



DHS: Leading the way to Help the Private Sector Help Itself

The Office of Infrastructure Protection offers a window into which the private sector can realize significant business opportunities

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Commercialization, broadly described as “the development of markets and the production and delivery of products/services to meet the unsatisfied needs/wants of these markets,” represents a key process that the U.S. Department of Homeland Security (DHS) now uses to generate product/services for its numerous stakeholders in a cost-effective and efficient way. DHS’s primary users of technology-based products are its seven operating components. However, DHS is also a conduit to numerous other users. For example, the Office of Infrastructure Protection (OIP) coordinates 18 Sector Coordinating Councils (SCCs) and Government Coordinating Councils (GCCs) organized under the National Infrastructure Protection Plan (NIPP). These SCCs represent various critical infrastructure/key resources (CI/KR) owners and operators found in the chemical industry to power companies, for example. See Table 1 for the list of SCCs. Critical infrastructure are the assets, systems, and networks, whether physical or virtual, so vital to the United States that their incapacitation or destruction would create a debilitating effect on our security, national economic security, public health or safety, or any combination of the above. Key resources are publicly or privately controlled resources essential to the minimal operations of the economy and government.

Responsible Federal Agency	Sector Coordinating Council
Department of Agriculture Department of Health and Human Services	Agriculture and Food
Department of Defense	Defense Industrial Base
Department of Energy	Energy
Department of Health and Human Services	Public Health and Healthcare
Department of Interior	National Monuments and Icons
Department of Treasury	Banking and Finance
Environmental Protection Agency	Water
DHS’s Office of Infrastructure Protection	Chemical Commercial Facilities Dams Emergency Services Nuclear Reactors, Materials, and Waste Critical Manufacturing
DHS’s Office of Cyber Security and Telecommunications	Information Technology Communications
DHS’s Transportation Security Administration	Postal and Shipping

DHS's Transportation Security Administration, United States Coast Guard	Transportation Systems
DHS's Immigration and Customs Enforcement, Federal Protective Service	Government Facilities

Table 1 – HSPD-7 establishes a national policy for Federal departments and agencies to identify and prioritize critical infrastructure and to protect them from terrorist attacks.

Under Homeland Security Presidential Directive 7 (HSPD-7), Federal departments and agencies will identify, prioritize, and coordinate the protection of critical infrastructure and key resources in order to prevent, deter, and mitigate the effects of deliberate efforts to destroy, incapacitate, or exploit them. Federal departments and agencies work with state and local governments and the private sector to accomplish this objective. The NIPP process provides clarity into the specific needs or requirements of the SCCs, which in turn generates information that yields rough estimates of the potential available markets (PAMs) for solutions that address a particular need.

The recently adopted, commercialization process allows DHS to develop and deliver products/services for the CI/KR community in a more cost-effective and efficient manner as compared to a traditional governmental Acquisition process; all at the benefit of the CI/KR owners and operators in the private sector and, just as importantly, to the benefit of the American taxpayer. Through this commercialization process, DHS is fostering new and innovative partnerships with the private sector to cooperatively develop products/services aligned to the needs of the expansive CI/KR market.

In a relatively short amount of time, DHS has developed, and is now implementing, a “commercialization mindset¹” in its approach to responding to the needs of its valued stakeholders. The idea of utilizing a commercialization process at DHS is a much-needed and significant departure from the commonly employed Acquisition model. Commercialization has the potential to yield significant benefits in terms of reducing federal R&D costs, enabling rapid time-to-market for newly developed commercial products/services for DHS and some of its other stakeholders like first responders and CI/KR owners/operators. Rather than have DHS pay for the development of custom “one-off” systems, which are frequently required in many military applications, it is apparent that DHS has much to offer the private sector in terms of its large potential available markets requiring widely distributed products. Figure 1 shows the major differences between a “pure” Acquisition versus a “pure” commercialization process, and our resultant DHS “hybrid” commercialization process. To put it simply, when widely-distributed products or services are required, commercialization should be utilized at the benefit of the taxpayer, DHS and the private sector.

