



***Process Used to Develop the DoD
Science & Technology Priorities
November 8, 2011***

Mr. Bob Baker

Deputy Director, Plans & Programs

Assistant Secretary of Defense (Research & Engineering)



Process Began With the 2010 QDR

-- February 2010 --



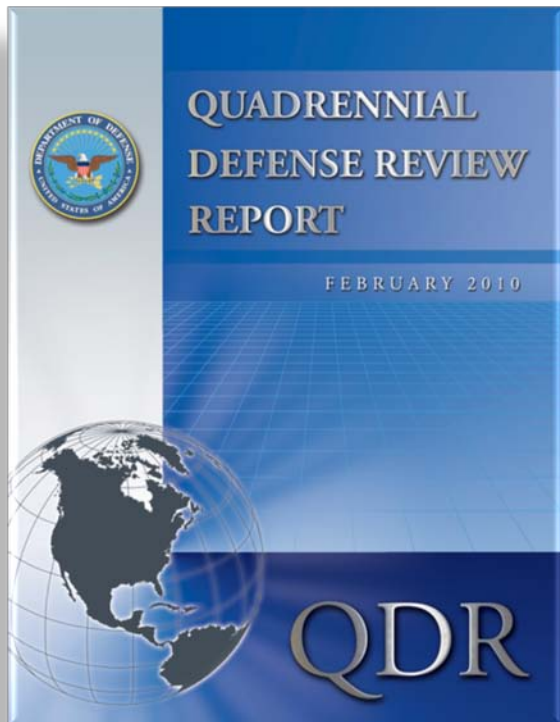
□ The 2010 QDR identified 6 Key Mission Areas (KMAs) that DoD should build capability capacity to be successful in the future global security environment

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





QDR Key Mission Areas and Department Planning and Programming Guidance (DPPG) Tasking



