

Office of Naval Research



Naval Future S&T Challenges Overview: S&T Program Influences, Priorities, and Program Rationale

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Director of Transition
18 April 2006**



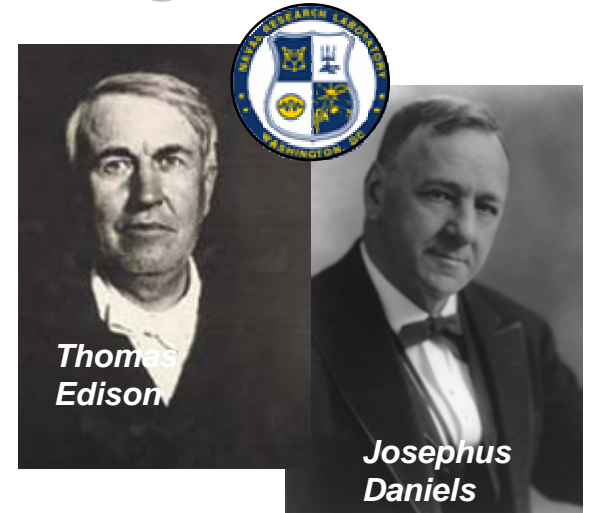
Presentation Agenda

- ONR and Its Mission
- Future Naval Capabilities Program
- Advanced Concepts Technology Demos
- Manufacturing Technology Program
- Small Business Innovative Research Program
- Technology Transition Initiatives
- Our Weblinks
- Questions?



Naval Research: An Enduring and Evolving Mission

Naval Research Laboratory (*Appropriations Act, 1916*): “[Conduct] exploratory and research work ... necessary... for the benefit of Government service, including the construction, equipment, and operation of a laboratory....”



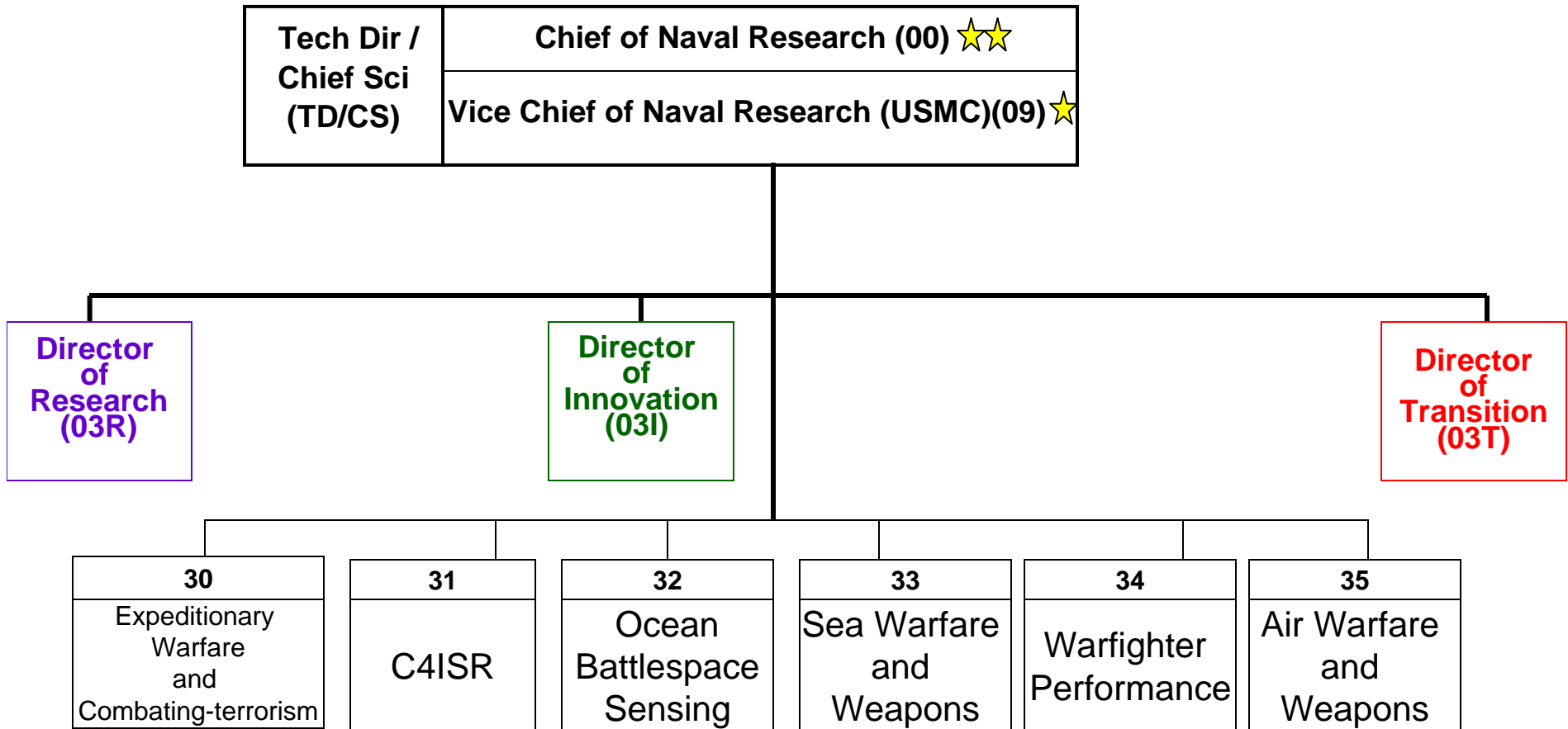
Office of Naval Research (*Public Law 588, 1946*): “... plan, foster, and encourage scientific research in recognition of its paramount importance as related to the maintenance of future naval power, and the preservation of national security.... ”



Transitioning S&T (*Defense Authorization Act, 2001*): “...manage the Navy’s basic, applied, and advanced research to foster transition from S&T to higher levels of research, development, test, and evaluation.”