¹ See, for example, *Developing Operational Requirements, Version 2, Product Realization Chart, DHS Implements a Commercialization Process* and other valuable resources online at http://www.dhs.gov/xres/programs/gc_1211996620526.shtm

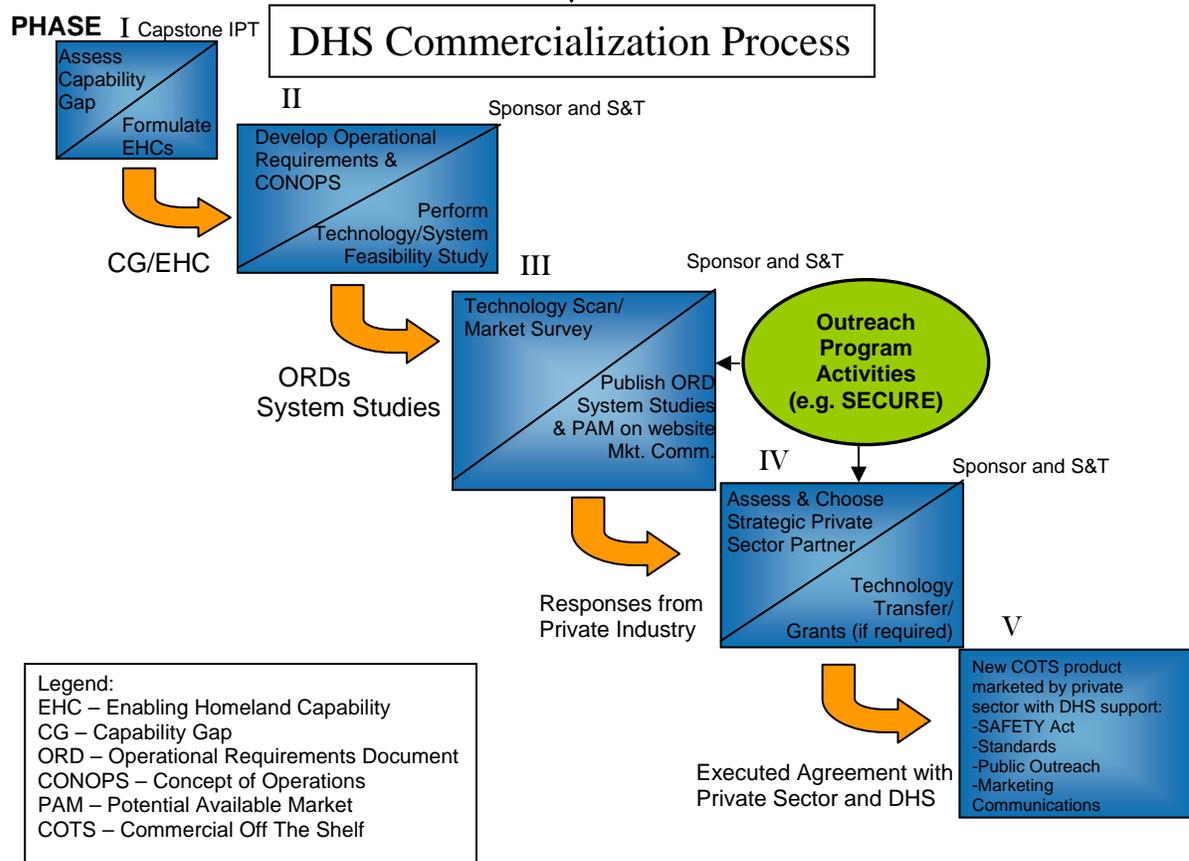
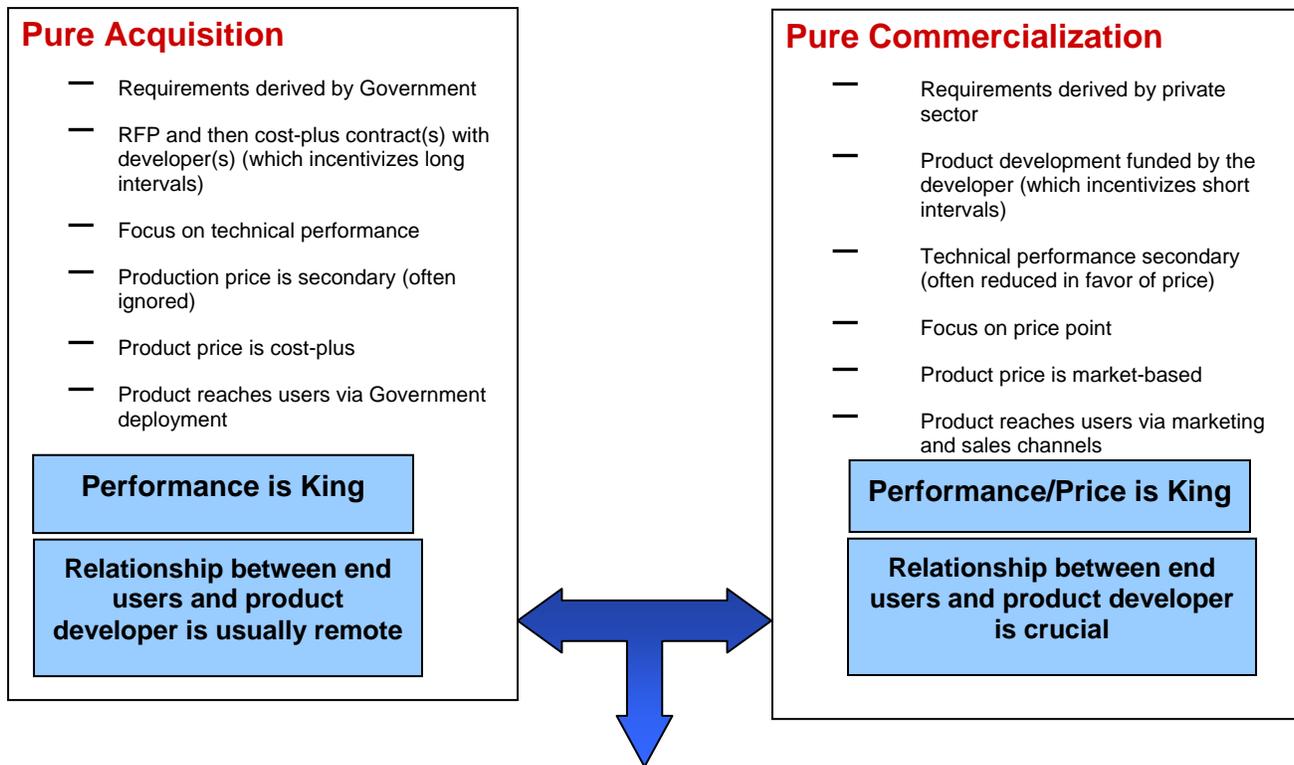


