



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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Public-private partnerships offer new and exciting opportunities to advance the capabilities and mission success of the Department of Homeland Security. This resource introduces the many reasons why public-private partnerships have been effective pathways to greatly increasing the speed-of-execution of product development among many other ancillary benefits. Commercialization-based public-private partnerships have demonstrated ground-breaking advances in the public-private partnership model and will continue to be a driving factor in securing our nation. It is my sincere hope that this resource provides useful insight into the initiatives undertaken to make positive changes in the way government and industry can work together to cooperatively develop solutions to pressing homeland security needs.

Much effort has gone into the development of this book. I would like to specifically thank Mr. Daniel Hooks, Ms. Caroline Greenwood and Mr. Mark Protacio for their assistance as well as countless individuals from the Department who have been “true partners” in promulgating public-private partnerships and the DHS Commercialization process. As usual, please do not hesitate to contact me at SandT_Commercialization@hq.dhs.gov if you need any additional information or want to suggest ways to improve this resource.

Sincerely,

A handwritten signature in black ink that reads "Thomas A. Cellucci". The signature is written in a cursive, flowing style.

Thomas A. Cellucci, Ph.D., MBA
Chief Commercialization Officer
U.S. Department of Homeland Security
Science and Technology Directorate

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Introduction

Public-private partnerships, as defined by the National Council for Public-Private Partnership (NCPPP) are “a contractual agreement between a public agency (federal, state, or local) and a private sector entity.¹ Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility.” Typically, public sectors are government infrastructures: programs that run on taxpayer capital. The private sectors are businesses that are owned by private individuals or shareholders, and not by the government.

Some major benefits of having public-private partnerships are that they: 1) provide a greater efficiency of getting tasks and requirements completed; 2) reduce the spending of taxpayer money; 3) provide improved compliance with government regulations, needs and requirements in regards to the environment and workplace; and improve the quality of services and products.

An Historical Perspective on Public-Private Partnerships

Colonial Period

Public-private partnerships are nothing new to the United States. In fact, public-private partnerships occurred in North America before the Revolutionary War. One of the first people to implement this idea in the New World was John Winthrop, Jr. Born in 1605, Winthrop was the eldest son of the first governor of the Massachusetts Bay Colony. Winthrop and his wife sailed to Boston in 1631, where he obtained political power and influence in both the Massachusetts and Connecticut colonies. In the New World, he was known for being a chemist and scientist, and conducted experiments in obtaining salt from sea water. He was famous for starting one of the first iron works in Massachusetts colony and for establishing “druggist shops” and chemistry laboratories in order to meet the demands for medicine. These pharmacies were considered one of the first science based enterprises in North America. While Winthrop did not create a public-private partnership, he helped start the idea that the government and political leaders should use

and support private businesses in order to progress scientific advancement for the benefit of society.

Elsewhere in the world, the United Kingdom passed the Longitude Act of 1714, where a monetary prize would be offered for a practical solution for sailing ships to determine longitude. Without the ability to accurately find their location, ships would sail off course and often end in tragedy. The British government created a competition among its citizens, where firms and people competed to be the first to find the best way to calculate longitude. With a financial reward at stake, it was the private sector that eagerly answered the demand.

One of the first instances of a public-private partnership in the New World occurred in 1742 when Benjamin Franklin established the American Philosophical Society of Philadelphia. This society, along with the Pennsylvania House of Representatives, sponsored the University of Pennsylvania, the first medical school in the English Colonies with the purpose to make available to all citizens the advancements in agriculture, science and medicine. This showed that public and private sectors could work together harmoniously in advancing the sciences for the common good.

After the American Revolutionary War, the 1787 Constitutional Convention discussed the possibility of creating national universities to promote the sciences. This topic was inspired by the influence that both the American Philosophical Society of Philadelphia and the Boston Philosophical Society had in the progression of scientific research. The Constitutional Convention felt that the national government should not be in direct control over the nation's educational and scientific activities, instead the government should be influential to the universities and research societies through indirect means. One of these indirect means was through public-private partnerships.

1800s

In 1803, President Thomas Jefferson bought 828,800 square miles of land from France, known as the Louisiana Purchase. This more than doubled the size of the United States at the time, and now comprises more than 20% of the present United States. For \$2,500, President

Jefferson hired the expedition team of Meriwether Lewis and William Clark to explore the new land along the Mississippi and Missouri Rivers. With thirty-three members in their party, Lewis and Clark began their journey from the Ohio River to the Pacific Ocean. As well as exploring and mapping a water passage to the Pacific Ocean, they collected and sent back 68 mineral specimens and 108 biological specimens to President Jefferson, one of them being a living prairie dog which had never been seen in the east. This was another example of a private-public partnership funded by the federal government. President Jefferson hired a private team of explorers to increase their scientific knowledge of the western part of the country, so that the American people would benefit from it. This helped increase the country's westward expansion, because of the maps that were made possible by the Lewis and Clark expedition, as well as finding a faster method to travel to the Pacific Ocean that President Jefferson hoped would increase trade and settlement.