S&T Directorate Organization





S & T Departments: Customers & Portfolios

EMW	FORCENet	SEA SHIELD	SEABASE	SEA WARRIOR	SEA STRIKE
MCLW MARCORSYSCOM MARFOR, NAVFAC NCIS, DTRA, DHS SOCOM SPECWARCOM JNLW Directorate Army Research Lab	SPAWAR NETWARCOM ONI NRO NSA CIA NAVSEA NAVAIR	FLT ASW COM N7C N096 NAVMETOC CORE NOPP NOAA UNOLS TFASW FASWC COMMINEWARCOM	NAVSEA NAVSURFOR NAVSUBFOR NAVAIRFOR (for ship systems) USCG DOE	Surgeon General Medical Officer of the USMC CNET CNP NIH	NAVAIR NAVAIRFOR Air Force Research Lab AMRDEC, Redstone AATD, FT Eustis NASA MCHQ AVN
DASN LMW	DASN IWS/LMW/ AIR/C4I	DASN LMW/ IWS/AIR	DASN SHIPS/LMW	DASN SHIPS/C41/ LMW	DASN SHIPS/ IWS/AIR
30 – Exp. Warfare & Combating Terrorism	31 – C4ISR	32 – Ocean Battlespace Sensing	33 – Sea Warfare and Weapons	34 – Warfighter Performance	35 – Air Warfare and Weapons
Exp. Man. Warfare USMC STOs in multiple warfighting areas – C4; ISR; Logistics; Human Perf, Trng & Surv; Maneuver MCM Warfare (w/32) Ground-based firepower Non-lethal weapons Combating terrorism Joint EOD Naval Specwar	Electronics Computer & Info Sciences Radar/EO/IR Maritime sensors EM propagation & interaction Signal & image processing C3 Networking Surveillance EW Navig/Timekeeping	Oceanography Ocean Acoustics Coastal Geosciences Marine Geology & Geophysics Marine metrology Space MCM (w/30) ASW (w/33,31) Signal Processing Maritime Sensing ASW & UUV's (w/33) Ocean eng. & marine systems	Chemistry Power & energy conversion Naval materials Non-linear dynamics Ship Structures Ship HM&E ASW & UUV's (w/32)	Cognitive science Neural science Behavioral science Social org./science Manpower, personnel & training Human factors Medical science Bimolecular science Biosystems Biomaterials CBWD	Physics Aerospace materials Energetics Surface & Air launched weapons Kinetic & Directed energy weapons Robotics UAV's Air Vehicles



DON FY06 S&T Portfolio (FY06 - \$1,776M)

<p>Acquisition Enablers (\$551M – 31%)</p> <ul style="list-style-type: none"> • FNC's (TOG Oversight) • Warfighter Protect • Capable Manpower (N1/N00T) • LO/CLO (PMR 51) 	<p>Discovery & Invention (\$713M - 40%)</p> <ul style="list-style-type: none"> • Naval scientific disciplines • NRL/Warfare Centers • National Naval Responsibilities • Technical workforce sustainment • High impacts/surprises
<p>Directed/Passthrough (\$330M – 19%)</p> <ul style="list-style-type: none"> • JFCOM's Joint Experimentation • POM-04 PDM (except EM Rail Gun) • PBD's and earmarks 	<p>Leap-ahead Innovations (\$182M -10%)</p> <ul style="list-style-type: none"> • Innovative Naval Prototypes • SwampWorks • Tech Solutions • SEA TRIAL • Fleet/Force Response Programs

ONR manages an additional \$400M of non-S&T funds and approximately \$500M of Congressional Adds.



Future Naval Capability Program

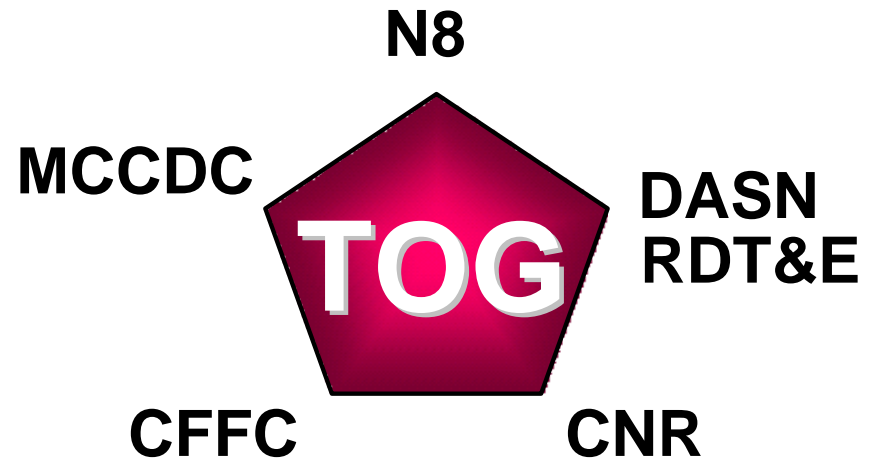
The FNC program is composed of **Enabling Capabilities** (ECs) which develop and **deliver quantifiable products** (i.e., prototype systems, knowledge products, and technology improvements) for insertion **into acquisition programs** of record after meeting agreed upon exit criteria **within five years**.