Figure 1 DHS’s commercialization process combines aspects of a “pure” Acquisition and commercialization model resulting in the current “hybrid” commercialization model.

The SECURE (System Efficacy through Commercialization, Utilization, Relevance and Evaluation) Program, outlined in Figure 2, is an innovative public-private sector partnership effort leveraging the DHS commercialization process to meet end-user needs found at DHS, the first responder community and within the CI/KR market. Briefly, the SECURE Program is based on the premise that the private sector has shown repeatedly that it is willing and able to use its own money, resources, expertise and experience to develop and produce fully developed products and services for DHS if significant market potential exists. The private sector has shown remarkable interest in devoting its time and money to such activities if and when an attractive business case can be made related to large revenue/profit opportunities, which certainly exist at DHS and its ancillary markets. The private sector requires two pieces of information from DHS: 1. detailed operational requirements, and 2. a conservative estimate of the potential available market(s) where a given product or service can be used. This information can then be verified by the private sector to generate a business case for their possible participation in the program.

SECURE Program

Overview of Concept of Operations



- **Application** – Seeking products/technologies aligned with posted DHS requirements
- **Selection** – Products/Services TRL-5 or above, scored with internal DHS metrics
- **Agreement** – One-page Cooperative Research and Development (CRADA)-like document that outlines milestones and exit criteria
- **Publication of Results** – Recognized Third-Party T&E conducted on TRL-9 product/service. Results verified by DHS, posted on DHS web-portal
Benefits:
 - ✓ Successful products/technologies share in the imprimatur of DHS
 - ✓ DHS operating components and first responders make informed decisions on products/services aligned to their stated requirements

Figure 2 A brief overview of the SECURE Program Concept of Operations. (See http://www.dhs.gov/xres/programs/gc_1211996620526.shtm)

While the development of highly specialized products is still relevant to the Department, DHS itself represents a substantial potential available market for widely distributed products; in many instances requiring thousands, if not millions of product or service units to address unsatisfied needs. Couple to this the fact that DHS has responsibility for an array of ancillary markets: namely, first responders and CI/KR owners/operators, representing large potential available markets in their own right; it is evident that substantial business opportunities exist for the private sector. The NIPP process brings greater vision into the needs of the 18 SCCs previously described, which

in turn generate the detailed operational requirements necessary for private sector efforts to develop potential solutions. See Figure 3 for a market potential template of the 18 sectors and their major sub-components/applications.

