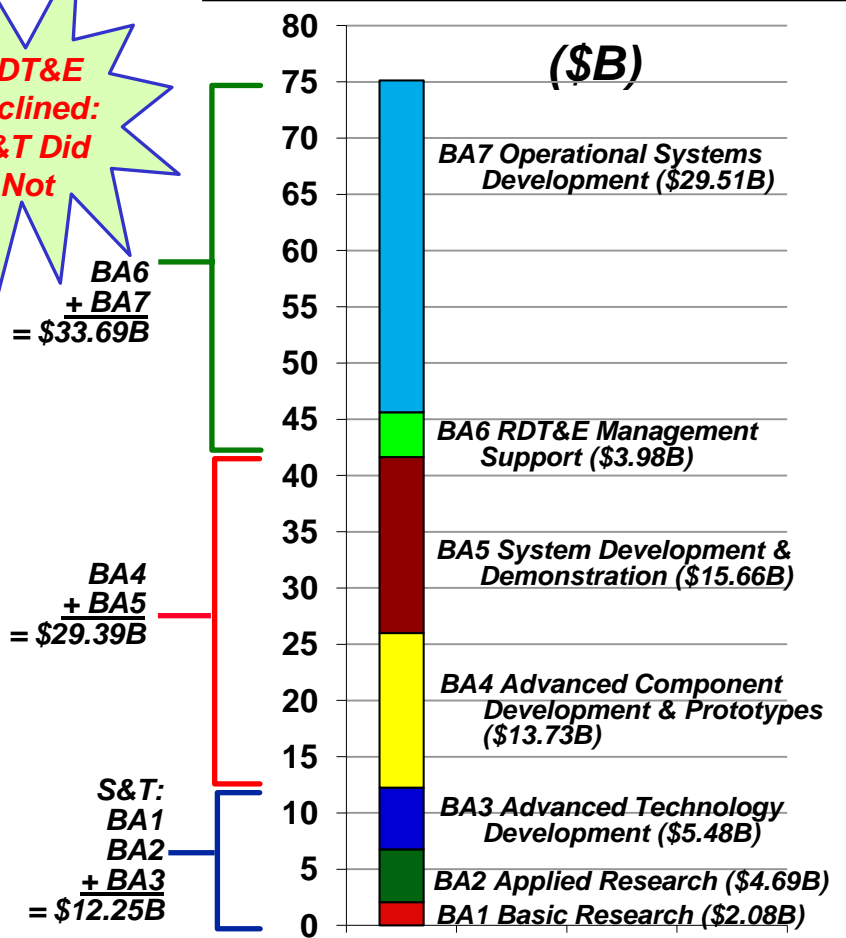
**FY11 RDT&E request = \$76.13B**  
(Budget Activities 1-7)