- The ECs are currently aligned with four of the pillars of Naval Power 21, a vision for the U.S. Navy and Marine Corps of the future (Sea Shield, Sea Strike, Sea Base, and FORCEnet) with an additional group for crosscutting technology improvements (Enterprise and Platform Enablers) for operations and maintenance cost savings.

FNC Oversight Process

The Technology Oversight Group (TOG) provides oversight for key milestones:

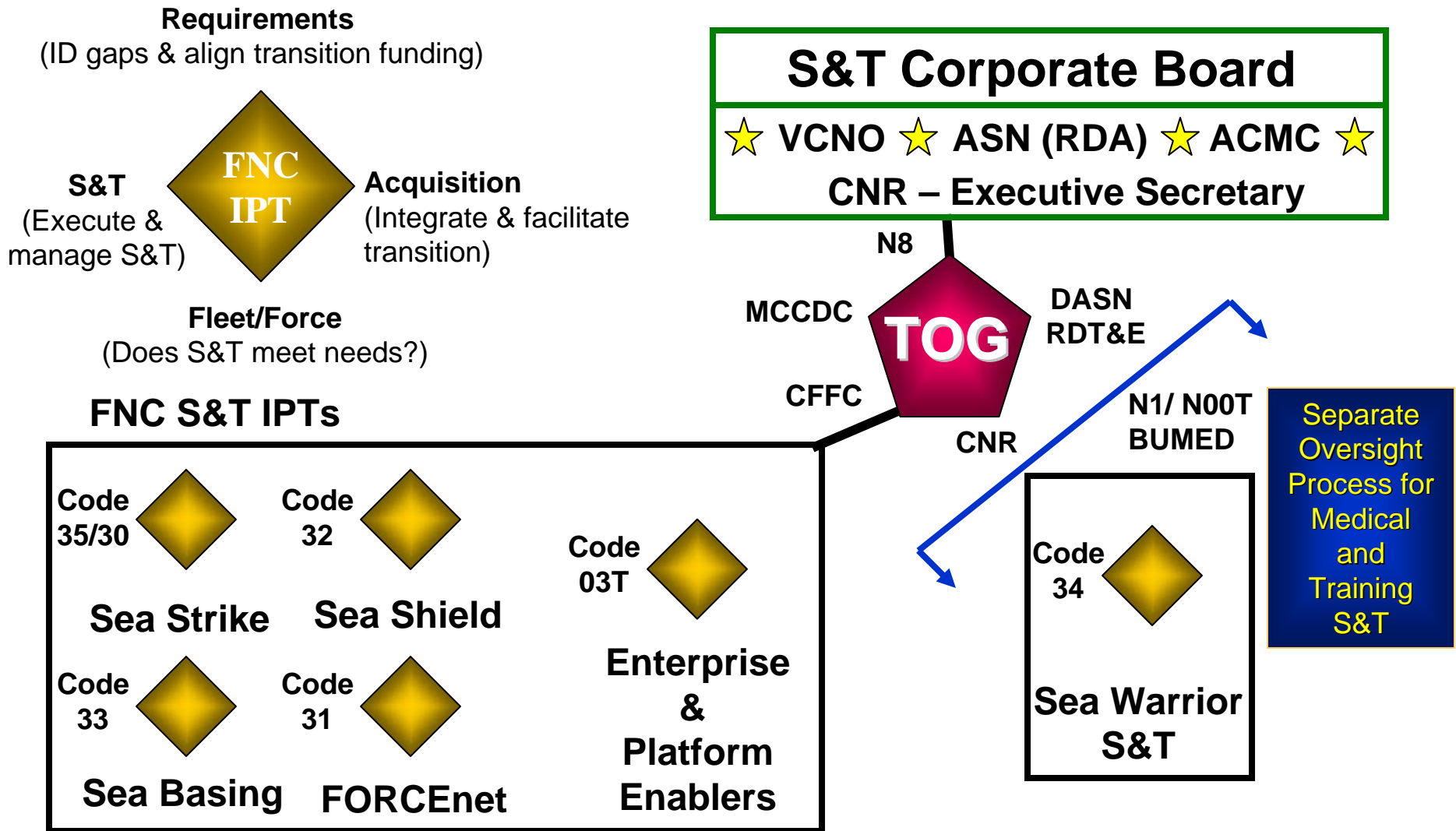
- NCDP Gap analysis and prioritization
- ONR development of new start EC proposals
- IPT and TOG WG assessment of proposed new start ECs
 - Competitive process based on gap priorities
 - Many proposals go unfunded
- TOG review and approval of new start ECs
- N6/N7 and N091 budget submissions
- IPT transition status reports to CNR for ongoing ECs
- CNR status report to the TOG for ongoing ECs
- CNR annual review of on-going ECs