Critical Infrastructure Key Resources (CIKR)																	
Agriculture and Food	Defense Industrial Base	Energy	Public Health and Healthcare	National Monuments and Icons	Banking and Finance	Water	Chemical	Commercial facilities	Emergency Services	Materials Reactors and	Telecommunications	Critical Manufacturing	Retail and Shipping Services	Transportation	Information Technology		
Food Retail \$. _ Units	Defense Contractors \$. _ Units	Coal mining operations \$. _ Units	Public/University hospitals \$. _ Units	Guided tour services \$. _ Units	Credit lending institutions \$. _ Units	Public utilities \$. _ Units	Inorganic chemical production \$. _ Units	Hotels \$. _ Units	Fire Departments \$. _ Units	Electric utilities \$. _ Units	Telephone/Cellular services \$. _ Units	Iron and Steel mills \$. _ Units	United States Postal Service \$. _ Units	AMTRAK \$. _ Units	Hardware providers \$. _ Units		
Farm Equipment \$. _ Units	Industry analysis \$. _ Units	Coal power plants \$. _ Units	Private/For Profit hospitals \$. _ Units	Travel services \$. _ Units	Commercial banking \$. _ Units	Desalination plants \$. _ Units	Organic industrial production \$. _ Units	Shopping centers \$. _ Units	Law enforcement agencies \$. _ Units	Reactor and associated materials \$. _ Units	Satellite data transmission \$. _ Units	Aluminum production and processing \$. _ Units	High volume document and parcel shipping \$. _ Units	Commuter rail \$. _ Units	IT Conglomerates \$. _ Units		
Meat/Poultry Processing \$. _ Units	Think tanks/research institutions \$. _ Units	Coal equipment manufacturers \$. _ Units	Clinics \$. _ Units	Lodging/Hotel \$. _ Units	Private equity \$. _ Units	Treatment plants \$. _ Units	Ceramics \$. _ Units	Stadiums and sport arenas \$. _ Units	Search and rescue teams \$. _ Units	University and educational institutions \$. _ Units	Broadcasting entities \$. _ Units	Nonferrous metal production and processing \$. _ Units	Container shipping services \$. _ Units	Intracity rail services \$. _ Units	Semiconductor production \$. _ Units		
Food Processing \$. _ Units	University partnership programs \$. _ Units	Hydroelectric \$. _ Units	Private medical practices \$. _ Units	Guest services/tourist hospitality \$. _ Units	Consumer banking \$. _ Units	Equipment manufacturers \$. _ Units	Petrochemicals \$. _ Units	Schools \$. _ Units	Ambulance companies \$. _ Units	Control systems \$. _ Units	Broadcast equipment manufacturing \$. _ Units	Engine, Turbine and Power transmission \$. _ Units	Commercial airlines \$. _ Units	Commercial airfare \$. _ Units	Electronics manufacture \$. _ Units		
Dairy Processing \$. _ Units	National laboratories \$. _ Units	Dam operations \$. _ Units	Medical laboratories \$. _ Units	People moving services \$. _ Units	Building societies/Private banks \$. _ Units	Pipe and water control device manufacturers \$. _ Units	Agrochemicals \$. _ Units	Commercial office buildings \$. _ Units	Mountain/Cave/ Mine rescue teams \$. _ Units	Nuclear safety systems \$. _ Units	Radio equipment manufacturing \$. _ Units	Marine shipping \$. _ Units	Private air services \$. _ Units	IT services \$. _ Units			
Dairy Farms \$. _ Units		Wind power \$. _ Units	Pharmaceutical \$. _ Units	Quoting equipment makers \$. _ Units	Merchant banks \$. _ Units		Polymers \$. _ Units	Museums \$. _ Units	Other technical rescue teams \$. _ Units	Waste disposal services \$. _ Units	Intelnet equipment manufacturing \$. _ Units	Trucking industry \$. _ Units	Subway hardware \$. _ Units	IT services \$. _ Units			