**FY12 RDT&E request = \$75.33B**  
(Budget Activities 1-7)



**RDT&E Declined:  
S&T Did Not**

BA6 + BA7 = \$33.69B



Technology Base (BA1 + BA2) = \$6.47B

Technology Base (BA1 + BA2) = \$6.77B

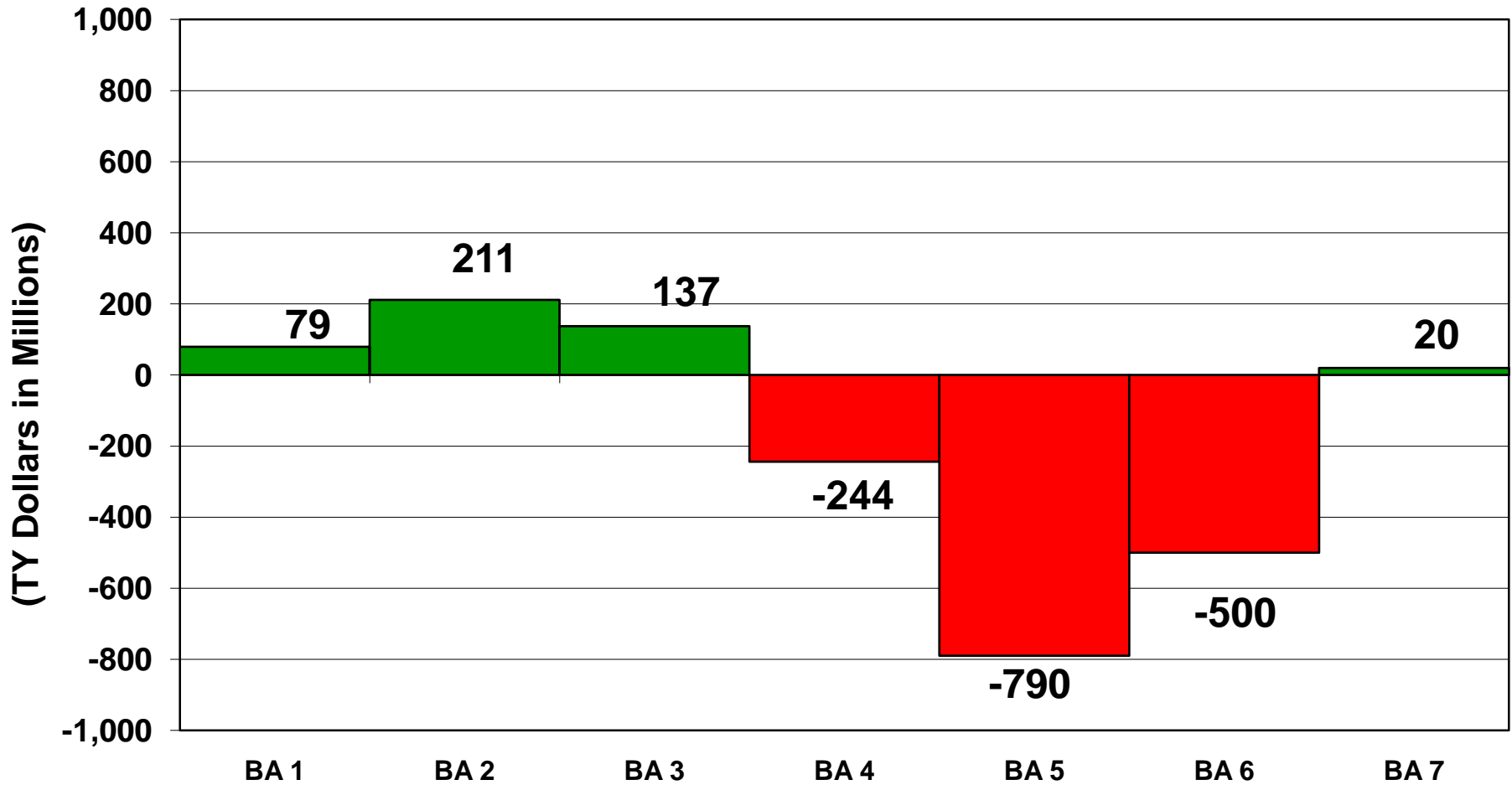
**PBR11 S&T is 15.5% of RDT&E**

**PBR12 S&T is 16.2% of RDT&E**



# RDT&E Budget Request Overview

## - FY11 and FY12 Comparison -





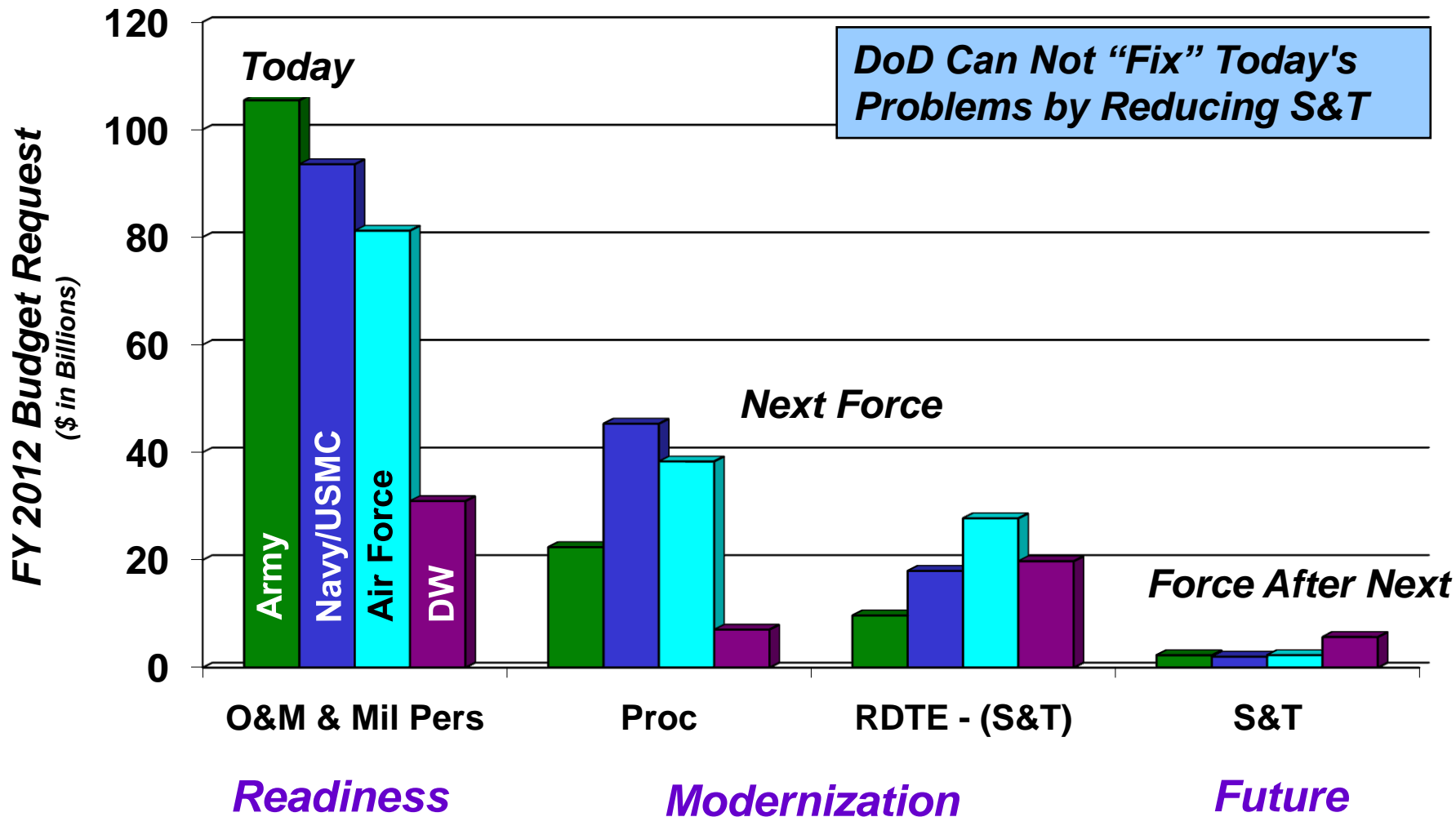
# FY12 DoD R&E Budget Request Comparison



