



How to Transition to the Commercial Sector

6th Annual National Small Business Conference
“Pathways to Success”

June 3, 2009

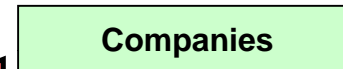
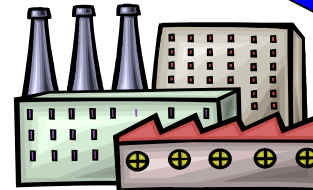
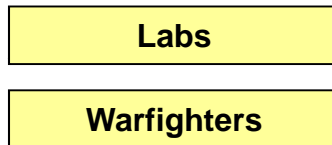
**Cynthia E. Gonsalves, Deputy Director
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Office of the Deputy Under Secretary of Defense
(Advanced Systems & Concepts)**

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DoD



Technology Transfer

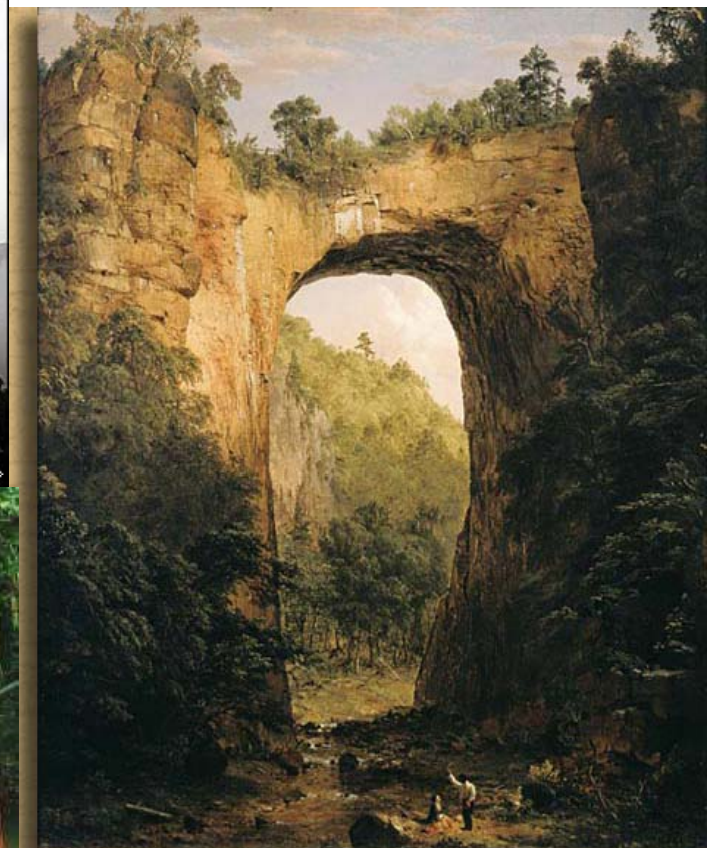
Technology Transition

Based on:

15 USC 3710-15, Technology Innovation

10 USC 2515, Office of Technology Transition

10 USC 2359a, Technology Transition Initiative



Courtesy, Bayley Art Museum, University of Virginia, Charlottesville

The Transition Lexicon

- **Technology Transition**: Range of activities involved with improving, moving, maturing, & speeding technology to the marketplace
 - In DoD, this usually applies to developing, adapting, or improving commercial **and** military technologies for use in weapon system applications. For example, monitoring technology movement to:
 - ✓ the next phase of acquisition; OR
 - ✓ an actual military system that has been or may be fielded; OR
 - ✓ a military / commercial test facility or depot
- **Technology Insertion**: Introduction, placement, and integration of a demonstrated defense or commercial technology into a military system, component, or application
- **Technology Transfer**: Process of sharing, transmitting, or conveying technology data and information (intellectual property) between the government agencies, industry, and academia
- **Affordability**: Consideration of “best value” options that integrates performance, cost, producibility / manufacturability, reliability, supportability, and risk
 - Does not mean the “cheapest”

Technology Readiness Levels (TRLs)

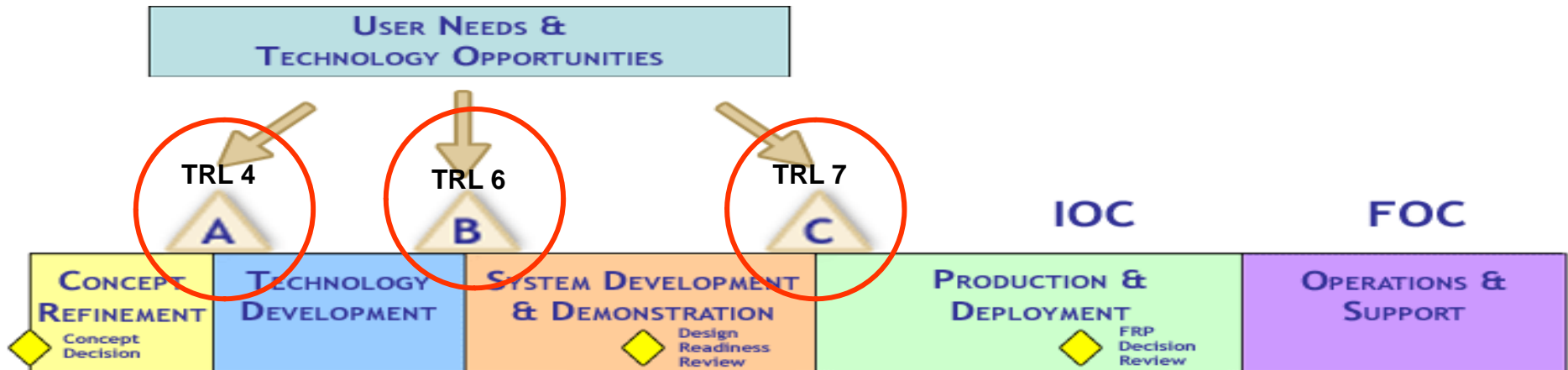
Technology Readiness Assessments (TRAs)

TRLs: A scale that describes the maturity of a technology with respect to a particular use

Scale from 1
(least mature) to
9 (most mature)

- TRL 1 = “an idea”
- TRL 4 = “a lab experiment”
- TRL 6 = “a prototype ready for initial integration”
- TRL 7 = “ready for final operational testing”
- TRL 9 = “fielded and used as intended”

