It Ain't Business as Usual at DHS S&T

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National Academy of Sciences
Government-University-Industry Research Roundtable

Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer
Director Public-Private Partnerships
Director Research and Development Partnerships (Acting)
Department of Homeland Security
Email: Thomas.Cellucci@dhs.gov
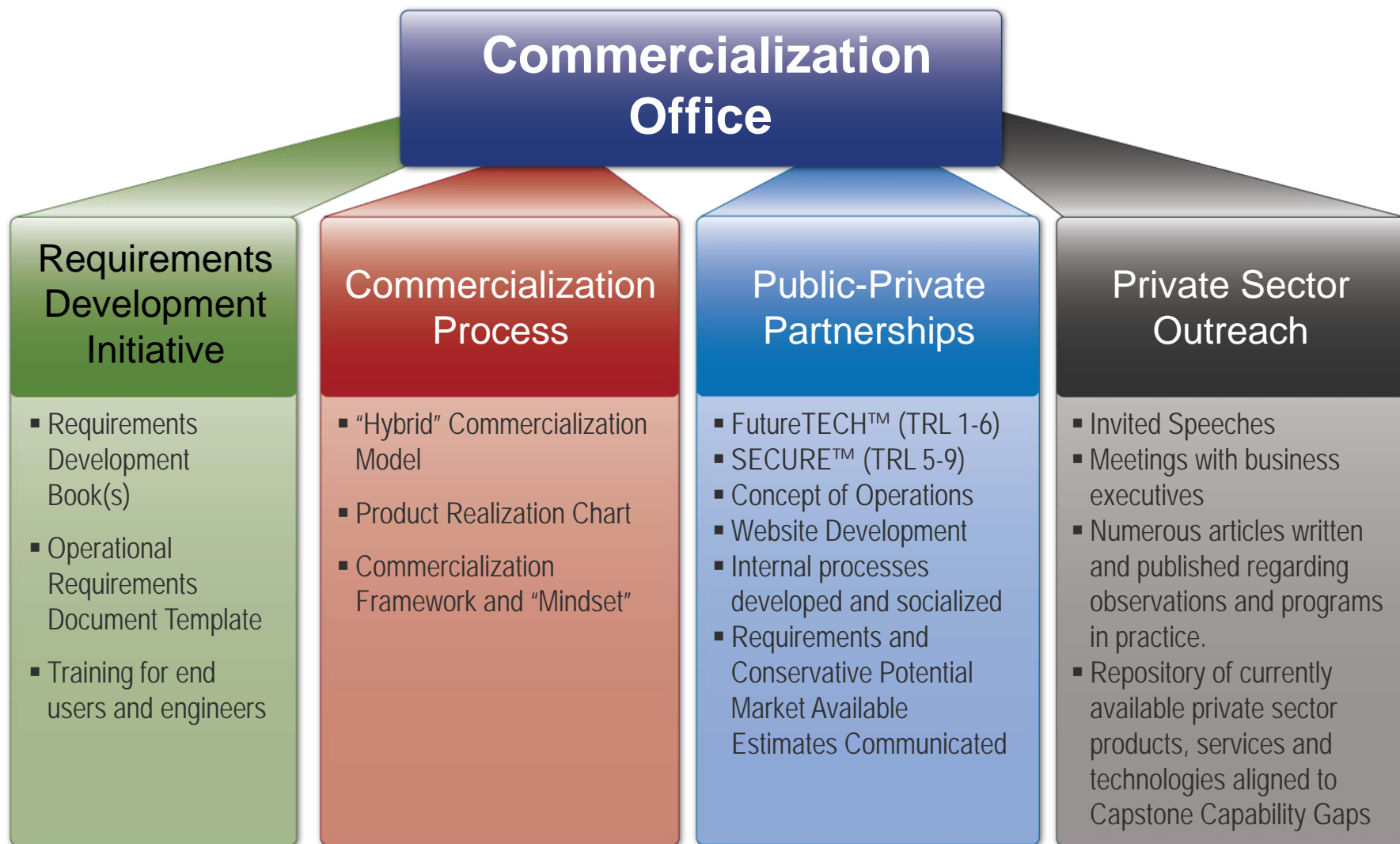Website: http://bit.ly/commercializationresources