	PBR 2010	PBR 2011 (CY FY11 \$)	PBR 2012 (CY FY11 \$)	Real Change from PBR11 to PBR12 (CY FY11 \$)
Basic Research (BA 1)	1,798	1,999	2,078 (2,043)	+2.2%
Applied Research (BA 2)	4,247	4,476	4,687 (4,608)	+2.9%
Advanced Technology Development (BA 3)	5,605	5,344	5,481 (5,388)	0.8%
<b>DoD S&amp;T</b>	<b>11,649</b>	<b>11,819</b>	<b>12,247 (12,039)</b>	<b>1.9%</b>
Advanced Component Development and Prototypes (BA 4)	14,306	13,877	13,733 ( 13,401)	-3.4%
<b>DoD R&amp;E (BAs 1 – 4)</b>	<b>25,956</b>	<b>25,696</b>	<b>25,880 (25,440)</b>	<b>-1.0%</b>
<b>DoD Topline</b>	<b>533,813</b>	<b>549,093</b>	<b>566,341 (556,710)</b>	<b>+1.4%</b>



# FY12 Technology Investment Compared to Other DoD Categories

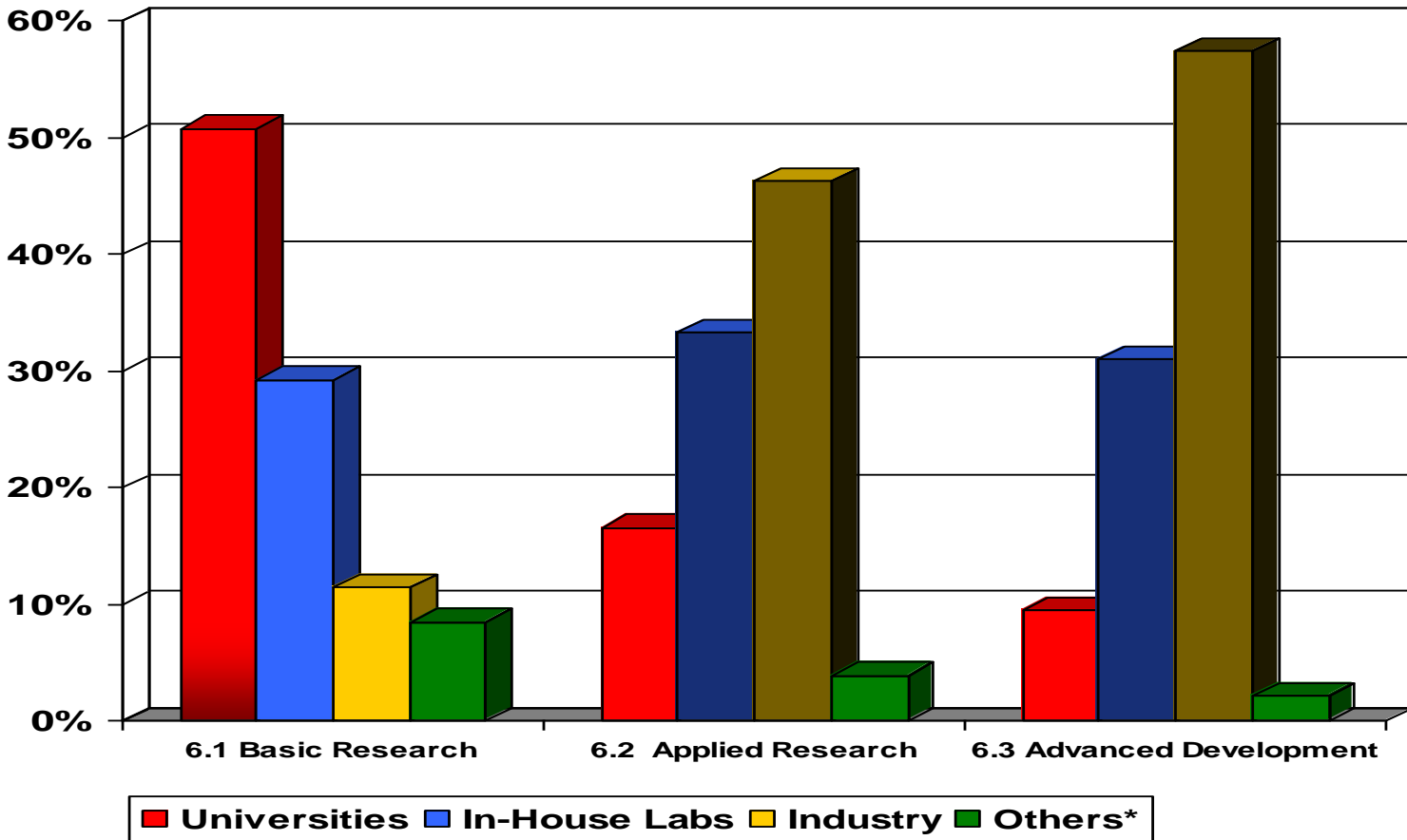




# Recipients of DoD S&T Funds



DoD S&T Funding Recipients by Percentage  
(PBR08)