- **Primary Purpose:** To help make decisions concerning the development and transition of technology. **Uses:**
 - Provides a common understanding of technology status (maturity)
 - A factor in technical risk management
 - To help with: Transition of technology, funding, scoping acquisition programs
- **DoD requires all programs to conduct a TRA before commencing System Design and Development (that is, at Milestone B)**



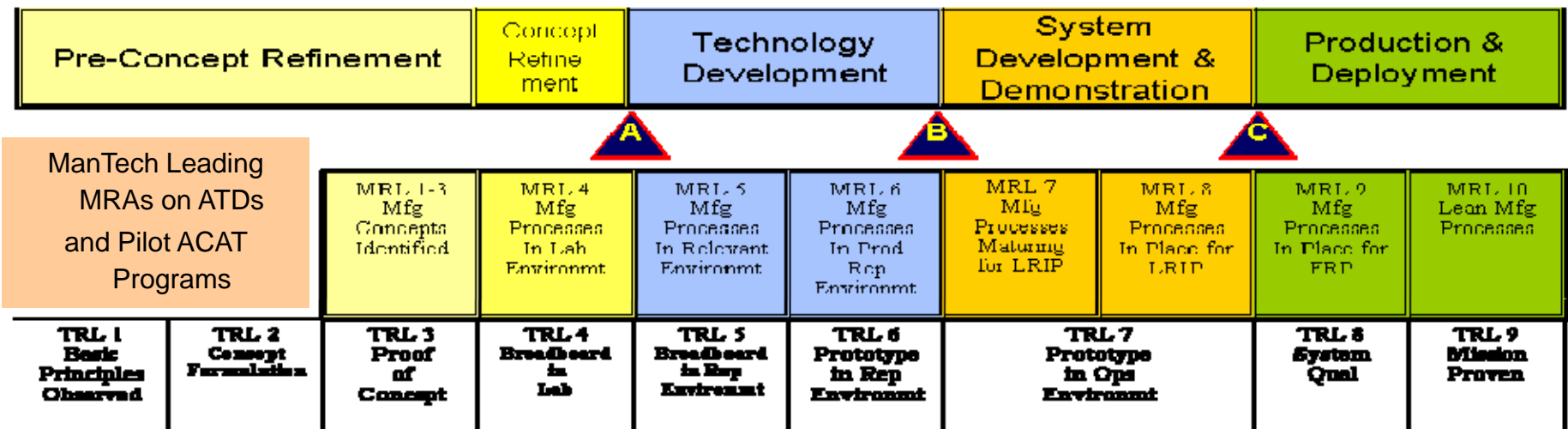
Manufacturing Readiness Levels (MRLs) & Manufacturing Readiness Assessments (MRAs)

Immature Technology & Unstable Manufacturing Processes

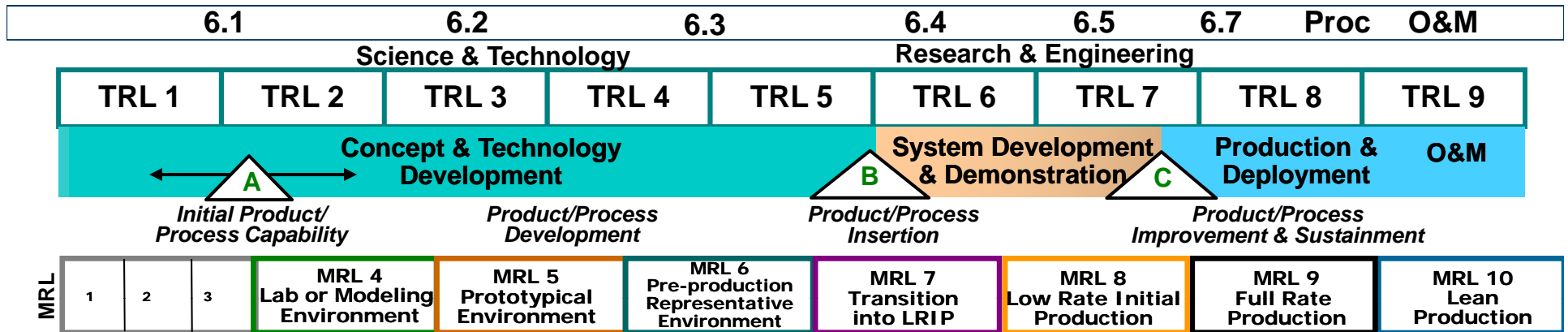
- GAO study of 26 programs: RDT&E costs up by 42% with schedule slippage of 20%

Manufacturing Readiness Levels (MRL) Developed

- In collaboration with industry
- Common Standard and framework for identifying, communicating, and managing manufacturing risks
- Reconciled with TRLs
- Establish and promote manufacturing risk management as basic principal of technology development and acquisition programs