Voting Members

N8, MCCDC	(Co-Chairs, Requirements)
N091/CNR	Resources/S&T
DASN, RDT&E	Acquisition
CFFC	Fleet/Force

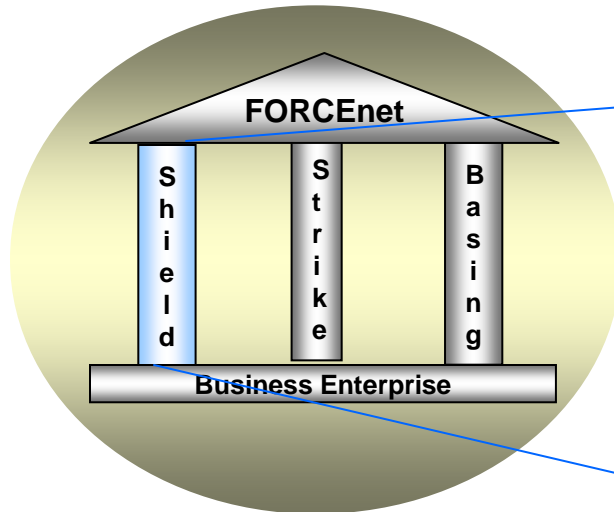
FNC IPT Structure



IPTs Achieve Stakeholder Consensus

Sea Shield

Ensuring Maritime Dominance but Taking Measured Risks



Ensuring Strategic Resources Flow

Building Regional Confidence



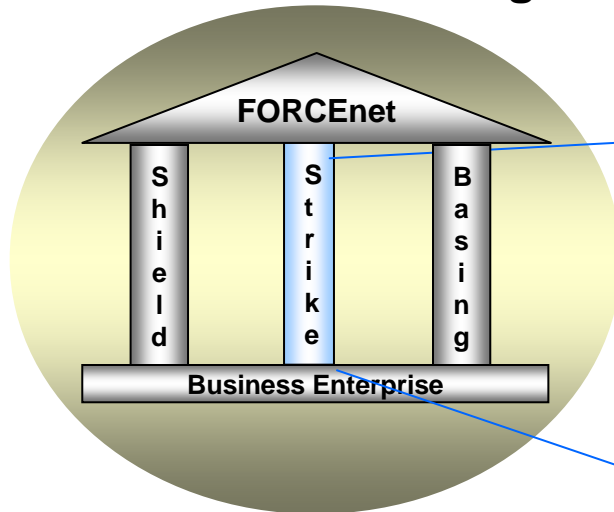
S&T Gaps

- Shipboard force protection against asymmetric threats
- Capacity to clear large areas of mines without cued ISR
- Rapid submarine cueing, detection and localization in shallow to deep water
- Sea-based missile defense of ships & littoral forces
- Platform defense against undersea threats, including ship self-defense against multi-salvo torpedo attacks
- Destruction of mines in areas through which Marine Corps and joint forces must maneuver, ranging from deep water through the objective
- Adequate detection and engagement of terrorist and Special Operations Force threats to ship inport and transiting restricted maneuverable choke points

Project Global Defensive Assurance

Sea Strike

Ensuring Maritime Dominance but Taking Measured Risks



*Naval and
Air Strength*



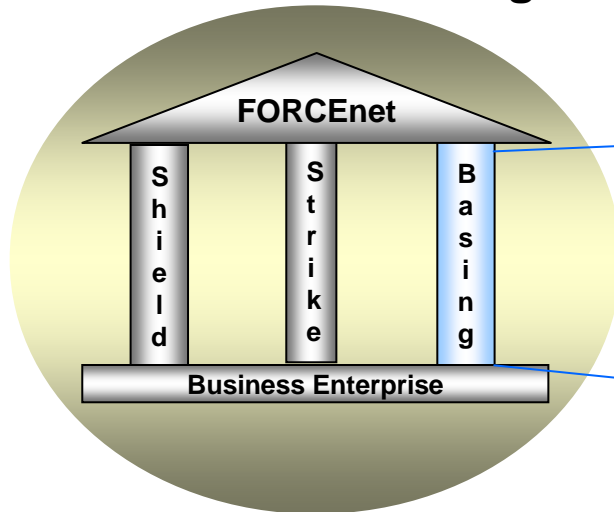
S&T Gaps

- Urban/Littoral Operations
- Rapid movement of mobile/emergent target data to shooters
- Survivability of aircraft operating at low altitudes
- Persistent high speed strike weapon to engage time critical targets
- Weapons with standoff and fire and forget capability against moving targets
- Common and persistent maritime picture on/below the surface
- Naval fires to support speed/depth of Marine Corps and joint maneuver