Starting in the early 1800s, states began creating science and technology universities. In 1799, Connecticut founded the first State Academy of the Arts and Sciences and the United States Military Academy at West Point, New York was established three years later. Starting in 1824, many more states began establishing academies. The Enlightenment Era, where the scientific method of research was emphasized, saw many more states begin to establish their own universities. The purpose was for citizens of the United States to greatly benefit from the increasing scientific knowledge in the country.

In the 1820s, the Federal Government funded the Franklin Institute in Philadelphia for them to find the cause of a cholera epidemic that was sweeping the country. This is a prime example of how a public need created the motivation to find new technological knowledge provided by the private sector.

Samuel Morse was the inventor of the telegraph and its language, Morse code. In 1843, Congress funded Morse \$30,000 to install an experimental telegraph line from Baltimore, Maryland to Washington, D.C., along the Baltimore and Ohio Railroad (roughly 38 miles in length). This was the first instance in which the federal government funded the private sector for

an experimental product that the government wanted in widespread use. Soon after, the telegraph became a major form of long distance communication.

The Morrill Act of 1862 was passed by Congress which stated that at least one college of agricultural and mechanical sciences would be established by every state. Each state was given 3,000 acres of land per Senator and Representative the state had in order to build these colleges. Like Winthrop, the government started private businesses so that research by those private sectors would benefit the country.

World War I

By the time World War I erupted in Europe, many of the research bases for American companies could be found located in Europe as many scientists lived and taught in European universities. The war proved to be a hindrance to American companies that now had limited access to the research conducted abroad. In response to this, President Woodrow Wilson established the Council of National Defense in 1916 in order to identify domestic research facilities of scientific technological excellence. It was composed of the Secretary of War, the Secretary of the Navy, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, and the Secretary of Labor. Because World War I was a war of technology with the introduction of the tank, machine gun, fighter plane, zeppelin bombers and gas warfare, President Wilson knew that the only way to win the war would be through scientific and technological advancements of weaponry. The mission of the council was to coordinate the placement of resources and industrial goods in case the United States entered the war.

The Great Depression and World War II

During the Great Depression in the 1930s, the Science Committee of the National Resources Committee created the report, "Research: A National Resource" which stated that "there are certain fields of science and technology which the government has a Constitutional responsibility to support. These fields include defense, determination of standards, and certain regulatory functions." This report explicitly stated that one of the duties the federal government had for the American people was to support research.

In June of 1941, just before the United States entered World War II, President Franklin Delano Roosevelt created the National Defense Research Committee, which was headed by the President of the Carnegie Institution, Vannevar Bush. The committee was later changed to the Office of Scientific Research and Development (OSRD), still headed by Vannevar Bush. The OSRD did not conduct any research itself, but instead realized that it could harness many different industries and give them all a specific goal. The OSRD funded the Massachusetts Institute of Technology and the University of California who helped create radar, as well as funding hundreds of industrial sites which resulted in the creation of the DUKW (an amphibious vehicle used in warfare), the proximity fuse, and research which would later be used in the Manhattan Project.

When the end of World War II was in sight, President Roosevelt said that the OSRD “should be used in the days of peace ahead for the improvement of the national health, the creation of new enterprises bringing new jobs, and the betterment of the national standard of living.” Following this, Bush submitted a report called “Science: The Endless Frontier” to President Roosevelt. In his report, Bush stated that “a nation [that] depends upon others for its new basic scientific knowledge will be slow in its industrial progress and weak in its competitive position in world trade, regardless of its mechanical skill” and that “the Government should accept new responsibilities for promoting the flow of new scientific knowledge and the development of scientific talent in [the] youth.”

The chairman of the President’s Scientific Research Board at that time was John Steelman, who wrote a report entitled “Science and Public Policy” for then-President Harry S. Truman. The report contained a list of recommendations on what the federal government should do in order to benefit the country with regards to scientific research. The recommendations were:

1. *Need for Basic Research.* Much of the world is in chaos. We can no longer rely as we once did upon the basic discoveries of Europe. At the same time, our stockpile of unexploited fundamental knowledge is virtually exhausted in crucial areas.
2. *Prosperity.* This Nation is committed to a policy of maintaining full employment and full production. Most of our frontiers have disappeared and our economy can expand

- only with more intensive development of our present resources. Such expansion is unattainable without a stimulated and growing research and development program.
3. *International Progress.* The economic health of the world—and the political health of the world—are both intimately associated with our own economic health. By strengthening our economy through research and development we increase the chances for international economic wellbeing.
 4. *Increasing Cost of Discovery.* The frontiers of scientific knowledge have been swept so far back that the mere continuation of pre-war growth, even in stable dollars, could not possibly permit adequate exploration. This requires more time, more men, more equipment than ever before in industry.
 5. *National Security.* The unsettled international situation requires that our military research and development expenditures be maintained at a high level for the immediate future. Such expenditures may be expected to decrease in time, but they will have to remain large for several years, at least.”

The Cold War

In 1957, the Soviet Union launched the first manmade satellite Sputnik I into orbit. In response, President Dwight D. Eisenhower gave \$1 billion of federal money for support of science, mathematics, and technology graduate education. Eisenhower’s successor, President John F. Kennedy, partnered with the necessary private-sectors organizations in order to complete a moon-landing before the end of the 1960s.