Discussion Guide

- Commercialization Office Initiatives at DHS
- New Commercialization Process
- Outreach Efforts
- SECURE Program
- Benefits for Taxpayers, DHS and Private Sector

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Commercialization Office: Major Activities

Commercialization Office

Requirements Development Initiative

- Requirements Development Book(s)
- Operational Requirements Document Template
- Training for end users and engineers

Commercialization Process

- "Hybrid" Commercialization Model
- Product Realization Chart
- Commercialization Framework and "Mindset"

Public-Private Partnerships

- FutureTECH™ (TRL 1-6)
- SECURE™ (TRL 5-9)
- Concept of Operations
- Website Development
- Internal processes developed and socialized
- Requirements and Conservative Potential Market Available Estimates Communicated

Private Sector Outreach

- Invited Speeches
- Meetings with business executives
- Numerous articles written and published regarding observations and programs in practice.
- Repository of currently available private sector products, services and technologies aligned to Capstone Capability Gaps

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http://www.dhs.gov/xabout/structure/gc_1234194479267.shtm

Why a Commercialization Office?: Creating and Demonstrating Value

S&T Commercialization Office -- Four Major Activities

Parameter	Requirements Development Initiative	Commercialization Process	Public-Private Partnerships	S&T Private Sector Outreach
1) Increases speed-of-execution of DHS programs/projects	✓	✓	✓	✓
2) DHS and its stakeholders receive products more closely aligned to specific requirements/needs	✓	✓	✓	✓
3) Increases effective and efficient communication	✓	✓	✓	✓
4) End users can make informed purchasing decisions	✓	✓	✓	✓
5) Large savings of cost and time for DHS and its stakeholders	✓	✓	✓	✓
6) Increases goodwill between taxpayers, private sector and DHS	✓	✓	✓	✓
7) Fosters more opportunities for small, medium and large businesses	✓	✓	✓	✓
8) Large taxpayer savings	✓	✓	✓	✓
9) Possible product "spin-offs" can aid other commercial markets	✓	✓	✓	✓
10) Promotes open and fair competition	✓	✓	✓	✓

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Return-on-DHS Investment is LARGE!

Commercialization Office Highlights:

- White House Office of Science and Technology Policy briefings (Chief Technology Officer Aneesh Chopra)

    - Interagency Working Group on Advanced Manufacturing

    - Startup America

    - Emerging Technologies Interagency Policy Coordination Committee on Nanotechnology

- Homeland Security Council: Recommended priority for FY11-15 for transportation security: SECURE Program

    - Official Rollout and Certification of BRAVE Camera Project March 2011

- Inclusion of commercialization process into DHS Acquisition Directive 102-01

- Homeland Security Advisory Council, Essential Technology Task Force Report June 2008

- "Big Bang Economics": CNN Feature Video with Jeanne Meserve

- "Burned, Baked and Blown Up": Reuters Video with Rob Muir

- Two Federal Certification Programs developed and implemented– SECURE and FutureTECH: Innovative public-private partnerships

- Published eight reference guides (and more than 20 articles) on requirements development and public-private partnerships

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Commercialization Office Reference Guides
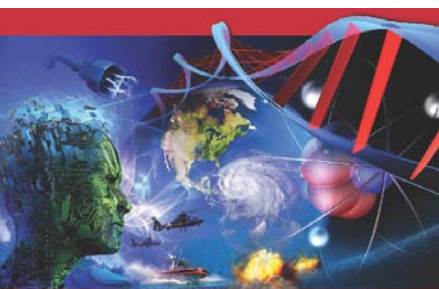
Requirements Development Guide
April 2008
Homeland Security
Science and Technology

Developing Operational Requirements
A Guide to the Cost-Effective and Efficient Communication of Needs
May 2008
Homeland Security