\*Includes non-profit institutions, State & local gov., & foreign institutions

Source: National Science Foundation Report (PBR08)



# Outline



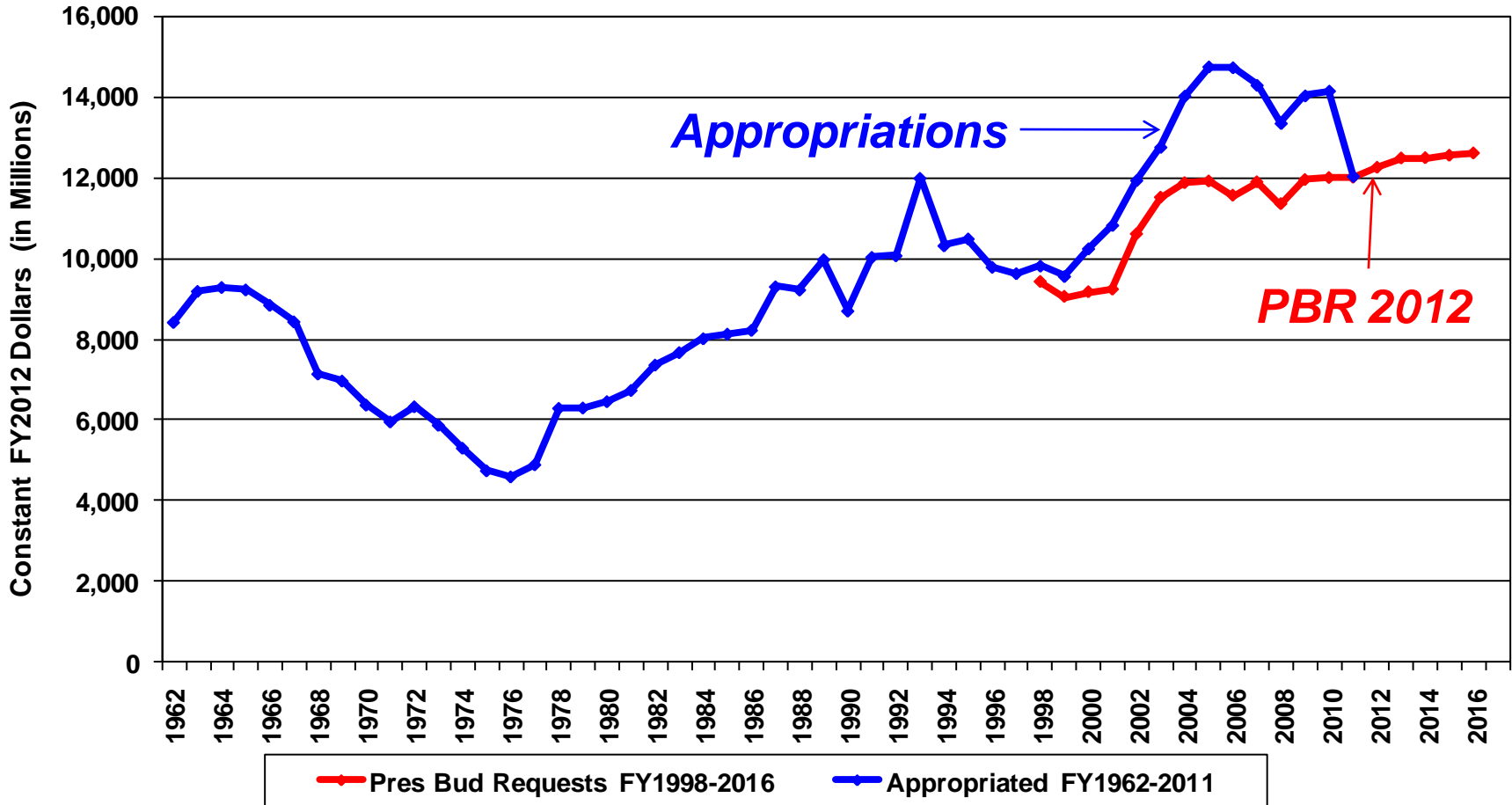
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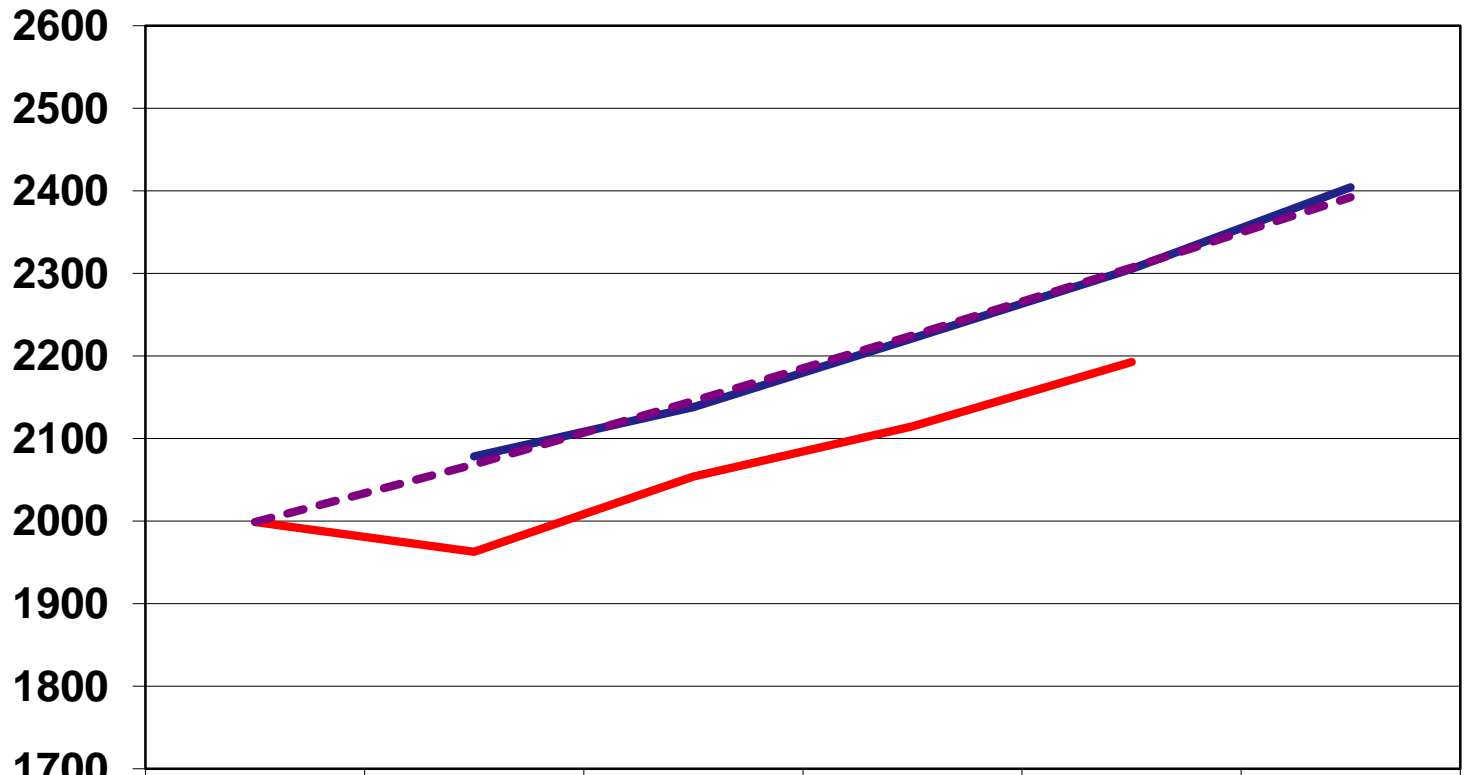
# DoD S&T FUNDING: FY1962-2016