President Richard Nixon also gave federal funding to the private sector for research, this time it was to fund his War on Cancer. This was another example where the federal government gave money to private institutions so that the private businesses would use their influence to better the country.

President Jimmy Carter created research programs that worked on the development of alternative renewable energy sources, such as solar energy and fission.

Current Examples of Public-Private Partnerships

Public-private partnerships can still be found in abundance around the globe. Many local governments use public-private partnerships for the construction of their water management and cleaning facilities. These facilities are built so that they meet the requirements of the Safe Water Drinking Act and the Clean Water Act while holding down costs to the taxpayers.

The Milwaukee Metropolitan Sewage District signed a ten year contract with United Water in order to reduce taxpayer costs as well as improve the city's sewage system and wastewater management. The partnerships worked so well, it was placed in the top ten best performing wastewater and sewage facilities in the nation. The facility also received the AMSA Platinum and Gold Awards for the improved operating standards and decline in waste matter discharges, as well as there being a 30% reduction of production costs.

Another common example of public-private partnerships found today is the construction of transportation infrastructure such as roads and highways. The state and local governments of California, Virginia, and Texas work with private sector companies to build and maintain this infrastructure with limited impacts on taxes. One method to this approach is to create Transportation Oriented Development. This includes the construction of train stations, metro stations, tram stops, and bus stops. This increase in public transportation reduces the amount of roads that need to be made or extended, as well as facilitates the better distribution of urban density. More people are able to commute outside of the urban communities they work in because of the public transportation that reaches out to where they live.

Other nations, like Ireland, utilize public-private partnerships. The reason for the introduction of public-private partnerships in Ireland was due to government frustration with the slow delivery, inefficient development, and overrunning costs that would occur when developing projects in the public-sector. They also found that through public-private partnerships, the public infrastructure's needs would be addressed quicker than if it was to be achieved by traditional means. The Irish government found that it was more cost effective and less time consuming to seek help from the private sector than it was for them to use their own public research and development sectors.

Public-Private Partnerships and the Free Market System

As previously stated, a public-private partnership is an agreement between a public agency and a private sector entity that combines skills and resources to develop a technology, product and/or service that improves the quality of life for the general public. The private sector has been called upon numerous times to use its resources, skills and expertise to perform specific tasks for the public sector. Historically, the public sector has frequently taken an active role in spurring technological advances by directly funding the private sector to fulfill a specialized need that cannot be completed by public sector itself.

The public sector has been motivated to take this active role to promote the development of a given technology or capability because the business case for the private sector's involvement in a certain area is not apparent. In these cases, the public sector relied on the private sector to develop needed capabilities, but had to pay the private sector to divert its valuable (and limited) resources to an area that did not necessarily show a strong potential to provide an acceptable return on investment (ROI) for a company. This could be caused by a number of issues ranging from a high cost to perform the research and development (R&D) to a limited potential available market (PAM) that may have prevented the company from making sufficient profit and returns to the company and its shareholders.

Increasingly, however, users in the public sector are now viewed as stable markets – i.e., a sizeable customer base for the private sector to warrant investments of time and money. A commercialization-based public-private partnership has the same goal as more traditional public-private partnerships, but the method is inspired to leverage positive attributes of the free market system. The introduction of a commercialization-based public-private partnership, developed and implemented at the US Department of Homeland Security (DHS) provides benefits for three constituents of the Homeland Security Enterprise (HSE): the private sector, the public sector and the taxpayer. This is a desirable scenario where there is a “win-win-win” environment created in which all participants are in a position to benefit.

In the free market system, private sector companies and businesses must sell commercial products consumers want to purchase. Commercialization is defined as the process of developing

markets and producing and delivering products and/or services to address the needs of those targeted markets. The development and understanding of markets is a critical undertaking for many companies seeking to gain share of a market, with companies directing significant amounts of money and resources to these activities in addition to its product development efforts. Sometimes a company does not understand the correct needs or demand data of a market or market segment and their product(s) does not sell well. The company's investment in designing, manufacturing and advertising the product can, and is in many cases, be a waste of time and money if the company "misses the mark."

What a commercialization-based public-private partnership offers to the private sector is detailed information and opportunity. The public sector has turned into the "consumer" in this free market scenario, who literally gives the private sector a detailed description of what they need, as well as insight into which agencies would be interested in potentially purchasing a product/service that fulfills these requirements. While it remains prudent business to verify this kind of information, there is considerable value for the private sector to obtain this information because four things are provided to the private sector that would not happen in normal market dynamics: 1) decreases in resources spent researching the market; 2) increases in time and money spent can now be focused on product design and manufacturing; 3) reduces risk of the research data being incorrect, and 4) provides an estimate as to how large the potential market can be.