Developing Operational Requirements
A Guide to the Cost-Effective and Efficient Communication of Needs
Version 2.0
November 2008
Homeland Security
Editor:
Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer

Harnessing the Valuable Experience and Resources of the Private Sector for the Public Good:
DHS's Entry into Commercialization
February 2009
Homeland Security
Editor:
Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer

First Responder Capstone IPT
Delivering Solutions to First Responders
May 2009
Homeland Security
Science and Technology
Editors:
Randel L. Zeller
Director, Interagency and First Responder Programs Division
Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer

Critical Infrastructure & Key Resources
Using Commercialization to Develop Solutions Efficiently and Effectively
January 2010
Homeland Security
Editors:
Office of Infrastructure Protection
National Protection and Programs Directorate
Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer

Harnessing the Valuable Experience and Resources of the Private Sector for the Public Good:
Innovative Public-Private Partnerships
June 2010
Homeland Security
Editors:
Douglas A. Smith
Assistant Secretary for the Private Sector
Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer

Innovative Public-Private Partnerships
Pathway to Effectively Solving Problems
July 2010
Homeland Security
Editor:
Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer

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Two Models for Product Realization

Big-A Acquisition

1. Requirements derived by Government
2. RFP and then cost-plus contract(s) with developer(s) (which incentivizes long intervals)
3. Focus on technical performance
4. Production price is secondary (often ignored)
5. Product price is cost-plus
6. Product reaches users via Government deployment

Performance is King

Relationship between end users and product developer is usually remote

?

Is there a "Middle Ground"

Pure Commercialization

1. Requirements derived by Private Sector
2. Product development funded by the developer (which incentivizes short intervals)
3. Technical performance secondary (often reduced in favor of price)
4. Focus on price point
5. Product price is market-based
6. Product reaches users via marketing and sales channels

Performance/Price is King

Relationship between end users and product developer is crucial

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A New Model for Commercialization

1. Development of Operational Requirements Document (ORD)
2. Assess addressable market(s)
3. Publish ORD and market assessment on public DHS web portal, soliciting interest from potential partners
4. Execute no-cost agreement (streamlined CRADA) with multiple Private Sector entities, transferring technology (if necessary)
5. Develop supporting grants and standards as necessary
6. Assess T&E after product is developed
7. New Commercial off the Shelf (COTS) product marketed by Private Sector with DHS support

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Differences from the Acquisition model:

- **Primary criteria for partner selection is market penetration, agility, and performance/price ratio**

- **Product development is not funded by DHS**

- **Government involvement is limited to inherently governmental functions (e.g., Grants and Standards)**

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C-ORD: Commercialization-Operational Requirements Document

What: C-ORDs provide a clear definition and articulation of a given problem.

How: Training materials have been developed to assist drafting C-ORDs.

– *Developing Operational Requirements,* 194pp. Available online:
http://www.dhs.gov/xlibrary/assets/Developing_Operational_Requirements_Guides.pdf

When: For Use in Acquisition, Procurement, Commercialization and Outreach Programs –Any situation that dictates detailed requirements (e.g. RFQ, BAA, RFP, RFI, etc.)