Project Precise and Persistent Offensive Power

Sea Basing

Ensuring Maritime Dominance but Taking Measured Risks



*Right Capabilities
for the Right Price*

S&T Gaps

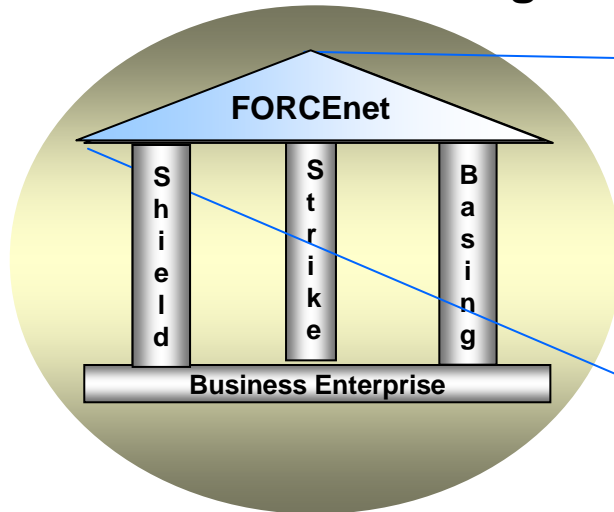
- Rapid closure and sea based operations of ground forces
- Tactical lift platforms for ship-to-objective maneuver from "beyond horizon"
- Aviation capacity on the sea base to conduct MEB level and special operating forces operations
- Connectors and interfaces to support the transport of personnel, equipment and logistics to/from the base and to/from objective



Project Joint Operational Independence

FORCEnet

Ensuring Maritime Dominance but Taking Measured Risks



Ensuring Strategic Resources Flow

Building Regional Confidence



S&T Gaps

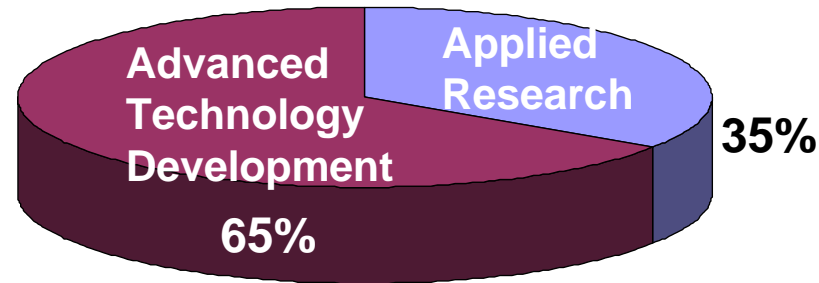
- Urban/Littoral Awareness
- Maritime domain awareness, homeland defense and interdiction of terrorist threats
- Joint combat ID
- Persistent ISRT for accurate target discrimination and location
- Computer network defense and information assurance
- Information operations
- Ubiquitous, secure communications and network infrastructure

Projecting a networked and distributed combat force

FNC Investment

Investment by Research Type

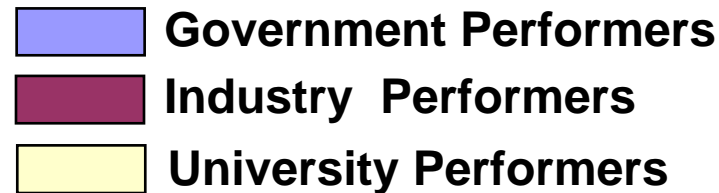
6.3



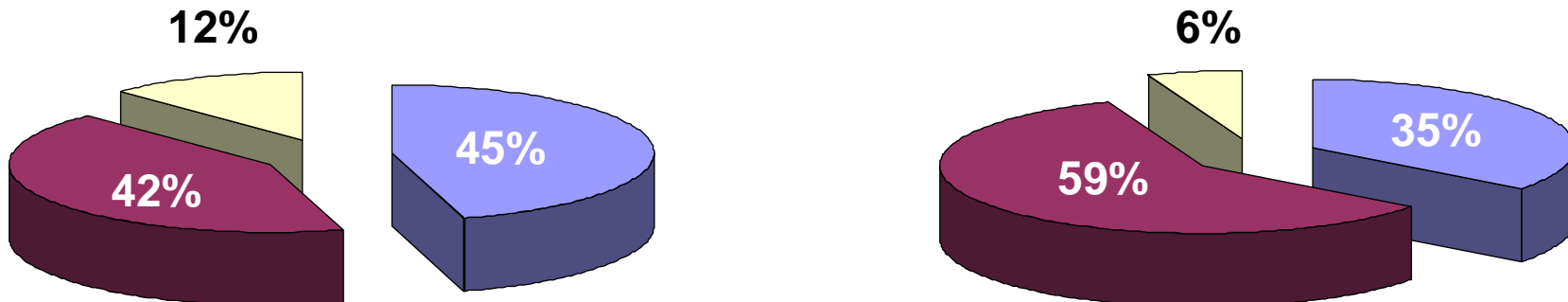
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Investment by Performer

6.2



6.3



- FNCs leverage technologies that can be matured over the FYDP.
- FNCs are delivery oriented.