The development and communication of detailed requirements or needs is the cornerstone to the success of these public-private partnerships. The public sector's ability to collect the needs of its stakeholders will catalyze and support the future actions of the partnership. Requirements definition creates a method in which appropriate decisions about product or system functionality and performance can be made before investing the time and money to develop it. Effective communication with and access to the stakeholders of a given agency will bring greater clarity and understanding to the challenges that they face. Understanding requirements early in the search for solutions removes a great deal of guesswork in the planning stages and helps to ensure that the end-users and product developers are "on the same page." The Requirements Hierarchy (Figure 1) shows how the definition of requirements

must remain traceable to the overall Mission to be accomplished, helping ideas stay on track and working toward a common goal.

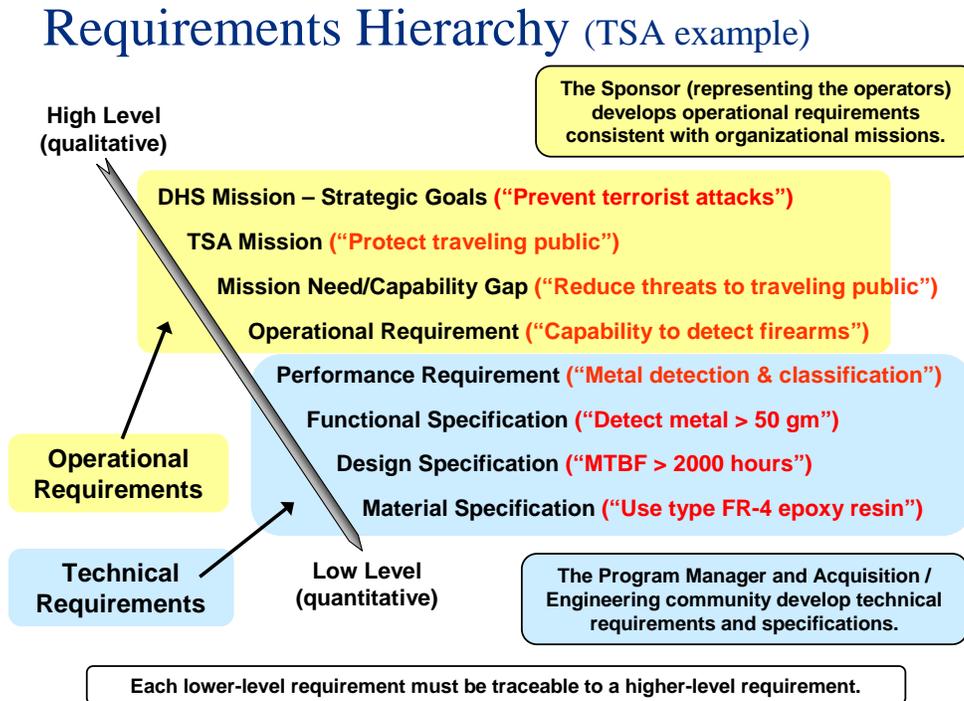


Figure 1. This “requirements hierarchy” shows the evolution of requirements from a high-level macro set of operational requirements to a low-level micro set of technical requirements. Note that each lower level requirement stems directly from its higher requirement so that all requirements are traceable to the overall DHS Mission.

In this partnership model, the proactive articulation and sharing of requirements and needs provides the necessary starting point to begin effective communication with private sector partners. Openly publishing the needs or requirements of public sector stakeholders has a number of ancillary benefits for those involved. A common challenge for solution developers has been a general lack of insight into the exact needs of public sector stakeholders. Instead, the private sector attempts to develop solutions that may not exist and try to sell products based on the merit of its capabilities and features rather than its ability to solve the specific problem of the users. This is a situation where “a solution defines a problem” that it can solve, rather than the problem guiding the development of a solution to close a “capability gap.”

Requirements provide criteria against which solutions can be tested and evaluated. They offer detailed metrics that can be used to objectively measure a possible solution's effectiveness. Detailed operational requirements will guide product development so that solutions' specifications actively solve the stated problem(s). The effective articulation of the requirements creates the mindset in which fulfilling requirements becomes the focus of product development. This requirements-led method places the users' need at the center of all future actions so that solutions are developed and delivered quickly and efficiently.

With more knowledge about the needs and requirements of their potential customers, the private sector is in a better position to consider how their current technology offerings align to needed capabilities. The next thing that must be considered is how many potential users are in a given market to determine if investment of additional resources to develop the solution will provide the necessary returns. In many cases, the market for a commercialization-based public-private partnership is substantial, composed of millions of potentially funded users. In addition, many government agencies across the federal, state, and local government levels may have similar requirements for products and services (if the ability to modify and add or take away options is available). Furthermore, the products developed for the government can often be sold in civilian markets such as critical infrastructure and key resources owners and operators. Even if the government does not purchase a specific company's product, in many cases it can still be useful and have value for non-governmental applications.

Innovative ideas flow freely in the private sector, most especially from small businesses. There is a demand for these innovative technologies as other private sector companies begin to position themselves to address these newly emerging commercial markets found in the private sector. Mergers and acquisitions continue to take place in the private sector as larger companies and investors seek to build their enterprises. Discovering the potential benefits of partnering with the public sector has demonstrated its attractiveness to investor communities like venture capitalists and angel investors. This investment has created more opportunities for those innovative ideas to grow and develop into fully deployable products. Sharing information like needs and requirements provides a defined target that allows those private sector partnerships to

take hold. These strategic partnerships are becoming more common and it is now a regular event for these strategic partners to pursue the public sector together to engage and demonstrate new technology offerings.