Advanced Systems & Concepts Portfolio



COCOM /Joint/Coalition focused

Joint Capability Technology Demonstrations

Demo 1-3 yrs

AC/JCTDs Transition Enabler – “joint peculiar” capabilities

JCTD Transition & DAE Pilot Program

Industry “On” Ramp – Test to Procure Tech Refresh

Defense Acquisition Challenge

Service, SOCOM Nominated - Test to Procure

Foreign Comparative Testing

DOD S&T Push

Tech Transition Initiative

DoD Technology Transfer

Formerly TechLink

to Private Sector

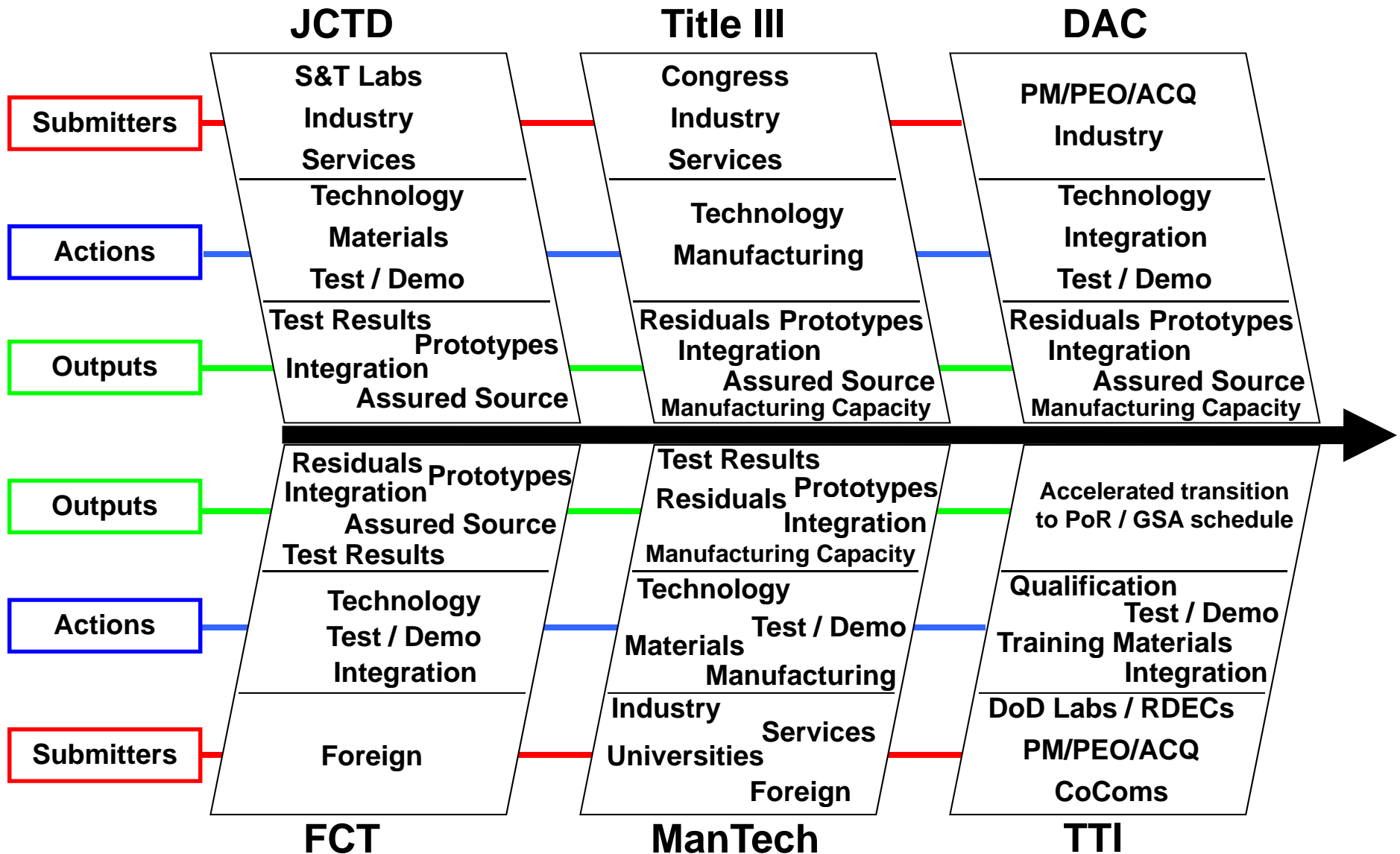
Domestic Technologies Critical to National Security

Defense Production Act (Title III)

ManTech Joint Investments

Defense Manufacturing Technology – Next-Gen Multi-Service Enablers

Transition Programs



OUTCOME: BETTER, FASTER, CHEAPER DEPLOYMENT TO THE FIELD

TECHNOLOGY TRANSITION

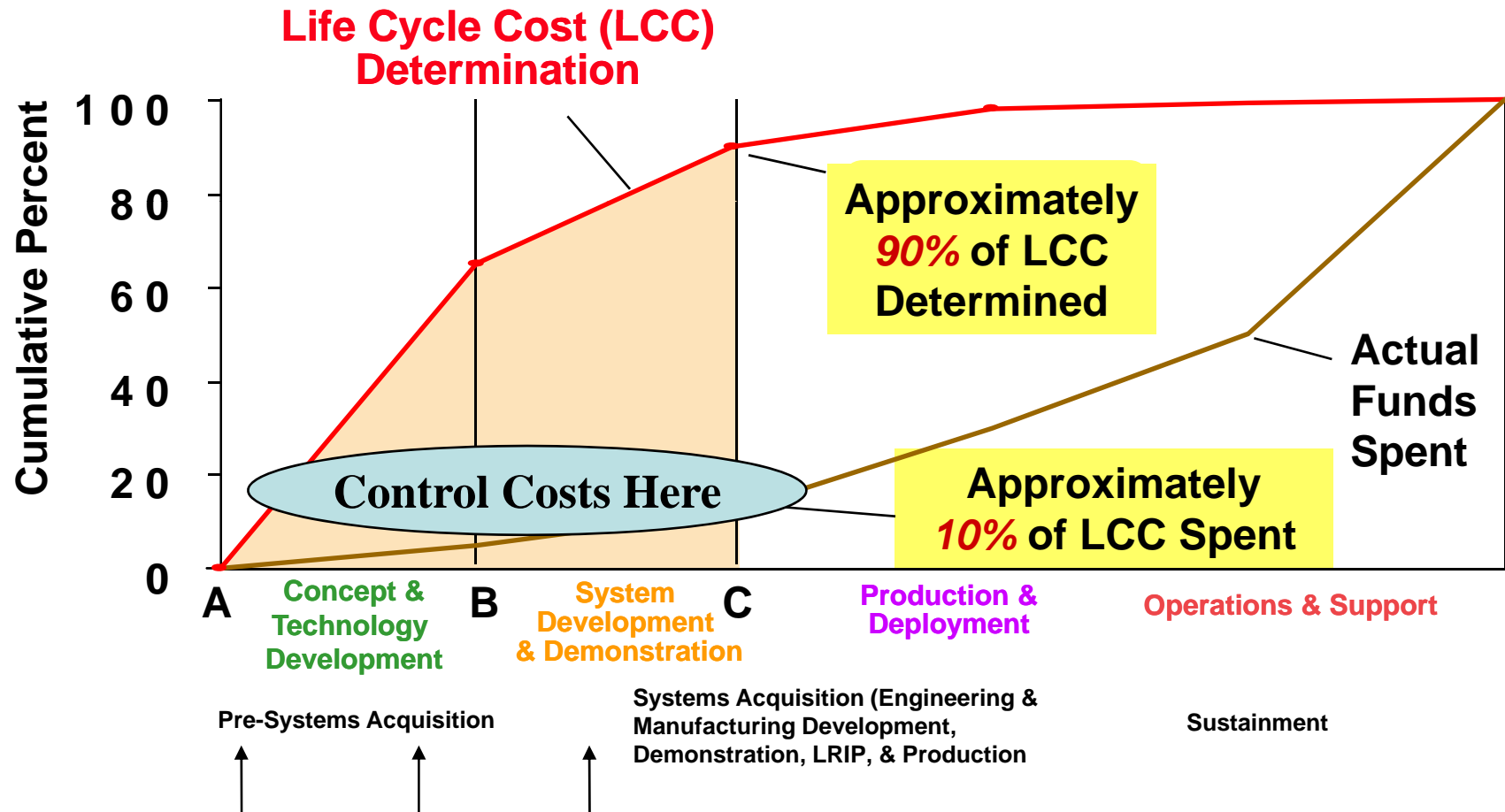
What is the intent?