Why: It's cost-effective and efficient for both DHS and all of its stakeholders.
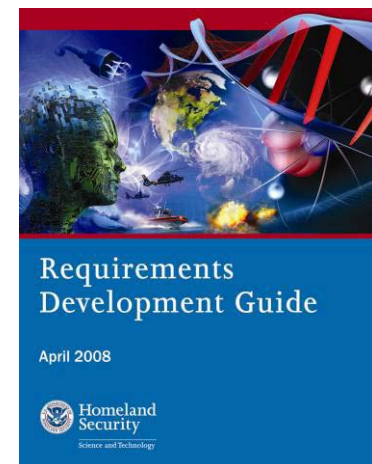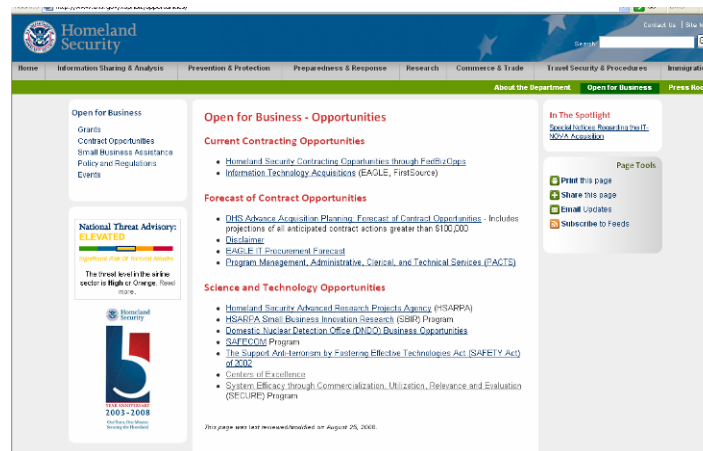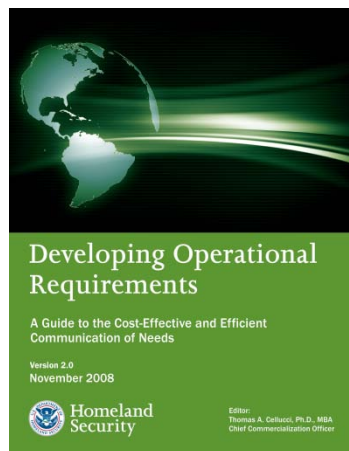
Why SECURE Program?

- **Multi-Use**

  ➢ Provides private sector, in an open and transparent way, with what they need most - - Business Opportunities

  ➢ Provides assurance to DHS, First Responders and private sector users (like CI/KR) that products/services perform as prescribed (and provides vehicle for First Responders, CI/KR owners and operators to voice their requirements)

  ➢ Augments the value of the SAFETY Act

- **Saves Money**

  ➢ Private Sector uses its own resources to develop products and services to the benefit of the taxpayer and the Federal Government

- **Creates Jobs**

  ➢ Detailed articulation of requirements coupled with funded large, potential available markets yield OPPORTUNITY that yields Job Creation (it's better to teach a person to fish than to give them a fish)

  ➢ Enables small firms with innovative technologies to partner with larger firms, VCs and angel investors because of the credibility of having government show detailed requirements with associated market potential (instead of just their own business plans).

- **Efficient Use of Government Funds**

  ➢ Articulating detailed requirements saves time and money. It is better for Government to spend funds to procure products or services that are available for sale and rigorously tested compared to spending money and time to develop new solutions for ill-defined problems.

SECURE Program Benefit Analysis

"Win-Win-Win" Partnerships

Taxpayers	Private Sector	Public Sector
1. Citizens are better protected by DHS personnel using mission critical products	1.Save significant time and money on market and business development activities	1. Improved understanding and communication of needs
2. Tax savings realized through Private Sector investment in DHS	2. Firms can genuinely contribute to the security of the Nation	2. Cost-effective and rapid product development process saves resources
3. Positive economic growth for American economy	3. Successful products share in the "imprimatur of DHS"; providing assurance that products really work	3. Monies can be allocated to perform greater number of essential tasks
4. Possible product "spin-offs" can aid other commercial markets	4. Significant business opportunities with sizeable DHS and DHS ancillary markets	4. End users receive products aligned to specific needs
5. Customers ultimately benefit from COTS produced within the Free Market System – more cost effective and efficient product development	5. Commercialization opportunities for small, medium and large business	5. End users can make informed purchasing decisions with tight budgets

Contact with the Private Sector

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Initial Contact        Private Sector         "Full Response
with Private             requests           Package" sent to
  Sector*           more information        requestors, usually
                                             Within same day
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Company Overview and Marketing Materials Received and Communicated through S&T

Invited Speeches/Presentations

Congressional Referrals

Conference Attendance

Seminar Hosting

Published Articles

Word of Mouth

DHS Website

*Private Sector includes Universities, National Labs, Venture Capitalist and Angel Investor Communities

- "Opportunities for the Private Sector"
- *Developing Operational Requirements*
- "High Priority Technology Needs"
- SECURE Program CONOPS
- Example Company Overview Document
- Operational Requirements Document Template