A commercialization-based public-private partnership benefits the public sector because the private sector competes in an open and transparent way for the public sector's purchase potential and business. Since companies and businesses openly receive information about the requirements or needs of an identified market, multiple companies may competitively make products/services that meet requirements at the lowest cost to the potential buyer. The end user benefits by being able to purchase the best product at the lowest price.

The taxpayer wins in a commercialization-based public-private partnership because their tax money is not spent on research and development for the private sector. Normally the government pays a company for research and development, yet many products/services are *not* developed. All of this is funded by taxpayers' money, often without much benefit to society. In a commercialization-based public-private partnership, the research and development of the product is *not* paid by government. It is the private-sector that spends money on research and development, and then sells the product to the government at the lowest price. This results in saving the taxpayer money as well and, in fact, expands the net realizable budgets of the public sector. Table 1 shows a chart that outlines the various benefits of commercialization-based public-private partnerships for all parties:

Benefit Analysis – “Win-Win-Win”		
Taxpayers	Public Sector	Private Sector
1. Citizens are better protected by DHS personnel using mission critical products	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

Table 1. The benefits of commercialization-based public-private partnerships are evident for all participants.

Department of Homeland Security Leverages Public-Private Partnerships

Given the current economic situation facing our country, it becomes increasingly important for the public sector to make wise investments of its time, money and resources. Most government agencies do not have the budgets necessary to complete every research and development project that they would like to undertake. The effective prioritization of programs is critical to managing the limited resources available to various agencies. Rigorously developed requirements for each project facilitate these prioritization efforts and increase the ability to perform critical analyses of alternatives (AoAs) used in determining the best course of action to

solve a problem. An analysis of alternatives will uncover a great deal of information on potential solutions that may already exist and is a necessary consideration before pursuing a commercialization public-private partnership. When successful, the option to utilize commercialization public-private partnerships to solve a problem frees resources for those projects that require significant government involvement and expenditure of resources.

The Department of Homeland Security (DHS) through the Science & Technology Directorate (S&T) initiated an innovative commercialization-based public-private partnership called the System Efficacy through Commercialization, Utilization, Relevance and Evaluation (SECURE™) Program. The SECURE Program leverages the resources, experience and expertise to develop and deliver fully deployable solutions aligned to the detailed operational requirements of DHS' many stakeholders. The SECURE Program covers the needs of all of the DHS stakeholders including the operating components (FEMA, TSA, CBP, Secret Service, ICE, USCIS and Coast Guard), but most especially first responders (local police and fire department, hospitals, rescue teams) and critical infrastructure/key resources (CIKR) owners and operators, representing a large market for potential private sector partners. It is the role of DHS to ensure that these stakeholders are provided with the mission-critical capabilities that they need in order to perform their jobs well.

The SECURE Program was developed as a way to address requests for assistance from DHS stakeholders to find better solutions to their problems. These stakeholders were used to a culture where vendors present "solutions looking for problems" and wanted to find a better way to not only have solutions developed to address their needs, but also to have some assurance that the products being sold to them have been thoroughly tested and evaluated in real operational environments. The requirements of these stakeholders are gathered and articulated in a Commercialization Operational Requirements Document (C-ORD). When appropriate, approved C-ORDs are posted online so that potential solution providers or vendors with capability offerings may apply for participation in the SECURE Program. In an open and freely competitive way multiple vendors are able to offer potential solutions to provide the required capabilities outlined in a given C-ORD.

It is important to stress the relationship that DHS has with its non-federal stakeholders in the first responder and CIKR communities. DHS has direct authority over its operating components and can directly influence acquisition activities. This same relationship does not extend to its non-federal stakeholders who are responsible for managing their own budgets and purchasing decisions. Because the SECURE Program is not a procurement activity, DHS is able to share valuable information about its non-federal stakeholders to the private sector and gain knowledge about potential solutions without the need for contracts or monetary exchanges. First responders and non-federal stakeholders now have a unified voice to convey their needs or requirements and gain from the collective size as potential available markets.

The SECURE Program, in addition to leveraging cooperative public-private partnerships, incorporates a rigorous review process based on rigorous operational test and evaluation (OT&E) to ensure that the operational performance of a system is directly aligned to stated stakeholder requirements, but also that the system meets or exceeds the stated performance of the private sector vendor or supplier. This review process analyzes capability requirements in addition to an evaluation of the systems safety record, quality assurance criteria, performance limitations and other considerations to ensure that when a system is deployed in the field it is both effective and safe.

Its “sister program,” FutureTECH focuses on the long-term needs of the Department that require the development of new technologies (see Figure 2: Product Realization Guide) to address future capability gaps. We have demonstrated through the SECURE and FutureTECH programs that the federal government can engage and influence - in a positive way - the private sector by offering detailed requirements and conservative estimates of potential market(s). The reason that these partnerships are successful is simple and straightforward: firms spend significant resources in trying to understand market needs and potentials through their business and market development efforts. By offering this information, government saves the private sector both time and money while demonstrating its genuine desire to work cooperatively to develop technologies and products to meet DHS stakeholders’ needs in a cost-effective and efficient way.