Ranching \$. _ Units		Solar power \$. _ Units	Health insurance \$. _ Units	Private security \$. _ Units	Global financial services firms \$. _ Units		Elastomer production \$. _ Units	Zoos and Aquariums \$. _ Units	Bomb disposal units \$. _ Units	Uranium processors \$. _ Units	High speed data transmission \$. _ Units	Airborne shipping \$. _ Units	Cruise lines \$. _ Units	IT services \$. _ Units			
Organic Farming/Sustainable Agriculture \$. _ Units		Public utilities companies \$. _ Units	Medical material providers \$. _ Units	Community development institutions \$. _ Units	Community banks \$. _ Units		Oleochemicals \$. _ Units	Public Libraries \$. _ Units	Blood/Organ transplant supply \$. _ Units	Protective garment manufacturers \$. _ Units	Internet service providers \$. _ Units	Motor Vehicle manufacturing \$. _ Units	Subway systems \$. _ Units	IT services \$. _ Units			
Traditional Planting \$. _ Units		Oil companies \$. _ Units	Medical equipment manufacturers \$. _ Units	Community banks \$. _ Units	Savings and Loans \$. _ Units		Explosives \$. _ Units	Amusement parks \$. _ Units	Amateur radio emergency comms \$. _ Units	Print media \$. _ Units	Railroad rolling stock \$. _ Units	Long-haul maritime shipping \$. _ Units	Software production \$. _ Units	IT services \$. _ Units			
Commercial Fishing \$. _ Units			Medical technology manufacturers \$. _ Units	Credit unions \$. _ Units	Insurance companies \$. _ Units		Fragrance production \$. _ Units	Emergency Road Services \$. _ Units	Public utility protection providers \$. _ Units	Internet technology providers \$. _ Units	Other Transportation equipment \$. _ Units	Trucking \$. _ Units	TV \$. _ Units	IT services \$. _ Units			
			Biotechnology \$. _ Units	Insurance brokerages \$. _ Units	Reinsurance companies \$. _ Units		Chemical wholesale \$. _ Units	Emergency Social services \$. _ Units	Community emergency response teams \$. _ Units			Bus services \$. _ Units	Information security \$. _ Units	IT services \$. _ Units			
				Stock brokerages \$. _ Units	Capital market banks \$. _ Units		Exotic chemicals \$. _ Units	Disaster relief \$. _ Units	Disaster relief teams \$. _ Units			Freight rail services \$. _ Units	Semiconductor equipment \$. _ Units	IT services \$. _ Units			
				Custody services \$. _ Units	Angel investment \$. _ Units			Family relief teams \$. _ Units	Animal control teams \$. _ Units			Roads, Highways, bridges and tunnels \$. _ Units		IT services \$. _ Units			
				Venture capital \$. _ Units				Poison Control units \$. _ Units	Wildlife services \$. _ Units					IT services \$. _ Units			



Figure 3 - Market Potential Template for the CI/KR Market

Given the fragmented nature of the CI/KR communities, DHS, through the Science and Technology Directorate (S&T), created a crosscutting Capstone Integrated Product Team (IPT) to focus solely on the critical infrastructure protection needs and requirements of the CI/KR communities. Figure 4 shows the general organization of a Capstone IPT along with the appropriate functions of each member. Our Infrastructure Protection IPT² works closely with the Office of Infrastructure Protection to reach out to the various CI/KR owners and operators across the country to gain valuable insight into their needs and requirements and provide a forum for them to be addressed.