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Research & Development Partnerships Group

- Office of National Labs
  - Technology Transfer
- Office of University Programs
- Interagency Office
- International Cooperative Programs Office
- Councils: Homeland Security Science & Technology Advisory Committee (HSSTAC) , National Science & Technology Council (NSTC)
- Office of Public-Private Partnerships
  - Office of SAFETY Act Implementation
  - Small Business Innovation Research Office
  - Long Range BAA
  - Commercialization Office
- Special Projects Office
- DHS S&T Research Council

U.S. Department of Homeland Security: Science and Technology Directorate's Chief Commercialization Officer

Dr. Cellucci accepted a five-year appointment from the Department of Homeland Security in August 2007 as the Federal Government's first Chief Commercialization Officer (CCO). He is responsible for initiatives that identify, evaluate and commercialize technology for the specific goal of rapidly developing and deploying products and services that meet the specific operational requirements of the Department of Homeland Security's Operating Components and other DHS stakeholders such as First Responders and Critical Infrastructure/Key Resources owners and operators. Cellucci has also developed and continues to drive the implementation of DHS-S&T's outreach with the private sector to establish and foster mutually beneficial working relationships to facilitate cost-effective and efficient product/service development efforts. His efforts led to the establishment of the DHS-S&T Commercialization Office in October 2008. The Commercialization Office is responsible for four major activities; a requirements development initiative for all DHS stakeholders, the development and implementation of a commercialization process for DHS, development and execution of private sector partnership programs such as SECURE and leading the private sector outreach for the S&T directorate.

Since his appointment, he has published three comprehensive guides [*Requirements Development Guide* (April 2008), *Developing Operational Requirements* (May 2008), and *Developing Operational Requirements, Version 2* (November 2008)] dealing with the development of operational requirements, developed and implemented a commercialization model for the entire department and established the SECURE Program—an innovative public-private partnership to cost-effectively and efficiently develop products and services for DHS's Operating Components and other DHS stakeholders. In addition, he has written over 25 articles and a compilation of works [*Harnessing the Valuable Experiences and Resources of the Private Sector for the Public Good,* (February 2009)] geared toward the private sector to inform the public of new opportunities and ways to work with DHS. Cellucci has received recognition for his outreach efforts and engagement with the small and disadvantaged business communities who learn about potential business opportunities and avenues to provide DHS with critical technologies and products to help secure America.

Cellucci is an accomplished entrepreneur, seasoned senior executive and Board member possessing extensive corporate and VC experience across a number of worldwide industries. Profitably growing high technology firms at the start-up, mid-range and large corporate level has been his trademark. He has authored or co-authored over 139 articles on Requirements development, Commercialization, Nanotechnology, Laser physics, Photonics, Environmental disturbance control, MEMS test and measurement, and Mistake-proofing enterprise software. He has also held the rank of Lecturer or Professor at institutions like Princeton University, University of Pennsylvania and Camden Community College. Cellucci also co-authored ANSI Standard Z136.5 "The Safe Use of Lasers in Educational Institutions". Dr. Cellucci is also a commissioned Admiral and Commander of a Squadron in Texas responsible for civil defense and has been a first responder for over twenty years.

As a result of his consistent achievement in the commercialization of technologies, Cellucci has received numerous awards and citations from industry, government and business. In addition, he has significant experience interacting with high ranking members of the United States government—including the White House, US Senate and US House of Representatives—having provided executive briefs to three Presidents of the United States and ranking members of Congress. Cellucci represents DHS as the first Federal Government member on the U.S. Council on Competitiveness.

Cellucci earned a PhD in Physical Chemistry from the University of Pennsylvania, an MBA from Rutgers University and a BS in Chemistry from Fordham University. He has also attended and lectured at executive programs at the Harvard Business School, MIT Sloan School, Kellogg School and others. Dr. Cellucci is regarded as an authority in rapid time-to-market new product development and is regularly asked to serve as keynote speaker at both business and technical events.

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