Transition Commitment Level

Transition Commitment Level (TCL)					
Years remaining in approved S&T development program	1	2	3	4	5+
Strength of Transition Commitment					
A TTA Level A - Committed Fully executed final TTA. Including integration strategy. Transition funding programmed.	A1	A2	A3	A4	A5
B TTA Level B - Working Detailed Exit Criteria. Acquisition Program Interested. Transition TRL established. Proposed Transition Budget, PE Line identified/targeted	B1	B2	B3	B4	B5
C TTA Level C - Initial Initial Exit Criteria. Target Acquisition Program Identified and Program Manager is watching with interest as technology is developed. PE Line identified/targeted. Key stakeholders identified	C1	C2	C3	C4	C5
D No TTA IPT and TOG commitment.	D1	D2	D3	D4	D5



Annual ONR FNC Schedule

- **Mid Aug** IPT Transition Assessments Due
- **End Aug** Proposed New EC Proposal Abstracts Due
- **Sept** Proposed New ECs Selected for Internal Review
- **Sept** TOG Review of CNR Transition Status Report
- **Oct –Nov** Internal Review of Proposed New ECs
- **30 Nov** ONR Endorsed Proposed New ECs to TOG WG
- **Dec – Mid Jan** IPT Reviews of Proposed New ECs
- **Jan – Mar** Release of BAAs/RFPs for New FY Contract Starts
- **End Jan – Mid Feb** TOG WG Review of Proposed New ECs
- **Mid Feb** CNR Review of ECs in Execution
- **Feb** Proposed New EC Budget Balancing
- **Early Mar** TOG Decision Meeting on New Start ECs
- **Apr** FNC Budget Current POM Submission
- **July** New EC Briefs to the R&D Partnership Conference
- **July** EC Business Plan Updates Due
- **Oct – Dec** Initiation of New FY Contracts

Red denotes New
Blue denotes Approved
Green denotes Executing/On-going

ACTDs

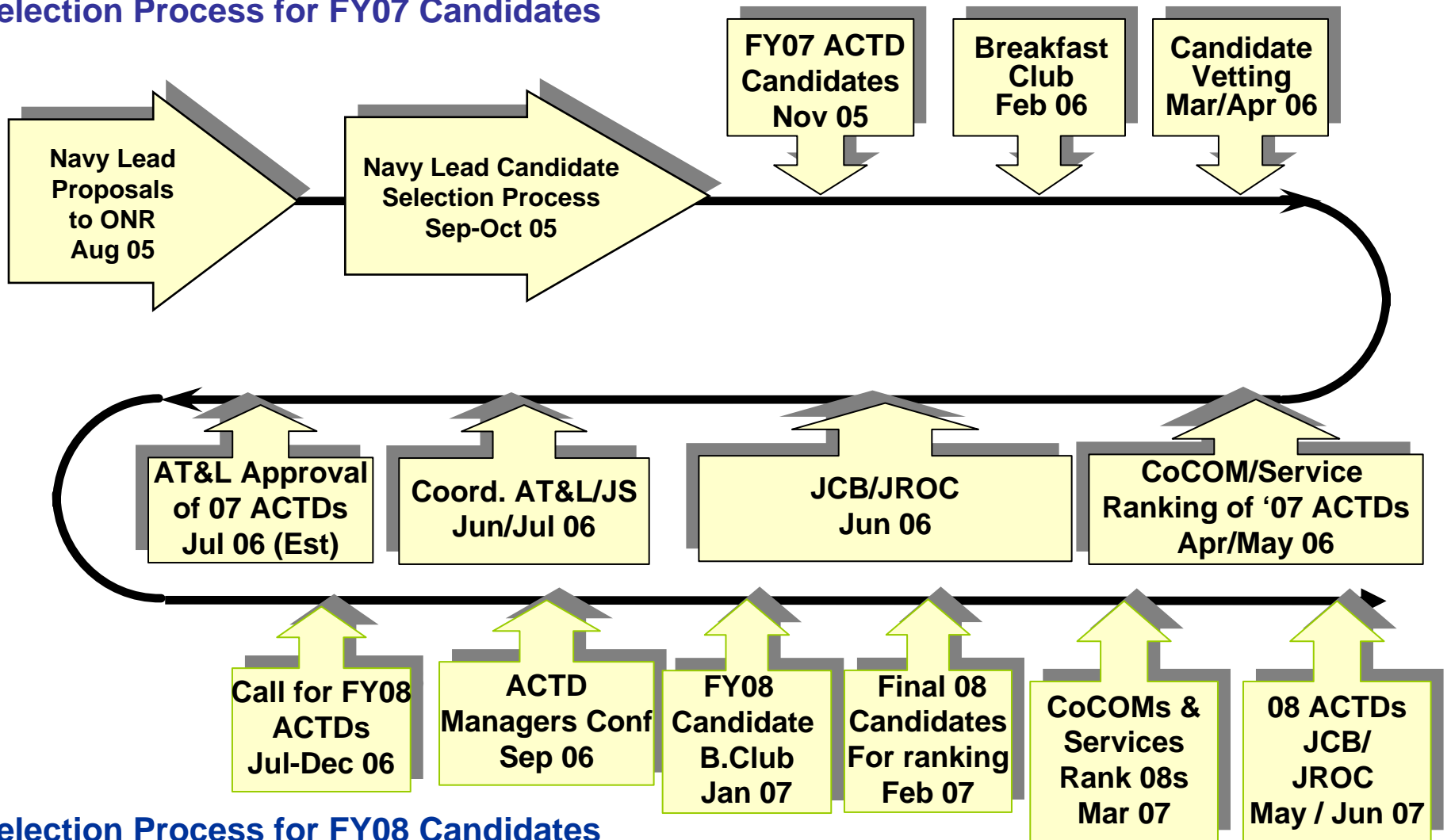
Advanced Concept Technology Demonstrations (ACTDs) exploit mature and maturing technologies to solve important military problems.