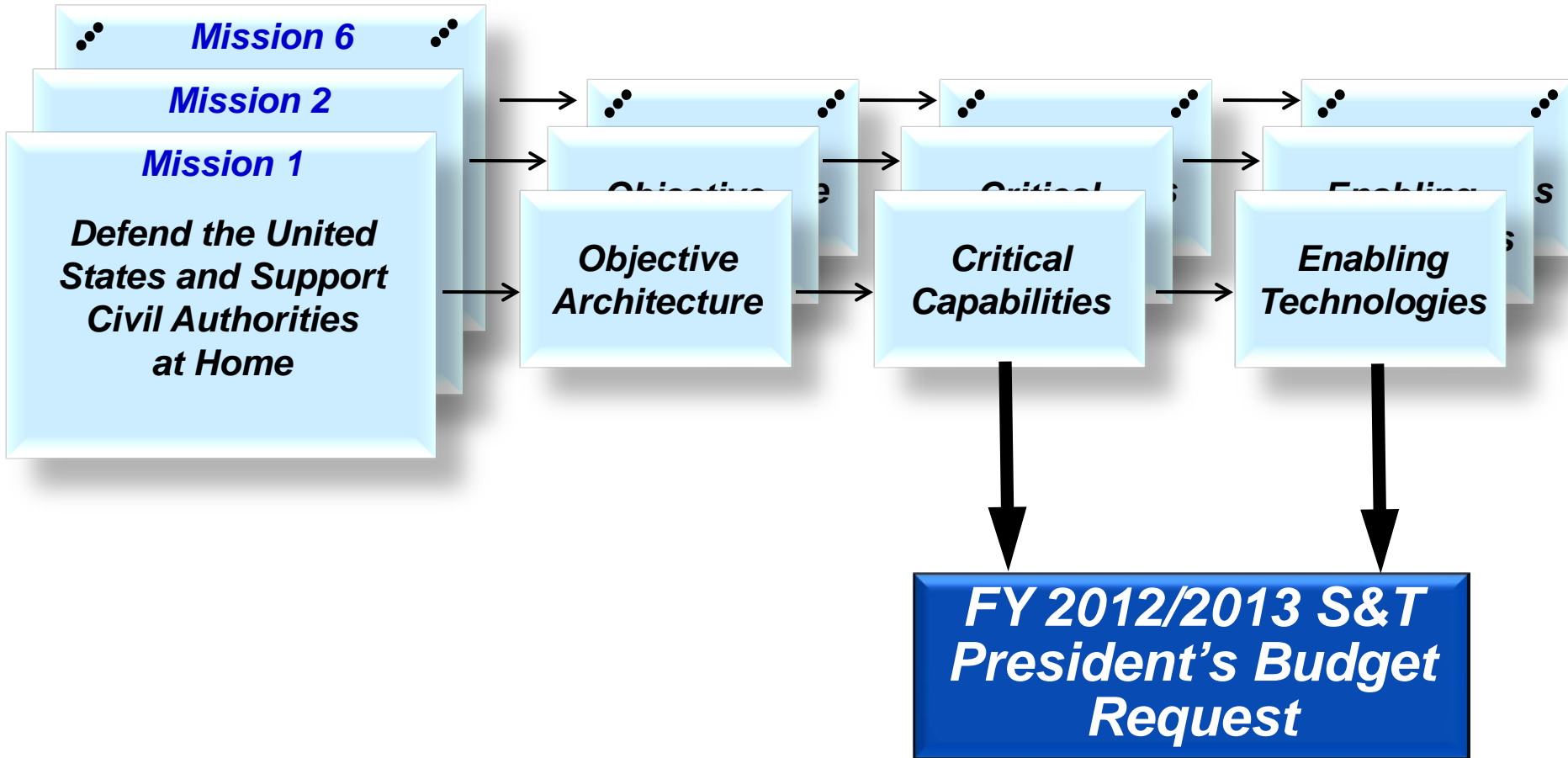
Key Mission Areas
Defend U.S. and Support Civil Authorities at Home
Succeed in COIN/Stability/CT Ops
Build Partner Security Capacity
Deter and Defeat Aggression in Anti-Access Environments
Prevent Proliferation and Counter WMD
Operate Effectively in Cyberspace

DPPG Task: “The DDR&E, with the support of the Secretaries of the Military Departments, Directors of the Defense Agencies, and CJCS will lead an effort across the Department to **identify the core capabilities and enabling technologies for each of the six QDR key mission areas.**”