- Moved into an acquisition program of record
- Can be acquired/procured through normal DoD procurement (i.e., GSA schedule)
- Has addressed DOTMLPF satisfactorily
- Provides sustainable capability

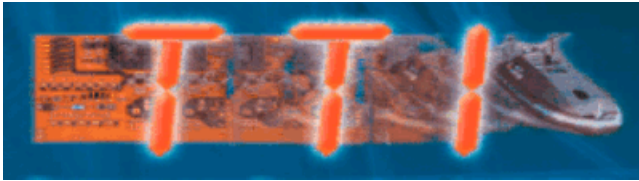
Baseline Product/Technology no longer funded by S&T program.

The Need to Transition Technology Early

Acquisition Community is Focused on Cost Reduction Throughout Life Cycle



S&T: Technology Opportunities & User Needs



Technology Transition Initiative

- **Congressional Language:**
 - Facilitate the rapid transition of new technologies **from S&T into acquisition programs** of the Department for the production of such technologies.
- **Objectives:**
 - Accelerate the introduction of new technologies into operational capabilities for the armed forces.
 - Successfully demonstrate new technologies in relevant environments.

Weighted Criteria

- TTI Funding Accelerates Product Transition*
- Project is from DoD S&T Base *
- Cost Sharing to leverage funding*
- Less than 4 years TTI Funding*
- Established exit criteria
- Joint Focus
- Value to the Warfighter
- Technology mature – TRL 6 or 7
- Commitment to Acquisition/Procurement Path



MCM USSV



JSGPM (M50)
with ESLs



Husky Mounted
Detection System



Sense & Avoid for
Small UAS

Technology Transition Agreements

- All TTI projects required TTA prior to release of funding
- Signed by S&T and Acquisition leaders in executing organizations and Director, OTT
- Template/guide provided in proposal preparation instructions
- Documents **commitment** to transition, transition plan details, resources required, **exit criteria**

TTAs are required for ALL TTI projects.

Examples of TTI Projects

Unmanned Sea Surface Vehicle

- Mine warfare mission package for LCS
- Accelerates capability by 2 years

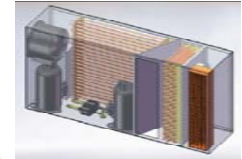


Image Compression for Digital Precision Strike

- High quality image transmission for SOF Mission Planning
- Accelerated delivery by 3 years

Sense and Avoid for Small UASs

- S&A for Army Shadow UAS
- Accelerates capability by 2 years



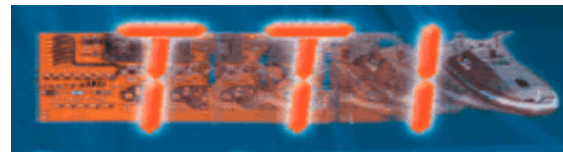
Tactical Idle Reduction

- Fuel savings for Army long-haul trucks
- Accelerates capability by 3 years



Electronic Image Intensifier for Apache Helicopters

- Fused imagery into single device for pilot
- Accelerates capability by 3 years



38 open projects

Defense Acquisition Challenge (DAC)

- ***Find & Test “Here & Now” Solutions***
 - Projects begin within a year, end within 2-3 years
 - Testing at U.S. or foreign ranges
 - Project value: Range of \$200K - \$2M; average of \$800K
- ***OSD Selects & Funds Projects***
 - Clear Goal: “Test to Procure”
- ***Services & SOCOM Execute Projects***
 - Nominate & prioritize their projects
 - PMs manage the tests

Fund Testing of World-Class Items that Solve Warfighter’s Problems

DAC – Testing Innovative Products for the Warfighter

The FY 2003 National Defense Authorization Act directed the Defense Acquisition Challenge Program to provide opportunity for:

- **“Increased introduction of innovative and cost-saving technologies into current acquisition programs of the DoD”**
- **“Any person or activity within or outside the DoD to**
 - ✓ **Propose alternatives, to be known as challenge proposals at the component, subsystem, or system level of an existing DoD acquisition program ...**
 - ✓ **that results in improvements in performance, affordability, manufacturability, or operational capability of that acquisition program”**
- **Focus on mature technologies ... TRL 7-8!**

DAC Impact

Examples of Warfighter Deployment (2003-2005 Testing)

Mini-Combat Trauma Patient Simulation System (Army & Medical Education Technologies, Inc)

- ✓ Realistic, virtual training provided for over 3500 medics
- ✓ Supports reduction of training attrition rate from 23% to 6%
- ✓ 14 simulators for Navy (Pendleton & Lejeune); 90 Army systems on contract
- ✓ Spiral in place to test follow-on tether-less Stand Alone Patient Simulator



Spray Cool™ for Counter Targeting System (INSCOM & Isothermal Systems Research Inc)

- ✓ Self-contained, hermetically-sealed housing that cools electronics
- ✓ Enables force protection against MANPADS & mortar attacks
- ✓ 5 systems deployed to OIF / won 2003 VE Achievement Award
- ✓ Facilitated risk reduction for follow-on technology (field programmable gate arrays)



Enhanced Position Location Reporting System (Navy / USMC & Northrop Grumman Info Technology)

- ✓ Quality of Service for the Systems Planning Engineering & Evaluation Device
- ✓ Increased communications through optimum battlefield positioning of assets
- ✓ Deployed to II Marine Expeditionary Force in Iraq