(Constant FY12 Dollars)





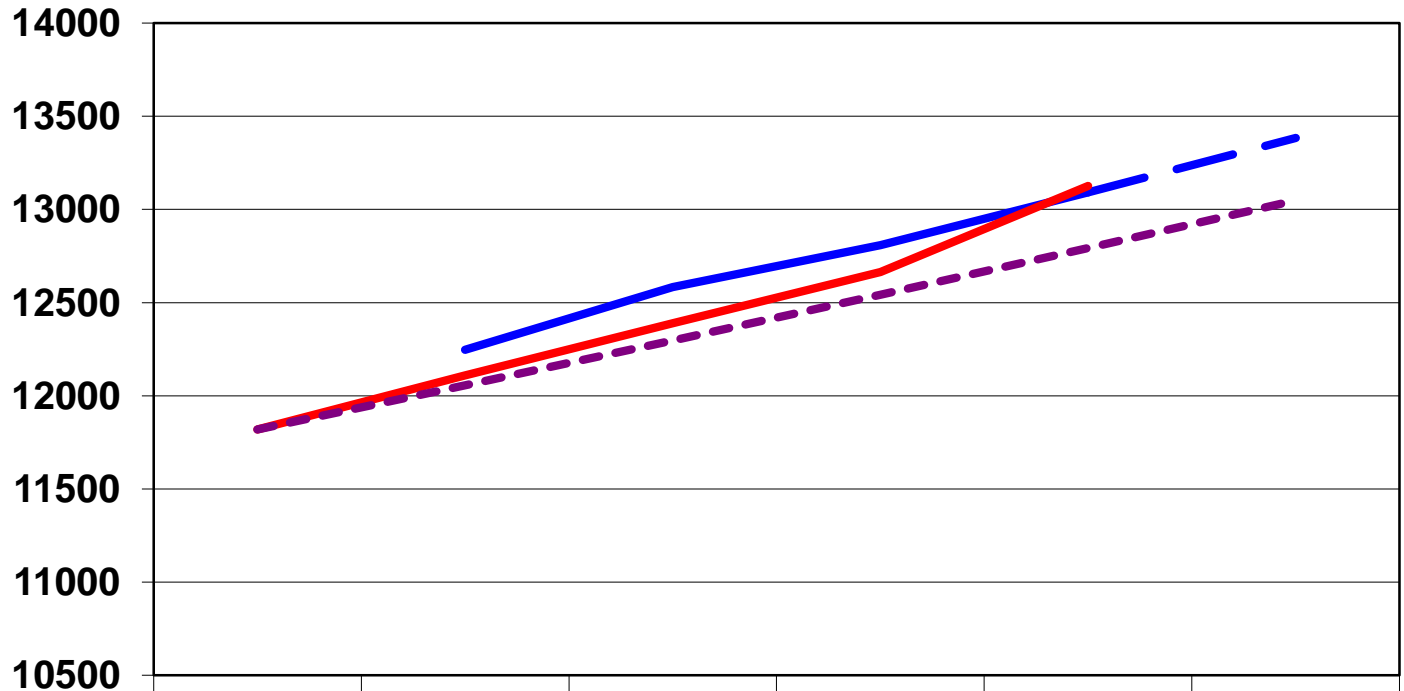
# DoD Basic Research (TY Dollars in Millions)