-- July 12, 2010 --

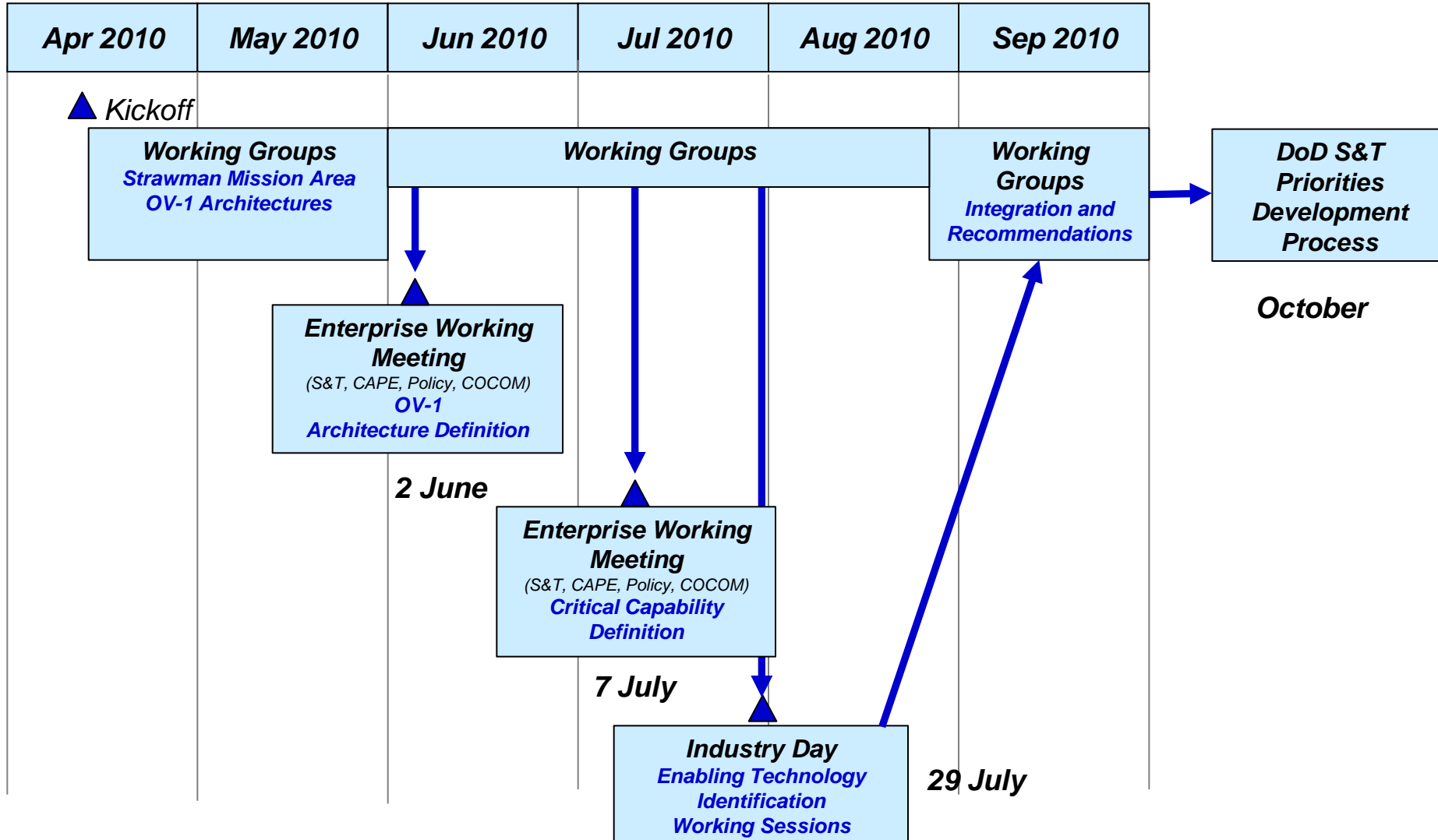


QDR KMA Study Approach





QDR KMA Study Timeline





Single-Service Led S&T Priorities



- **Army**
 - Immersive Training
- **Navy**
 - Undersea Warfare
- **Air Force**
 - Long Range Strike
 - Affordable Space Access

Note: The QDR KMAs are additive to core military missions and competencies assigned to the Armed Forces



Initial S&T Priorities - 54 Total - Reduced to 7 -



- **QDR KMA DPPG Study:**

- Data to Decisions
- Systems 2020
- Immersive Training
- Autonomy for Standoff, Speed & Scale
- Human Terrain Preparation
- CBRN Standoff Detection, Locate, Monitor & Track
- Cyber Mission Assurance/Dominance -Includes Trust & Attribution
- Rapidly Tailored Effects
- EM Spectrum Management
- Knowledge and Information Management / Architecture
- Ubiquitous Observation
- Access and Sharing of DoD Information/Databases
- Alternatives to GPS for providing PNT
- Contextual Exploitation

- **TFTs and COIs:**

- High Speed / Hypersonics



Initial S&T Priorities - 54 Total - Reduced to 7 (contd.) -



- **TFTs and COIs (contd.)**
 - Highly Adaptive Turbine Engines
 - Multi Role Vertical Lift
 - Reasoning Machines
 - Teaming Large Numbers of Autonomous Hetero. Systems
 - Developing Materials Underpinning Electronics Technologies
 - Force Protection
 - Mobility
 - Integrated Computational Materials Science and Engineering (ICMSE)
 - Complex Engineered Materials
 - Improved Kinetic Weapons
- **Service and Agency Priorities**
 - Autonomy
 - Power & Energy
 - Total Ownership Cost
 - Directed Energy
 - Educational Outreach/STEM