DHS S&T Portfolio	N/A	Basic Research			Innovation and Transition							
Technology Phase	Needs Assessment	Science			Technology Development			Product Development				
Technology Readiness Level (TRL)	N/A	TRL 1 – TRL 3			TRL 4 – TRL 6			TRL 7 – TRL 9				
Manufacturing Readiness Level (MRL)	N/A	MRL 1 – MRL 3			MRL 4 – MRL 6			MRL 7 – MRL 10				
Key Objectives	<ul style="list-style-type: none"> ☐ Identify S&T needs or capability gaps ☐ Rough draft operational requirements are developed (if appropriate) ☐ Market Survey ☐ Technology Scan ☐ Assess technology-based solutions to address gaps. ☐ Investigate the value proposition ☐ Establish technical objectives and milestones. ☐ Conduct preliminary IP review. ☐ Initiate Congressional Appropriations Memo, Technology Transition Agreements (TTAs), Technology Commercialization Agreements (TCAs), Program Descriptions (Research and Innovation) and Feasibility Studies 	TRL 1 <ul style="list-style-type: none"> ☐ "Back of the envelope" environment – new approach ☐ Research hypothesis formulated ☐ Basic scientific principles observed ☐ Physical laws and assumptions used in new technologies/sciences defined ☐ Have some concept in mind that may be realizable ☐ Paper studies support basic principles (literature search) ☐ Formulation of concepts that might be realizable (draft road map) – "If – then" statements ☐ Has a Feasibility Study White Paper been developed? ☐ Has a potential DHS mission space been identified? ☐ How will the program be funded? ☐ Know who cares about technology/science, e.g., sponsor, funding source (users/participants: researchers, national/international, private, government, academia, military) ☐ Know who will perform research and where it will be done 	TRL 2 <ul style="list-style-type: none"> ☐ Basic elements of science/technology have been identified (math/physics/chemistry/analysis/algorithm) ☐ Components of technology/science have been partially characterized ☐ Rigorous analytical studies confirm basic principles ☐ Analytical studies reported in scientific journals/conference proceedings/technical reports ☐ Paper studies show that application is feasible ☐ Potential system or component application(s) have been identified – proof of principle ☐ Performance predictions/uses made of each element ☐ Individual parts of the technology work (no real attempt at integration) ☐ Modeling & Simulation only used to verify physical principles ☐ Know what experiments you need to do (research plan/ approach) ☐ Know capabilities and limitations of researchers and research facilities: identify who/where work to be done ☐ Qualitative idea of risk areas (cost, schedule, performance, impacts of idea) ☐ An apparent theoretical or empirical design solution identified ☐ Identify the DHS area the technology/science will support ☐ Have potential homeland security end-users been identified? ☐ Customer expresses interest in application (market survey?) ☐ Requirement tracking system defined to manage requirements creep ☐ Investment Strategy Sheet (estimated funding requirements for 5 year plan) ☐ Have rough idea of how to market technology (Who is interested, outreach, market survey) ☐ Develop a Technology Roadmap. 	TRL 3 <ul style="list-style-type: none"> ☐ Science known to extent that mathematical and/or computer models and simulations are possible. ☐ Analytical studies verify predictions, algorithms, proof of principle ☐ Preliminary system performance characteristics and measures have been identified and estimated. ☐ Predictions of elements of technology capability validated by Analytical Studies. Recommended next steps. ☐ Paper studies indicate that system components ought to work together ☐ Experiments carried out with small representative data sets (real world) ☐ Laboratory research equipment to verify physical principles identified. ☐ Laboratory experiments verify feasibility (principle, component, subcomponent test or demo) ☐ Scaling studies have been started (size, environment, component integrations) ☐ Description/outline of algorithms available. ☐ Algorithms run in laboratory environment ☐ Scientific feasibility demonstrated ☐ What is the academic environment? ☐ Are there research centers interested in this area of science/ technology? ☐ What technologies exist elsewhere within DHS S&T that may integrate with this program or technology? ☐ Cross-technology uses assessed and identified (multi-use enhancement considered) ☐ Customer/user identified and participates in requirements definition/ generation. ☐ Rudimentary/best value analysis performed, not including cost factors. ☐ Customer identifies transition window(s) of opportunity ☐ Metrics established ☐ Risk areas identified ☐ Risk mitigation strategies identified ☐ Current manufacturing/uses/ application concepts assessed ☐ Producibility needs for key breadboard components identified ☐ Has a Technology Maturity Assessment been conducted? ☐ (Analysis of present state of the art shows that technology fills a need) ☐ Develop Quality Control Plan to include standards conformance, reliability testing, etc. ☐ Develop Marketing Plan to include market size and research. 	