	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
<b>PBR-12</b>		<b>2,078</b>	<b>2,138</b>	<b>2,221</b>	<b>2,306</b>	<b>2,404</b>
<b>PBR-11</b>	<b>1,999</b>	<b>1,963</b>	<b>2,054</b>	<b>2,115</b>	<b>2,193</b>	
<b>2% RPG</b>	<b>1,999</b>	<b>2,069</b>	<b>2,145</b>	<b>2,225</b>	<b>2,307</b>	<b>2,392</b>
<b>Δ - PBR11 versus PBR12</b>		<b>116</b>	<b>84</b>	<b>106</b>	<b>113</b>	



# DoD Science & Technology (TY Dollars in Millions)

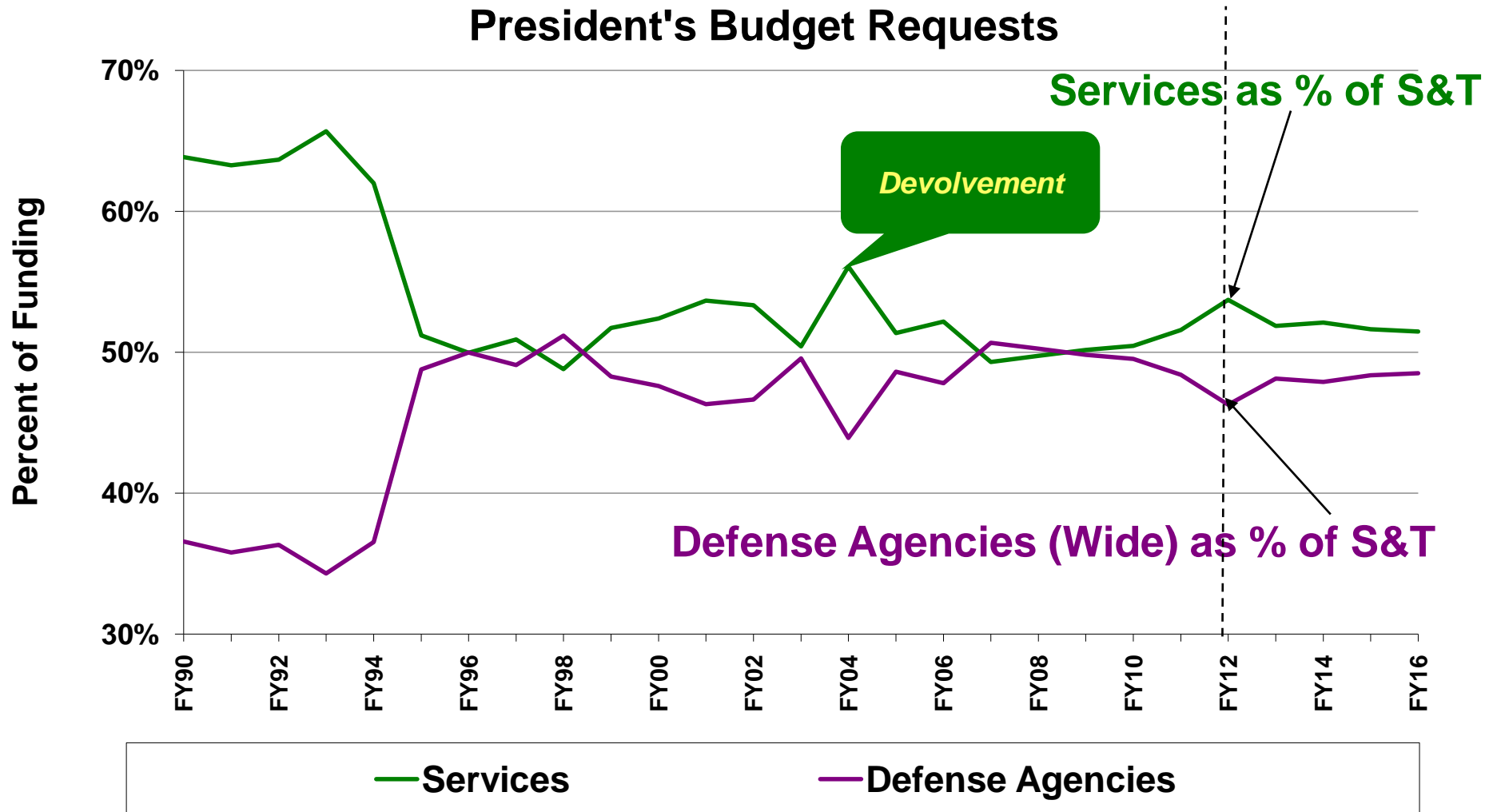


	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
<b>— PBR-12</b>		12,247	12,584	12,808	13,093	13,385
<b>— PBR-11</b>	11,819	12,109	12,390	12,663	13,125	
<b>- - 0% RPG</b>	11,819	12,055	12,297	12,542	12,793	13,049
<b>Δ - PBR12 versus PBR11</b>		138	194	145	-33	