The Navy Led ACTD program is a structured process established to assure that proposals submitted to OSD transition successfully to a Program of Record. The successful ACTD will:

- Address a **joint warfighting** need with a **mature technology (TRL 5+)**
 - **Joint**, often includes coalition partners and other U.S. Government
- Have Multiple Funding Sources - OSD routinely provides **10-30%** funding
- Be Managed by an **integrated team**
 - Lead Service/Agency: Transition Manager
 - Developer Service /Agency: Technical Manager
 - Sponsoring Combatant Commander: Operational Manager
- Provide a technical solution with demonstrated **CONOPS**
- Evaluate solutions in field demonstrations by warfighters
- **Is Rapid**: 1-3 Years – or less - to Final Demonstration/Prototype
- Leaves residuals with warfighter with 2 years support

DUSD AS&C ACTD Program Timeline

Selection Process for FY07 Candidates

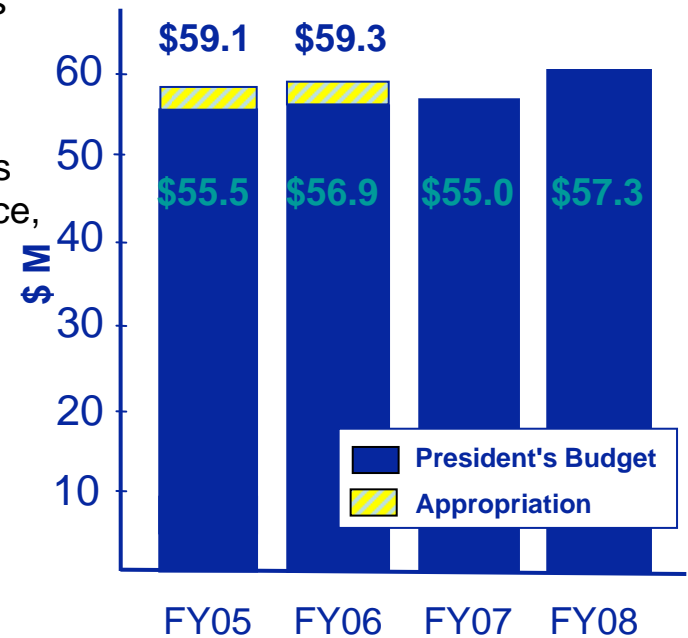


JCTD Timeline TBD



Navy ManTech Program Mission, Budget, and Roles

- Mission:
 - Develop enabling manufacturing technology -- new processes and equipment -- for implementation on DoD weapon system production lines
 - DoD 4200.15 states investments should:
 - Transition emerging S&T results to acquisition programs
 - Improve industrial capabilities in production, maintenance, repair and industrial base responsiveness
 - Advance manufacturing technology to reduce cost, improve performance, and responsiveness
- Budget:
 - Stable at approx. \$60M
- Execution:
 - Nine Centers of Excellence (COEs)
 - 8 Contracted
 - 1 Government
- ONR Roles:
 - Budgeting
 - Investment Strategy – platforms for investment
 - Program Planning
 - Contracting – COEs (competed every 5 years) and projects
 - Program Execution
 - Technology Transfer