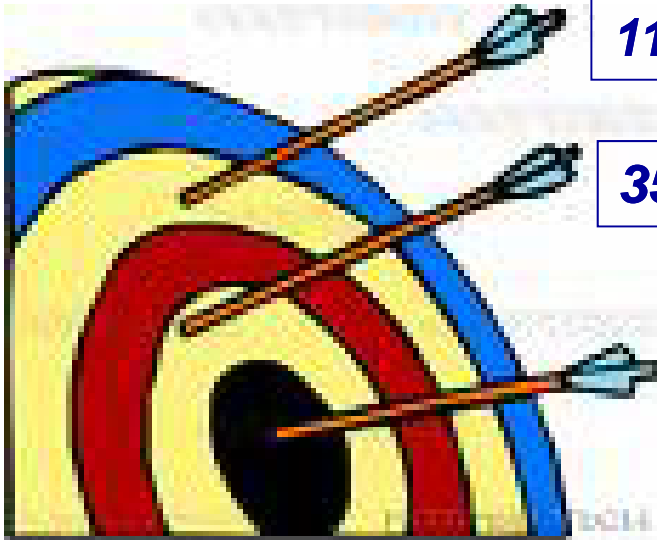
Lightweight Core Material for Blackhawk & Apache (Army & Aztex Inc)

- ✓ Composites for a lighter-weight aircraft structure
- ✓ Provides increased platform performance and range



DAC – Performance Measures

Program Level Metrics & Results (2003 - 2009, 7 Years)



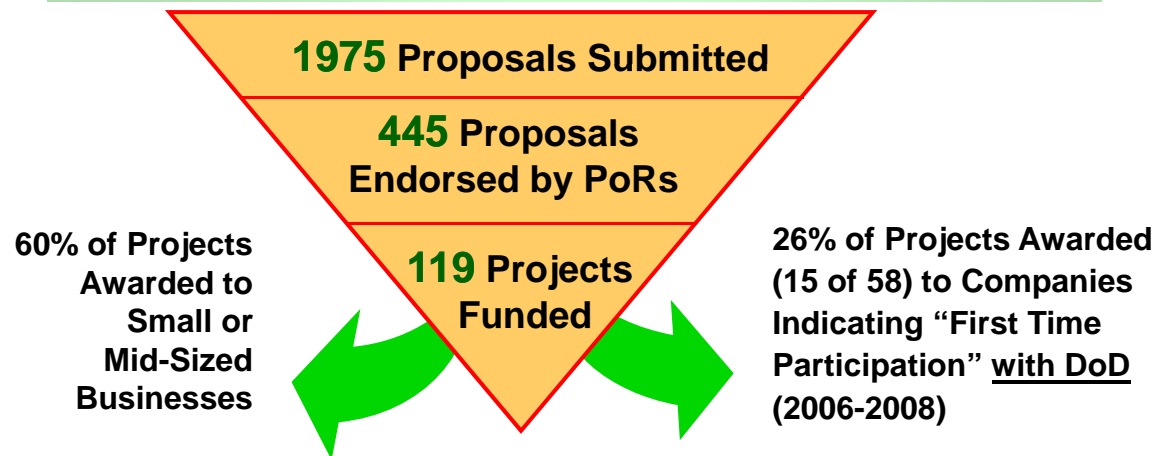
119 Projects Started - 60 Completed

35 Projects – Procurements Worth \$364M

30 Projects – Direct Support for Overseas Contingency Operations (OCO)

Competitive - Supports Highest Priority Warfighter Needs

- OSD Investment: \$196M (constant FY09 dollars)
- Avg. Return-on-Investment (ROI) - - 5:1
 - ✓ Based on procurement & life cycle cost avoidance
- Vendor Teaming with U.S. Industry in 35 States & D.C



Manufacturing Technology (ManTech)



- *ManTech is critical for moving **disruptive technologies** into **disruptive capabilities***
- *If you can't build **IT**, build **IT** affordably, reliably, and in a timely manner, you don't have **IT**.*
- *To have true capability, must be able to **move beyond the prototype "One-Off"***
- **Operates Under Title 10 (Section 2521)**
 - **Manufacturing process** investments that provide product performance, operational, & affordability improvements
- **All About Affordable & Timely Equipping of the Warfighter**
 - Defense essential needs **beyond normal risk** / interest of industry
 - **Pervasive needs** across systems, platforms, or components
- **Transition of Validated Technology**
 - Scale-up of processes for S&T, ATD, IR&D, & ACTD products
 - Focus: Manufacturing **process investments**

**ManTech Addresses Major QDR Issues – Affordability, Sustainability,
Decreased Logistical Footprint**

ManTech Recent Successes



Navy MT - Reduced VA Class Submarine Labor 85% for 1,000s of submarine attachments and penetrations – saving more than 8000 labor hrs per ship

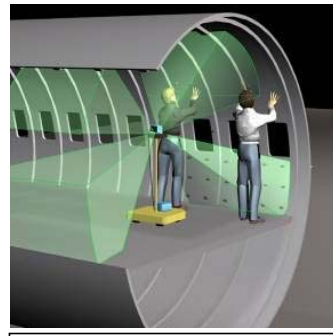
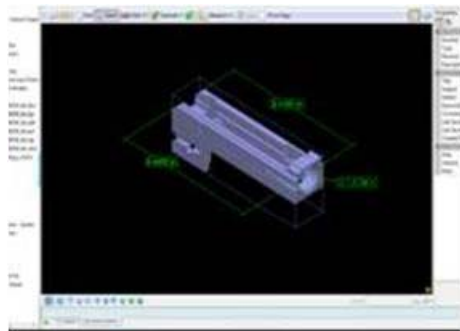


Illustration of Laser Image

Army MT New Uncooled Focal Plane Array - reduced unit cost from \$16K to \$2K per FPA, enabled supply chain to meet future Army procurement requirements

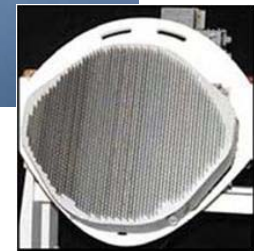


New Model Based Mfg – Piloted new mfg process data on critical M2 Barrels - new supply chain responded and reduced fab time 58%, cost reduced order of magnitude



DLA MT - Met Tank Tread Demand Surge for OIF

- Vital Track component experienced accelerated failures
- Advanced casting tooling method enabled industry to meet surge and demand



AF MT - AESA Radar mfg improvements reduced cost of active transmit/receive module for JSF And F-22 radars - \$745M cost avoidance