# S&T Breakout

- Services and Defense Agencies (Wide) as % of Total S&T -





# Outline

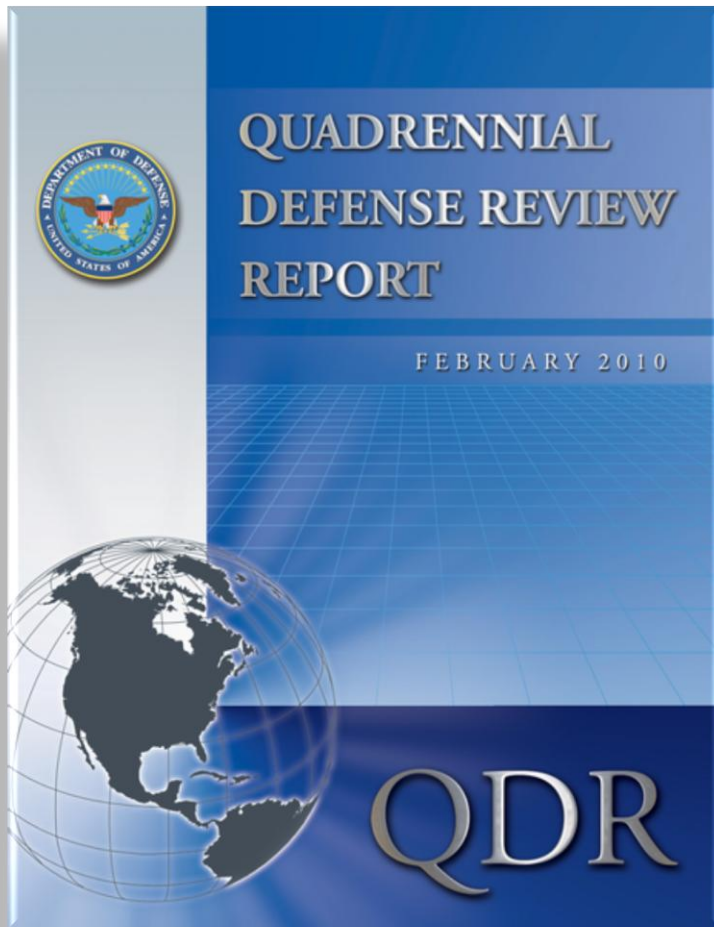


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# Quadrennial Defense Review Key Mission Areas (KMAs)



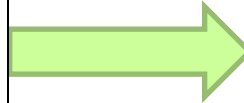
- 1. Defend the United States and Support Civil Authorities at Home***
- 2. Succeed in Counterinsurgency, Stability, and Counterterrorist Operations***
- 3. Build the Security Capacity of Partner States***
- 4. Deter and Defeat Aggression in Anti-Access Environments***
- 5. Prevent Proliferation and Counter Weapons of Mass Destruction***
- 6. Operate Effectively in Cyberspace.***



# QDR 2006 vs. QDR 2010

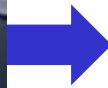
## QDR 2006 Strategic Outcomes

1. *Defend the Homeland in Depth*
2. *Defeat Terrorist Networks*
3. *Shape the Choices of Countries at Strategic Crossroads*
4. *Prevent the Acquisition or use of Weapons of Mass Destruction*



## QDR 2010 Key Mission Areas

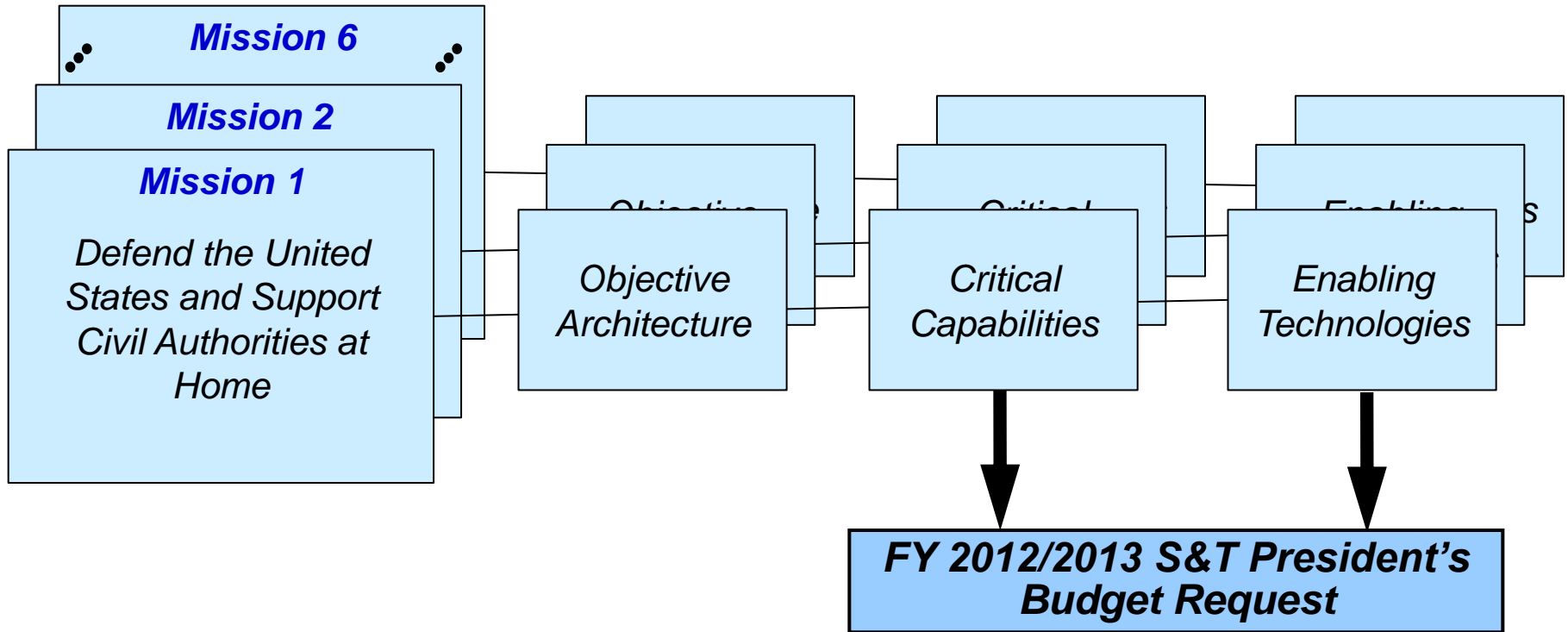
1. *Defend the United States and Support Civil Authorities at Home*
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4. *Deter and Defeat Aggression in Anti-Access Environments*
5. *Prevent Proliferation and Counter Weapons of Mass Destruction*
6. *Operate Effectively in Cyberspace*