FY06 Investment Strategy

Platform-Centric Focused Initiatives

Primary investment strategy supports key naval assets

Primary Emphasis



PEO (Ships)
DD(X) Family



PEO (Carriers)
CVN 21



PEO (Ships)
LCS



PEO (Ships)
LPD 17
DDG 51



PEO (T)
F-18 Family
EA-18G



PEO (IWS)
Missiles
Weapons
Munitions



PEO (Subs)
SSN
SSGN



SBIR Congressional Program

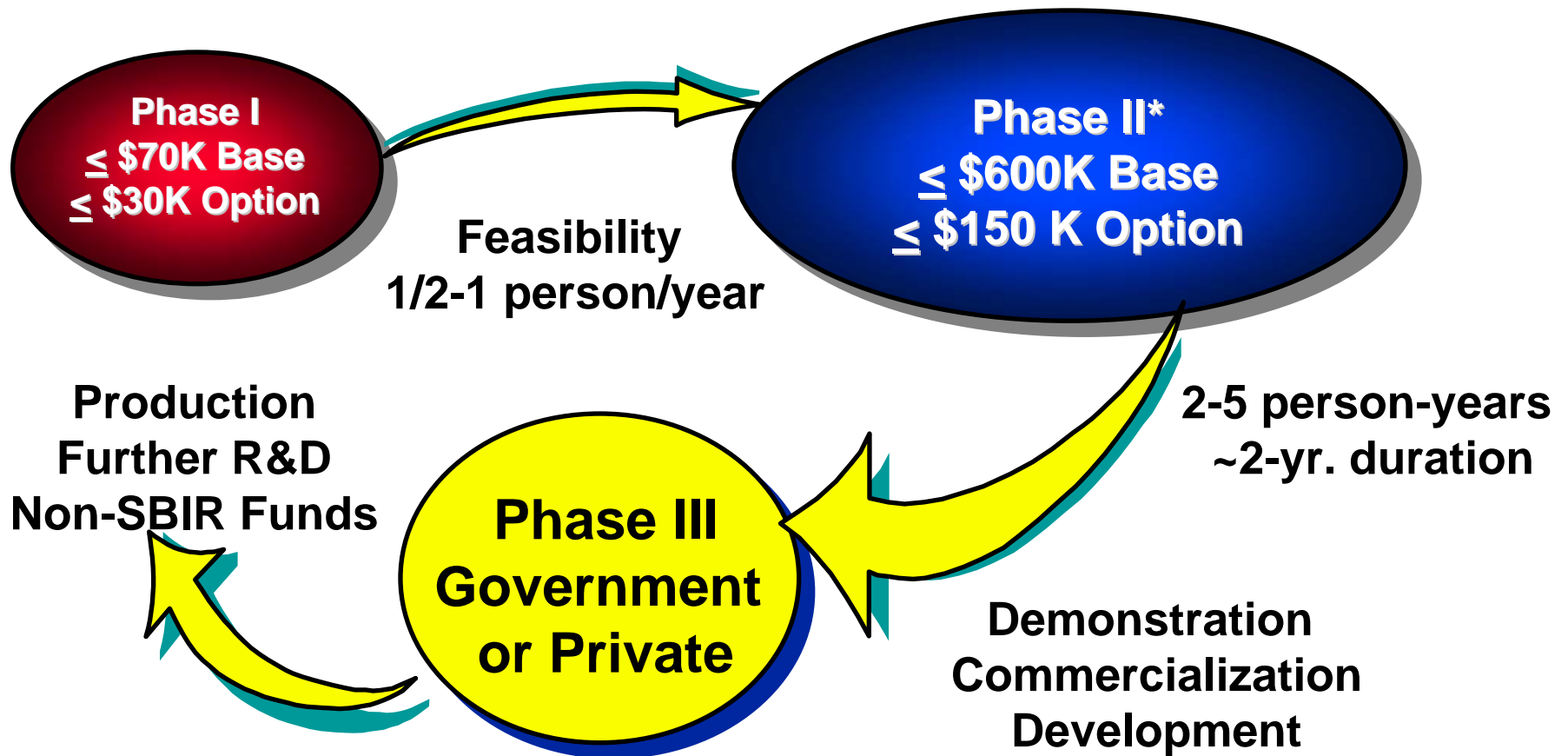
Goals

15 USC 638 SBIR Reauthorization, December 2000

- 1) Use small business to meet federal R/R&D needs.
- 2) Stimulate technological innovation.
- 3) Foster and encourage participation by socially and economically disadvantaged SBCs, and by SBCs that are 51 % women -owned & controlled, in technological innovation; and
- 4) Increase private sector **commercialization** of innovations derived from federal R/R&D, thereby increasing competition, productivity and economic growth.

What is meant by “commercialization”?

Program Phases



*varies by component



Technology Transition Programs

Program	Purpose
Defense Acquisition Challenge Program (DACP)	Identify and introduce innovative and cost-saving technology or products from within DOD's science and technology community as well as externally into existing DOD acquisition programs.
Technology Transition Initiative (TTI)	Facilitate the rapid transition of new technologies from DOD science and technology programs (TTI).
Quick Reaction Fund (QRF)	Identify and rapidly field-test promising new technologies from DOD's budget execution years.
Rapid Technology Transition (RTT)	Rapidly transition technology from any source into Department of Navy (DoN) programs of record (PoRs) to meet emergent/urgent Naval Needs.
Domestic Technology Transfer	Mandate by Federal Technology Transfer Act of 1986 to effectively use national S&T to benefit the public and private sector.



Characteristics of Transition Programs

Transition Program	Scope	Duration	Funding	TRL Level 1-9	Topic Call
DACP	Any person or activity inside or outside DoD	1 to 3 years	Up to \$2M	6	Annually
TTI	DoD S&T Programs	1 to 4 years	Up to \$3M	6-7	Annually
QRF	Any S&T Programs	6 to 12 months	Up to \$3M	6-7	Annually
RTT	Any person or activity inside or outside DoD	2 years	Up to \$2M	6-9	Sep/Mar
Domestic T2	Congressionally mandated by Federal Technology Transfer Act of 1986	Ongoing	None		



Office of Transition Program Website Links

Office of Naval Research

www.onr.navy.mil

Future Naval Capabilities

http://www.onr.navy.mil/sci_tech/3t/fnc/

Advanced Concept Technology Demonstrations

<http://www.onr.navy.mil/actd>

Manufacturing Technology

http://www.onr.navy.mil/sci_tech/3t/mantech/

Small Business Innovation Research

http://www.onr.navy.mil/sci_tech/3t/sbir_sttr/

Transition Initiatives

http://www.onr.navy.mil/sci_tech/3t/transition/



Questions