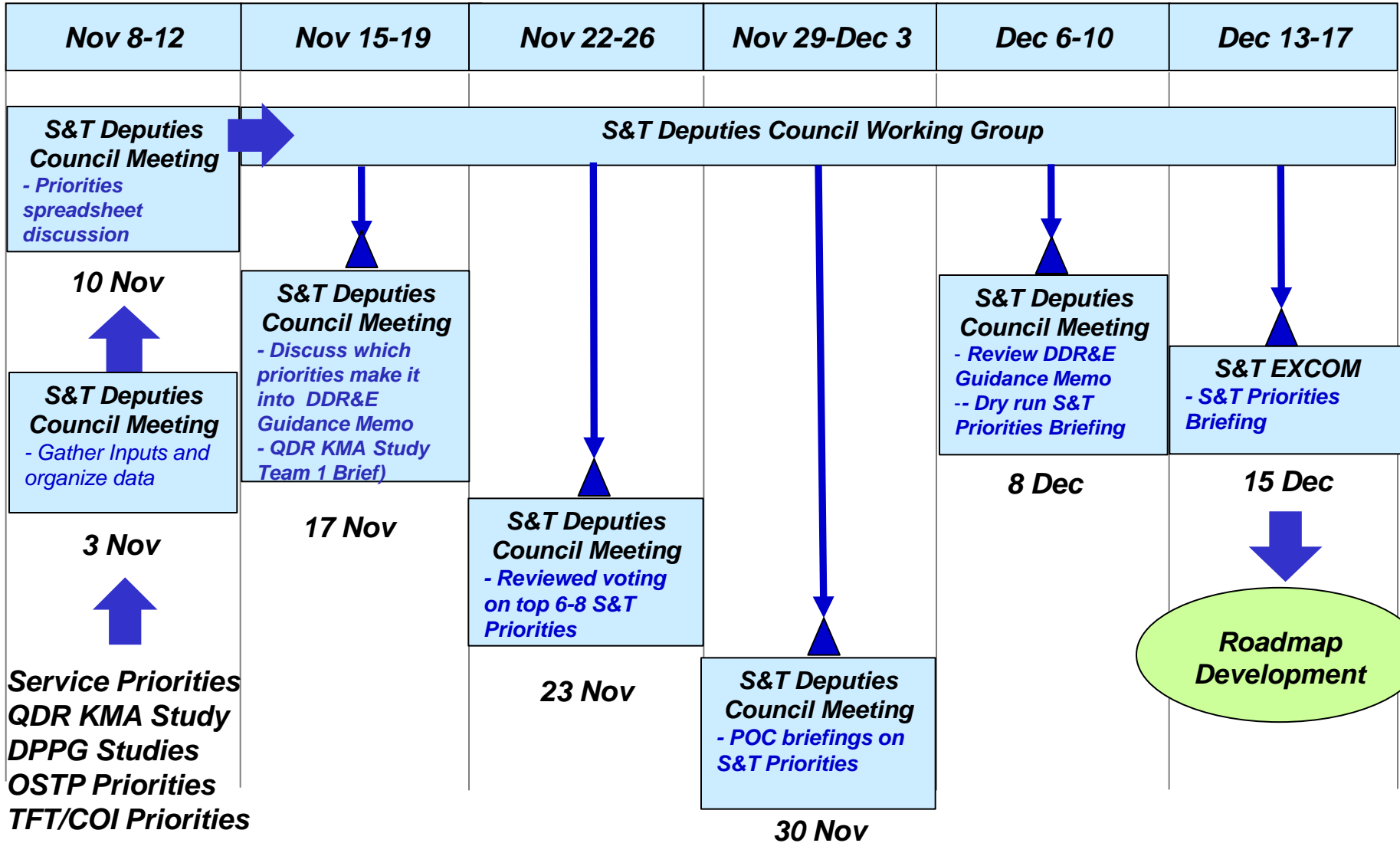
Initial S&T Priorities - 54 Total - Reduced to 7 (contd.) -