Execution

Service & Agency RDT&E Centers

- Scientists & Engineers
- Technology Transfer Managers
- Intellectual Property Attorneys

DTIC - hosted Systems

- Defense Tech Transfer Information System
- IP Management Information System

DoD / Federal Working Groups

- Federal Laboratory Consortium for Tech Transfer
- Interagency Working Group for Tech Transfer
- DoD Tech Transfer Integrated Project Team
- Defense Tech Transfer Working Group
- 1401 Working Group

Facilitation

DoD & Non-DoD Funded Assistance

- DoD-wide Partnership Intermediaries
 - TechLink
 - FirstLink
 - SpringBoard
 - T2Bridge
 - TechMatch
 - MilTech
- DoD / Department of Commerce MOU
- Regional, state, local economic develop organizations

Related DoD Programs

- SBIR / STTR
 - ManTech
 - DACP
 - IR&D
 - TTI



Acquisition

Products & Services

- Industry partner further develops the technology, commercializes, and manufactures a product that is available for procurement and sustainment by the program of record for the Warfighter

Technology Transfer (T2) is the intentional communication of knowledge, expertise, facilities and equipment, and other resources for application to military and non-military systems. It includes spin on, spin off, and dual use.

Partnership Intermediaries

- Provide skill & capabilities not resident in DoD labs:
 - To LABS
 - Proactive, focused, and sustained marketing of lab technologies and capabilities
 - Pursue leads
 - Closer to the marketplace and can employ a technology pull approach
 - Facilitate communications with companies
 - To PARTNERS
 - Help find technology solutions or new product opportunities
 - Make government “red tape” invisible
 - To BOTH
 - conduct market research to establish value of licensable technologies
 - understand expectations
 - develop viable license applications and commercialization plans





www.techlinkcenter.org



KEY ACTIVITIES

1. Licensing DoD-developed technologies to companies
2. Establishing cooperative R&D agreements between DoD labs and companies
3. Helping DoD acquire innovative technologies through the DoD SBIR and IR&D programs

STATISTICS

1. Over 450 technology transfer partnerships established between companies and DoD labs
2. Brokered 50% of all DoD patent licenses nationwide FY 2003-2008
3. Providing 4:1 return on investment to DoD from technology transfer activities



Partnering with the Department of Defense

Welcome

The Door Is Open ...

To introduce technology at the Department of Defense, through TechLink, partnering with DoD for faster product development and commercialization of new technologies has never been easier. From technology showcasing to licensing solutions, TechLink can connect you with the right DoD laboratories and partnering opportunities.

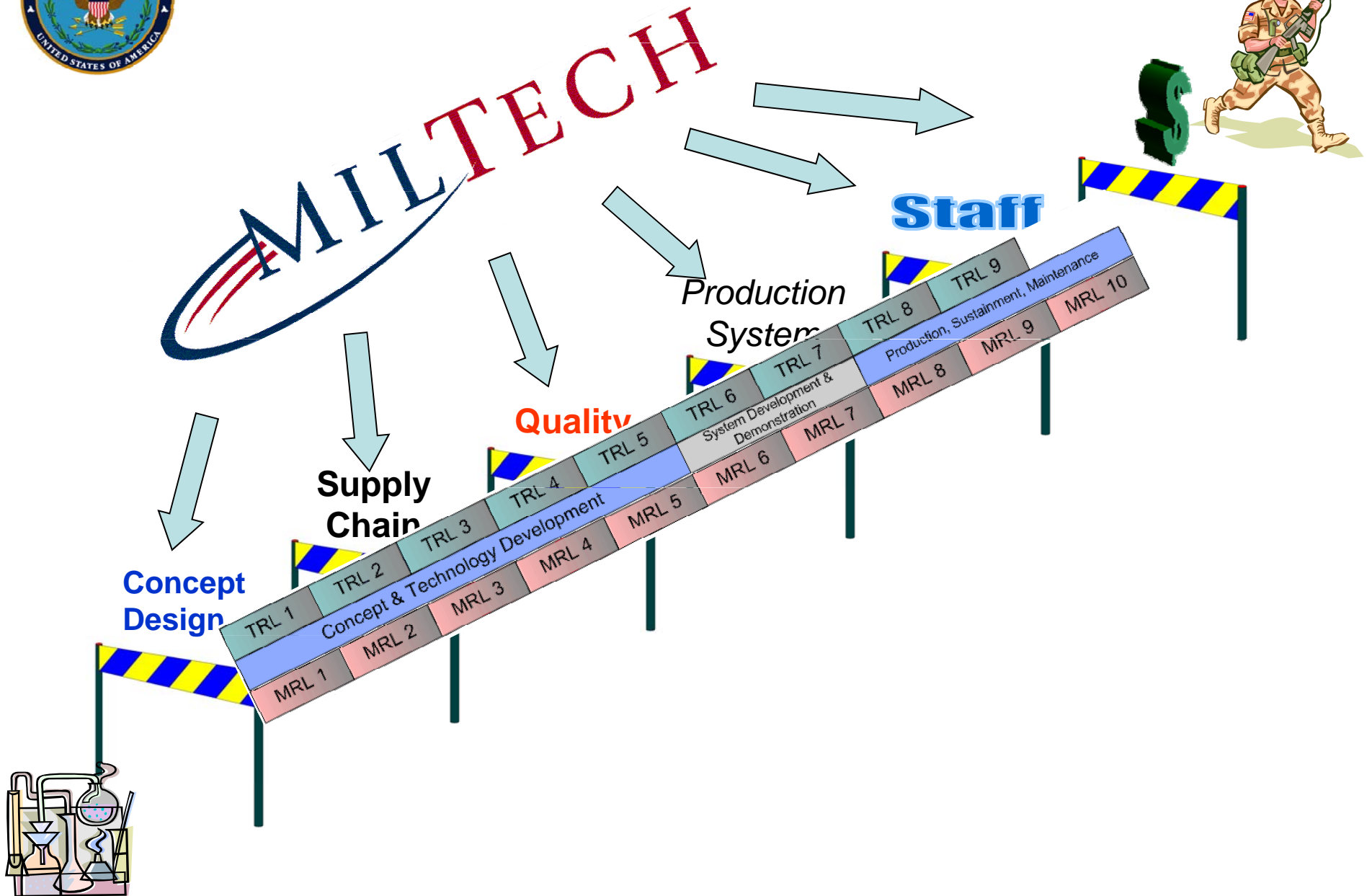
Take the first step. To learn more about TechLink and how it can assist photonics and sensor companies, visit <http://TechLink.msu.com/usa/techlink.htm>.