² Kikla, Richard V. and Cellucci, Thomas A. "Capstone IPTs: Even in Government the Customer Comes First," April 2008.

S&T Transition IPT Members and Function

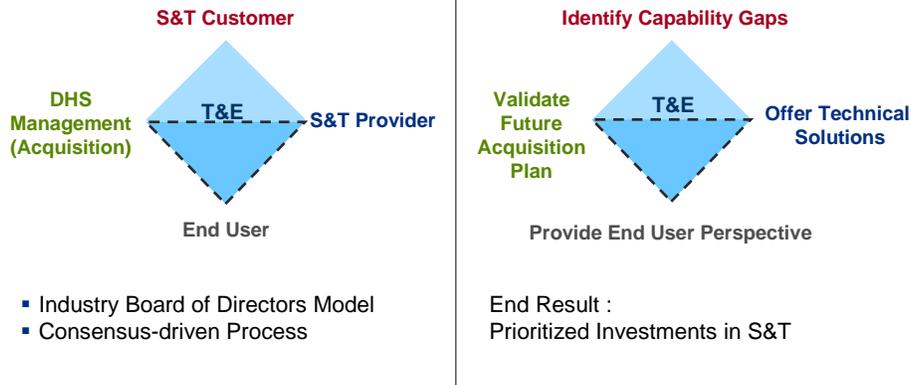


Figure 4 The Infrastructure Protection Capstone IPT will bring together end-users, scientists and program managers to discuss mission-critical capability gaps and requirements.

The Capstone IPT process ensures that quality, efficacious products and services are developed in close alignment with customer needs. Through a network of communication channels, Capstone IPTs bring together S&T division heads, management personnel and end-users (operating components, field agents and supporting first responders and/or CIKR owner/operators) involved in Research, Development, Testing and Evaluation (RDT&E). Working collaboratively, the Infrastructure Protection IPT collects, evaluates and prioritizes requirements to enable new mission-critical capabilities.

In providing critical information to the private sector in terms of the collection and articulation of detailed operational requirements and a conservative estimate of the potential available market, DHS has laid the foundation for cooperative product development with the private sector. These relationships drive the commercialization process and ensure that end-users such as CI/KR owners and operators receive needed products/services in a timely manner at minimal costs to DHS. Given these relationships, it is relatively easy to make a case for commercialization at the Department (see Figure 5) as it results in “wins” for the American taxpayer, public and private sectors.

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

Figure 5 A benefit analysis of the SECURE Program shows a number of positive outcomes for taxpayers as well as the public and private sectors.

In conclusion, our commercialization process is ideal in matching the detailed requirements of the collective CI/KR community with product development efforts undertaken by the private sector who seek access to the large potential available markets. Commercialization is not only an attractive method by which DHS can develop products/services for CI/KR owners and operators – but it is also beneficial to both the public and private sectors and – most importantly – to the American taxpayers at large.



Thomas A. Cellucci, Ph.D., MBA is the U.S. Department of Homeland Security’s first Chief Commercialization Officer. In his role, he recently published two comprehensive guides: *Requirements Development Guide* and *Developing Operational Requirements* to aid in effective requirements development and communication for the department. He possesses extensive experience as a senior executive and Board Member in high-technology

firms in the private sector.

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- **SAFETY Act:** The SAFETY Act enables the development and deployment of qualified anti-terrorism technologies and provides important legal liability protections for manufacturers and sellers of effective technologies. <https://www.safetyact.gov/>
- **TechSolutions:** The mission of TechSolutions is to rapidly address technology gaps identified by Federal, State, Local, and Tribal first responders by fielding prototypical solutions within 12 months at a cost less than \$1M per project. www.dhs.gov/techsolutions
- **Commercialization:** The mission of S&T's commercialization efforts is to identify, evaluate, and commercialize technologies that meet the specific operational requirements of DHS operating components and first responder communities. The commercialization efforts actively reach out to the private sector to establish mutually beneficial working relationships to facilitate cost-effective and efficient product development efforts. Please contact Chief Commercialization Officer Tom Cellucci at S&T-Commercialization@dhs.gov.



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