TRL 4 <ul style="list-style-type: none"> ☐ All required technology components integrated for Proof of Concept. ☐ Proof of Concept conducted. ☐ IPT briefed on progress of the technology's development. ☐ The customer briefed on the Proof of Concept results. ☐ FRD finalized. ☐ SEMP finalized and updated. (TRL 4, 5, & 6) ☐ TEMP completed and updated. (TRL 4, 5, & 6) ☐ Configuration Management Plan exists. ☐ PMP updated. (TRL 4, 5, and 6) ☐ Risk Management Plan updated. (TRL 4, 5, and 6) ☐ Program Cost Analysis updated. (TRL 4, 5, and 6) ☐ Quality Assurance Plan exists. ☐ Program Transition Manager engaged in transition planning. 	TRL 5 <ul style="list-style-type: none"> ☐ ORD and CONOPS developed. ☐ Security Assessment updated. ☐ OMB 300 and Acquisition Plan completed (if required). ☐ IPT certified readiness for the transition of the Technology. ☐ Program Transition Manager assisted in transition documentation development. ☐ Technology scan and market survey. (ongoing) ☐ Analysis of Alternatives developed and updated. (TRL 5 & 6) ☐ Entry Criteria Checklist completed and delivered to the TM. ☐ PDD created, approved, and signed. (TRL 5 & 6) ☐ Director approved the transition. 	TRL 6 <ul style="list-style-type: none"> ☐ Execute TTA / TCA as applicable ☐ Program Manager identified. ☐ Successful T&E in a simulated operational environment conducted. ☐ End user / customer briefed on the results of T&E. ☐ Initial Security Guidelines developed. ☐ Draft Program Assessment Rating Tool (PART) plan exists, if required. ☐ National Environmental Policy Act (NEPA) plan / assessment. ☐ Interoperability Assessment. 	TRL 7 <ul style="list-style-type: none"> ☐ S&T and the end-user / customer develop final transition plan; Transition Plan developed. (TRL 7 and 8) ☐ Technology successfully demonstrated in an operational environment. (TRL 7 and 8) ☐ Updates made to the ORD. ☐ Risk Management Plan, Program Cost Analysis and PMP updated. ☐ Strategic Program Planning conducted. ☐ Operations and Maintenance Manual completed / updated. ☐ Security Manual developed. ☐ Interoperability demonstrated. ☐ MDs reviewed to assure compliance. 	TRL 8 <ul style="list-style-type: none"> ☐ Technology components are form, fit, and function compatible with an operational system. ☐ Technology production addressed and planned by DHS and the end-user / customer. ☐ Training Plan developed and implemented. (TRL 8 and 9) ☐ Operational Test Report completed. ☐ Limited User Test (LUT) Plan developed. ☐ Physical and functional interfaces clearly defined 	TRL 9 <ul style="list-style-type: none"> ☐ All critical program documentation completed. ☐ Planning underway for the integration of the next generation technology into the existing program components. ☐ End-user fully demonstrates the technology in CONOPS. ☐ Lessons Learned completed. ☐ After Action Review completed. ☐ Sustainment Plan is completed. 		
		Key Deliverables	<ul style="list-style-type: none"> ☐ Preliminary market assessment and technology scan. ☐ Congressional Appropriations Memo, Technology Transition Agreements, Program Descriptions (Research and Innovation), and Feasibility Studies lead to Program and Budget Execution. 	<ul style="list-style-type: none"> ☐ Feasibility Study (White Paper) ☐ Initial scientific observations reported in journals/conference proceedings/technical reports ☐ Literature search report ☐ Road Map (draft) ☐ Written report of findings and recommendations (preliminary product plan). ☐ Feasibility Review meeting. 	<ul style="list-style-type: none"> ☐ Program Cost Analysis ☐ Paper study showing that application is feasible ☐ Modeling & Simulation Report only used to verify physical principles ☐ Market survey identifying potential customer interest ☐ Analytical studies reported in scientific journals/conference proceedings/technical reports ☐ Qualitative idea of risk areas (cost, schedule, performance, impacts of idea) ☐ 5 year Investment Strategy/Funding requirements documented ☐ Preliminary product plans (approved and ongoing). ☐ New Technology roadmaps (approved for further development and implementation). ☐ Updated market assessment and technology scan. ☐ Demonstrate ability to manufacture prototype components 	<ul style="list-style-type: none"> ☐ Technology Maturity Assessment ☐ Program Cost Analysis (updated) ☐ Functional Requirements (draft) ☐ Proof of Concept Plan (Predictions of elements of technology capability validated by Analytical Studies. Recommended next steps.) ☐ Program Management Plan (PMP) draft ☐ End-user/Customer Status Review ☐ Analytical study/test reports. ☐ Detailed product and marketing plan. ☐ Quality control plan. ☐ Optimization Review meeting. ☐ Manufacturing concepts defined 	<ul style="list-style-type: none"> ☐ Proof of Concept Report. ☐ Functional Requirements Document. ☐ SEMP (TRL 4, 5, and 6) ☐ TEMP (TRL 4, 5, and 6) ☐ Quality Assurance Plan. ☐ Configuration Plan Management. ☐ PMP (updated). (TRL 4, 5, & 6) ☐ Risk Management Plan (updated). (TRL 4, 5, and 6) ☐ Program Cost Analysis (updated). (TRL 4, 5, and 6) ☐ End-user / Customer Status Review. 	