TechLink Center
Technology Transfer and Commercialization Services
Tel: 488-698-7171 Fax: 488-698-7161 www.montana.edu/techlink

Moving Technology from Minds to Markets →



Tech Transition Hurdles



Technology Transition & Insertion: The View Depends on Where You Sit

- **Warfighters**

- Identify capability gaps, not technologies
- Don't know what equipment they want, except at Radio Shack, Wal-Mart and Toys R Us
- Need short term improvements for today, not tomorrow, much less 1 to 5 years from now

Operators and joint warfighters are hard-pressed to take the time to understand technology

- **Technology Developers**

- Generally, will not listen to the warfighters when they say what they think it is that they want
- Working to create the next generation capability – cost and time are generally not relevant

Conversely, S&T / laboratory engineers do not appreciate what the warfighter needs or acquisition

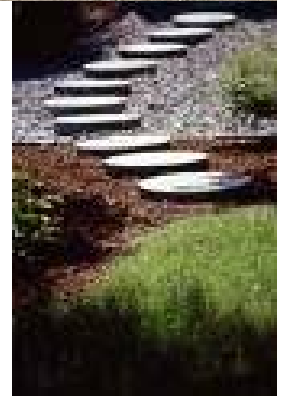
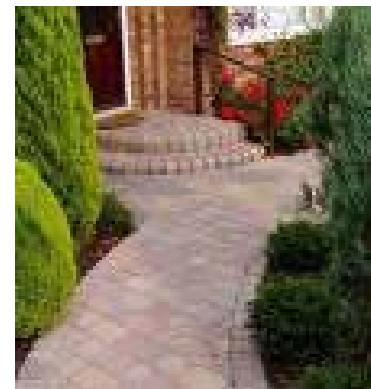
- **Service PMs, SPOs, Programs of Record (PoR)**

- It's cost, schedule, & performance!
- Risk is not desirable and you pay for it

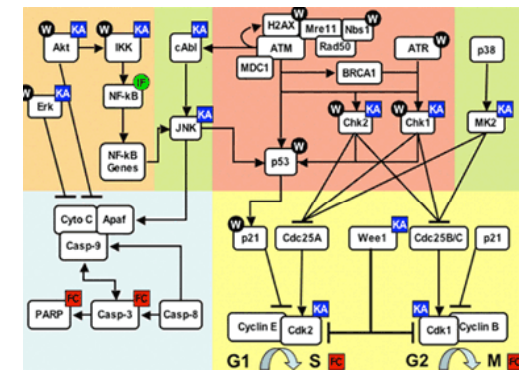
- **The Budget Process, Comptroller, Congress ...**

- DO NOT allow or incentivize risk
- Timing: Two Budget Years plus ...
- Little opportunity for 'quick' insertions within the budget year against a constantly changing threat

When is the last time you or someone you know received recognition for failure?



Pathways to Success





Contact Us

DoD TechMatch: Home - Microsoft Internet Explorer

Address: <http://www.dodtechmatch.com/DOD/index.aspx>

Site Search: Go

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DoD Partnership Intermediary
FA8650-05-3-5821

DoD TechMatch is a web-based portal designed to provide industry and academia a Department of Defense-sponsored solution to find Research & Development Opportunities, Licensable Patents, and information on approximately 120 DoD Labs located across the United States. Registered users will receive a daily e-mail taking them to their matching R&D opportunities from FedBizOpps, Grants.gov, and SBIR/STTR solicitations; Calendar events; and Licensable Patents relevant to your business.

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Opportunities

- Browse SBIR Opportunities
- Browse FedGrant Opportunities
- Browse FedBiz Opportunities
- Browse TechNeeds
- Search SBIR Opportunities
- Search FedGrant Opportunities
- Search FedBiz Opportunities
- Search TechNeeds

Patents

- Browse Patents
- Search Patents

Labs

- Browse Laboratories
- Browse RDT&E Facilities
- Search RDT&E Facilities

Calendar

- View Calendar Events
- Browse Calendar Events
- Search Calendar Events

Success Stories

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Hot Technologies

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[Click here to view the 2008 Hot Technologies Contest Winners](#)

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<http://www.dodtechmatch.com>

BACK-UP SLIDES

Defense Research & Engineering (DDR&E)

Key Transition Programs

	Purpose	Funding	Outcome
Joint Capabilities Technology Demonstration (JCTD)	CoCom capability gaps (joint warfare & GWOT)	~ \$200M	Improved capability for existing programs
Defense Acquisition Challenge (DAC)	Challenge existing technologies	~ \$30M / yr	Test new tech or equipment for DoD use
Foreign Comparative Testing (FCT)	Warfighter benefit from foreign ally	~ \$30M	Test foreign NDI / commercial item for DoD insertion
Technology Transition Initiative (TTI)	Accelerate lab transition to warfighter	~ \$30M	Accelerated insertion into production and/or fielding
Quick Reaction Funds (QRF)	Test emerging technology for acceleration	~ \$30M	Fielded prototype & demo
Rapid Reaction / New Solution (RR/NS)	Test emerging technologies for GWOT	~\$50M	Tested prototype funded by Pentagon for rapid field use
Manufacturing Technology (ManTech) & Mfg. S&T	Develop new or improved mfg. processes	~ \$200M+ (Services) ~ \$10-20M (OSD)	Prototype process for industry building DoD systems
Title III / Defense Production Act (DPA)	Develop critical domestic production capabilities	~ \$18M	New domestic production lines or facilities
Technology Transfer Mechanisms	Transition S&T to market	~ \$2M (DoD) + private	Production sources for military & commercial products
Force Transformation / Operational Experimentation	Integration of technologies & experimentation to meet CoCom needs	~ \$20M / yr	Prototype systems and operational concepts



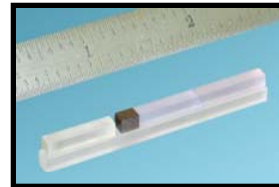
Improved Laser Rangefinder

Objective: Transfer, commercialize, and rapidly transition the Army monoblock laser technology for use in weapon systems

Challenge: “Ruggedize” the monoblock laser for field deployment and overcome manufacturing scale-up hurdles to meet accelerated DoD demand

Technology: A novel, solid-state “monoblock” laser resonator developed by the Army CECOM RDEC Night Vision Lab that reduces the number of components and improves alignment, reducing the size, cost, and power requirements of laser rangefinders

Status: Licensed from the Army by Scientific Materials Corp., Bozeman, MT, with **TechLink** assistance. **MilTech** helped the company ruggedize the laser and overcome manufacturing challenges. Now integrated into the Army’s STORM (Small Tactical Optical Rifle Mounted) laser rangefinder/ target designators. Also being integrated into weapon systems on Stryker vehicles and attack helicopters. Being procured by the Army and deployed in Iraq and Afghanistan.