- **Service and Agency Priorities (contd.)**
 - Irregular Warfare/Counter IED
 - Undersea Warfare
 - Electronic Warfare/Electronic Protection
 - Improved Situation Awareness, Persistent ISR
 - Climate Change and the Arctic
 - Long-Range Strike
 - Medical PTSD/TBI, Blast/Trauma
 - Enhanced Cognitive Performance
 - Software Assurance
 - Rare Earth Element Technologies
 - Small Engines/Alternate Propulsion
 - Military-Unique Fixed-Wing and Rotary-Wing Technologies
 - Human System
 - Affordable Space Access
 - Precision lethality
 - Counter-WMD Technologies (9 total that were consolidated to 1)



FY 2013 S&T Priorities Timeline





Secretary of Defense S&T Priorities Memo – Apr 19, 2011



The Assistant Secretary of Defense for Research and Engineering, with the Department's S&T Executive Committee and other stakeholders, will oversee the development of implementation roadmaps for each priority area. These roadmaps will coordinate Component investments in the priority areas to accelerate the development and delivery of capabilities consistent with these priorities.

S&T Priorities

- **Data-to-Decisions**
- **Engineered Resilient Systems**
- **Cyber Science and Technology**
- **Electronic Warfare / Electronic Protection**
- **Counter Weapons of Mass Destruction**
- **Autonomy**
- **Human Systems**



SECRETARY OF DEFENSE
1200 DEFENSE PENTAGON
WASHINGTON, DC 20301-1000

APR 19 2011

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARY OF DEFENSE FOR ACQUISITION,
TECHNOLOGY AND LOGISTICS
ASSISTANT SECRETARY OF DEFENSE FOR RESEARCH
AND ENGINEERING
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Science and Technology (S&T) Priorities for Fiscal Years 2013-17 Planning

The Department's S&T leadership, led by the Assistant Secretary of Defense for Research and Engineering, in close coordination with leadership from the Under Secretary of Defense for Policy, the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense, the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy, and the Joint Staff, has identified seven strategic investment priorities. These S&T priorities derive from a comprehensive analysis of recommendations resulting from the Quadrennial Defense Review mission architecture studies directed in the FY 12-16 Defense Planning Programming Guidance.

The priority S&T investment areas in the FY13-17 Program Objective Memorandum are:

- (1) **Data to Decisions** – science and applications to reduce the cycle time and manpower requirements for analysis and use of large data sets.
- (2) **Engineered Resilient Systems** – engineering concepts, science, and design tools to protect against malicious compromise of weapon systems and to develop agile manufacturing for tested and tested defense systems.
- (3) **Cyber Science and Technology** – science and technology for efficient, effective cyber capabilities across the spectrum of joint operations.
- (4) **Electronic Warfare / Electronic Protection** – new concepts and technology to protect systems and extend capabilities across the electromagnetic spectrum.
- (5) **Counter Weapons of Mass Destruction (CWMD)** – advances in DoD's ability to locate, secure, monitor, tag, track, identify, eliminate and attribute CWMD weapons and materials.
- (6) **Autonomy** – science and technology to achieve autonomous systems that reliably and safely accomplish complex tasks, in all environments.
- (7) **Human Systems** – science and technology to enhance human-machine interfaces to increase productivity and effectiveness across a broad range of missions.



“The Assistant Secretary of Defense for Research and Engineering, with the Department’s S&T Executive Committee and other stakeholders, will oversee the development of implementation roadmaps for each priority. These roadmaps will coordinate Component investments in the priority areas to accelerate the development and delivery of capabilities consistent with these priorities.”



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 electro-magnetic 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.