**QDR 2010 Builds on QDR 2006  
- Anti-Access and Cyberspace are New -**



# QDR Key Mission Area Studies Approach







# Priority S&T Investment Areas for FY 2013-2017



- **Data-to-Decisions**
  - Science and applications to reduce the cycle time and manpower requirements for analyses and use of large data sets.
- **Engineered Resilient Systems**
  - Engineering concepts, science, and design tools to protect against malicious compromise of weapon systems, and to develop agile manufacturing for trusted and assured defense systems.
- **Cyber Science and Technology**
  - Science and technology for efficient, effective cyber capabilities across the spectrum of joint operations.
- **Electronic warfare / Electronic protection**
  - New concepts and technology to protect systems and extend capabilities across the electromagnetic spectrum.
- **Counter Weapons of Mass Destruction (WMD)**
  - Advances in DoD's ability to locate, secure, monitor, tag, track, interdict, eliminate, and attribute WMD weapons and materials.
- **Autonomy**
  - Science and technology to achieve autonomous systems that reliably and safely accomplish complex tasks in all environments.
- **Human Systems**
  - Science and technology to enhance human-machine interfaces to increase productivity and effectiveness across a broad range of missions.



# Big Moves DoD Wide



## FY2012

Program	Funding (Increase from FY11PBR-FY12PBR)	Agency
<b><i>Taking Care of People</i></b>		
1 Defense Health	~ \$ 125 M	DHP; Services
<b><i>Force Protection</i></b>		
2 Chemical Bio-Defense Program	~ \$ 100 M	NCB
3 Cyber S&T	~ \$ 76 M	DARPA
4 Force Protection	~ \$ 49 M	Navy & Army
5 RF Systems	~ \$ 45 M	Navy
<b><i>Prepare for Uncertain Future</i></b>		
6 Info & Communications Technology	~ \$ 120 M	DARPA; AF
7 Weapons Technology	~ \$ 62 M	Services
8 Undersea Warfare	~ \$ 30 M	Navy
TOTALS	~ \$ 607 M	



# Big S&T Moves, Last Three Budgets



## ***FY2010 (~\$1.8B across the FYDP)***

**Medical S&T (Wounded Warrior) (~\$2.5B total; ~\$1B in S&T, remainder DHP)**

**Large Data Handling (ISR Cap) ~ \$100M)**

**Cyber Protection (~ \$100 M)**

**Anti-Tamper (~\$33M)**

**High Temperature Materials (~\$70M)**

**Stand-off Detection of Fissile Materials (~\$300)**

**High Performance Computing (~\$100M)**

**Minerva (Sociology Research) (~\$100M)**

## ***FY2011 (~\$1.6B across the FYDP)***

**7% increase in FY11 Basic (6.1) and Applied Research (6.2) from FY10 base (~\$544M )**

**Deployable Force Protection (~\$238M)**

**Cyber Security Research (~\$200M)**

**Night Vision Technology-Advanced Focal Plane Array (\$94M)**

**High Energy Laser Advanced Technology (\$512M)**

## ***FY2012 (~\$0.6B; \$3.0 B across the FYDP)***

**Protection of Defense Health (\$125 M)**

**Information and Communication Technology (\$120 M)**

**Force Protection Technology (\$49 M)**

**Chemical and Biological Defense Technology (\$100 M)**

**Cyber Security (\$76 M)**

**Advanced Undersea Warfare Applied Research (\$30 M)**

<b>Key</b>
<b>Joint Programs</b>
<b>Multiple Executors</b>
<b>Army</b>
<b>Navy</b>
<b>Air Force</b>



# Summary



- **Overall S&T up 1.9% (in real terms) from FY11 PBR**
  - **Grew at a faster rate than DoD top line (1.4%)**
  - **All three categories (6.1, 6.2, 6.3) had real growth**
  - **RDT&E is down, but S&T is up**
- **Met SECDEF Guidance**
- **Big Moves Included:**
  - **Protection of Defense Health Program**
  - **Information and Communications Technology**
  - **Cyber S&T**
  - **Force Protection**
  - **Chemical and Biological Research**
  - **Weapons Technology**