HemCon Bandage

Objective: Commercialize and rapidly transition the HemCon bandage to warfighter use in Iraq and Afghanistan

Challenge: Overcome manufacturing problems to improve product design, increase production, reduce cost, and ensure timely delivery to meet high DoD demand

Technology: A novel wound dressing that rapidly stops severe bleeding, bonds firmly, sterilizes wounds, and releases readily when desired. Recognized as one of the Army's "Top 10 Greatest Inventions of 2004"

Status: Developed by HemCon, Inc. with funding from the US Army Combat Casualty Care Research Program. **MilTech** helped HemCon to overcome manufacturing challenges to meet high DoD demand. By DoD directive on 9/20/05, every US soldier deployed to Iraq and Afghanistan is required to carry at least one HemCon bandage. Approximately 100,000 HemCon bandages have been delivered to DoD following **MilTech** assistance.





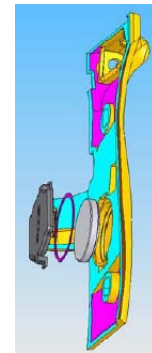
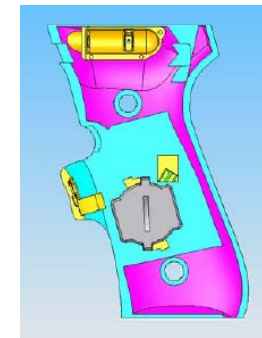
Grip-Activated Laser Aiming System

Objective: Ruggedize and waterproof the internal laser circuitry to improve reliability for DoD use in wet environments

Challenge: The manufacturer, Crimson Trace, lacked the internal R&D staff to develop a ruggedized, waterproofed version of the Lasergrips to meet DoD needs

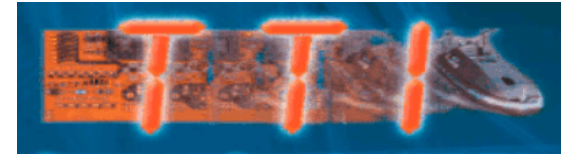
Technology: Compact, grip-activated laser aiming system. “Lasergrips” replace standard grips on a wide range of military pistols. Gentle pressure on the grip activates a laser that projects a red laser beam where the pistol will shoot. “Lasergrips” improve pistol marksmanship training and warfighter lethality.

Status: MilTech successfully bridged the gap between company capabilities and DoD needs by developing a ruggedized, waterproof design of the “Lasergrips” that can be easily manufactured. This improved version is now being procured by SOCOM.





Technology Transition Initiative (TTI)



Congressional Language:

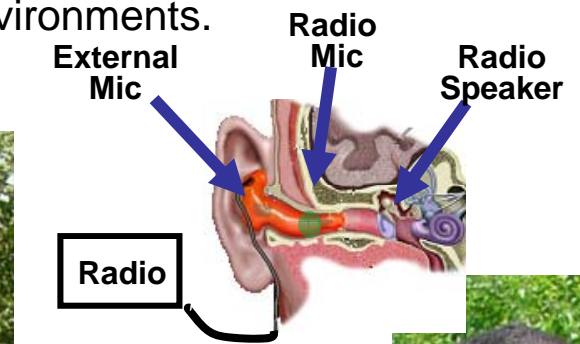
- Facilitate the rapid transition of new technologies from S&T programs of the DoD into acquisition programs of the Department for the production of such technologies.

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- Established exit criteria
- Joint Focus
- Value to the Warfighter
- Technology mature – TRL 6 or 7
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TTI Criteria

Criteria	How evaluated/graded
Commitment to Transition	Most heavily weighted criterion; strong evidence of commitment to incorporate the technology into a weapon system or capability
Value to the Warfighter	Identify direct impact the ability to prosecute/win a war, save lives, or provide other operational enhancements/efficiencies; link to the appropriate Joint Capability Area; near-term impact to Global War on Terror
Established Exit Criteria	Key performance parameters identified
Potential for joint use	Joint Service/Agency/Combatant Command applicability is desirable
Technology Maturity at the time of proposal submission	Mature technologies ready to transition
Funding must accelerate technology transition into DoD acquisition/sustainment programs (Mandatory)	Fills a gap between current S&T and acquisition funding
Cost sharing to leverage TTI funding (Mandatory)	May be R&D, O&M or Procurement funds
Project duration must be 4 years or less (Mandatory)	Shorter duration projects rated higher than longer duration projects; goal is transition in 2 years or less
Technology must be from DoD S&T base (Mandatory)	Legacy funding for technology developed. (6.1, 6.2, 6.3, SBIR, DARPA, etc.)

Globalization of S&T

"In 2001, India graduated almost a million more students from college than the United States did. China graduates twice as many students with bachelor's degrees as the U.S., and they have six times as many graduates majoring in engineering. In the international competition to have the biggest and best supply of knowledge workers, America is falling behind."

--"The World is Flat", Friedman, 2005

China's Gross Domestic Product is now 2nd in the world to the U.S.

For the first time ever, all members of China's Politburo Standing Committee, the highest tier within the Communist Party, are card-carrying engineers.

China had 15 companies on Forbes Global 500 list in 2004, up by 4 from the 2003 rankings.

India had only 1 company on the Global 500 in 2003. In 2004, there are 4 Indian companies.

IBM Global Services India unveiled its global delivery centre in Hyderabad on June 14, 2005, the fifth IBM center in India.

" The last 25 years in technology have just been "the warm-up act." Now we are going into the main event, and by the main event, I mean an era in which technology will truly transform every aspect of business, of government, of society, of life."

***Carly Fiorina, ex-Hewlett-Packard CEO
2004***