<ul style="list-style-type: none"> ☐ ORD and CONOPS. ☐ Security Assessment (updated). ☐ Program Definition Document (PDD). ☐ OMB 300 Capital Asset Plan. ☐ Acquisition Plan. ☐ Entry Criteria Checklist. ☐ Analysis of Alternatives. (TRL 5 and 6) ☐ Initial producibility of component technology completed ☐ Initial Manufacturing Plan developed. 	<ul style="list-style-type: none"> ☐ Germane to both Acquisition and Commercialization ☐ Technology Transition Agreement (TTA), or Technology Commercialization Agreement (TCA) as applicable ☐ Initial Security Guidelines. ☐ Draft Program Assessment Rating Tool (PART) plan, if required. ☐ National Environmental Policy Act (NEPA) initial assessment, if required. ☐ Interoperability Assessment. 	<ul style="list-style-type: none"> ☐ Germane to both Acquisition and Commercialization ☐ Transition Plan (draft). ☐ ORD / FRD Documentation ☐ Risk Management Plan ☐ Program Cost Analysis ☐ PMP (updated). ☐ Strategic Program Planning Documentation (if conducted). ☐ Operations/Maintenance Manual ☐ Security Manual. ☐ Finalized Interoperability Assurance Report. (TRL 7 and 8) 	<ul style="list-style-type: none"> ☐ Germane to both Acquisition and Commercialization ☐ Limited User Test (LUT) Plan. ☐ Deployment or Transition Plan. ☐ Training Plan. ☐ Operational Test Report. ☐ Customer Acceptance Document. ☐ Initial Systems-level Metrics Assessment. 	<ul style="list-style-type: none"> ☐ Germane to both Acquisition and Commercialization ☐ Customer Feedback. ☐ Lessons-learned. ☐ After-action Review. ☐ Sustainment Plan is completed (a. Spiral Development Assessment, b. Preplanned Product Improvement, c. Emerging Threat(s) Assessment, d. Technology Refresh / Insertion, e. Quality Assurance / Metrics Report, f. Risk Management Reassessment.).
				<ul style="list-style-type: none"> ☐ MRL1 ☐ Manufacturing implications identified 	<ul style="list-style-type: none"> ☐ MRL2 ☐ Manufacturing concepts identified 	<ul style="list-style-type: none"> ☐ MRL3 ☐ Manufacturing proof of concept developed ☐ Producibility for key breadboard components identified 	<ul style="list-style-type: none"> ☐ Materials, machines and tooling have been demonstrated in a laboratory environment ☐ Producibility assessments initiated 	<ul style="list-style-type: none"> ☐ Manufacturing cost/goals identified. Potential materials sources identified. ☐ Capability to produce prototype components in product relevant environment 	<ul style="list-style-type: none"> ☐ Specific to Commercialization ☐ Finalize Manufacturing Plan. ☐ Finalize engineering documentation. ☐ Update Marketing Plan. ☐ Develop and implement a test plan for quality control. 	<ul style="list-style-type: none"> ☐ Specific to Commercialization ☐ IP Protection and Licensing. ☐ Prepare sales release package. ☐ Verify and update quality control requirements. 	<ul style="list-style-type: none"> ☐ Specific to Commercialization ☐ Finalize quality plan. ☐ Finalize marketing plan. ☐ Finalize manufacturing and assembly routines. 	
Management Review	<ul style="list-style-type: none"> ☐ Capstone IPT and Technology Oversight Group reviews (ongoing) if appropriate. ☐ Corporate review meeting of value proposition and product overview. ☐ Results and follow up actions 	<ul style="list-style-type: none"> ☐ Internal Technical Review ☐ Corporate review meeting to approve preliminary product plan. ☐ Feasibility Review meeting. ☐ Results and follow up actions. ☐ Manufacturing Readiness Assessment (MRA) ☐ Technology Readiness Assessment (TRA) 	<ul style="list-style-type: none"> ☐ Internal Technical Review ☐ Corporate review meeting to approve preliminary product plan and technology roadmap ☐ Results and follow up actions ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Internal Technical Review ☐ Technology Maturity Assessment ☐ Optimization Review meeting. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and Technology Oversight Group (TOG) reviews (ongoing). ☐ Analysis of the engineering and manufacturing plan. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and TOG reviews (ongoing). ☐ Analysis of the engineering and manufacturing plan. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and TOG reviews ☐ Development Phase review meeting. ☐ Comprehensive analysis of the engineering and manufacturing plan. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and TOG reviews ☐ Corporate review of the manufacturing release package. ☐ Pilot Phase review meeting. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and TOG reviews ☐ Analysis and review of the manufacturing plan. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ S&T Director of Transition ☐ Capstone IPT and TOG reviews ☐ Corporate review of the finalized product plan and sales release package. ☐ Sales Release Phase meeting. ☐ MRA ☐ TRA 		
		<ul style="list-style-type: none"> ☐ Capstone IPT and Technology Oversight Group reviews (ongoing) if appropriate. ☐ Corporate review meeting of value proposition and product overview. ☐ Results and follow up actions 	<ul style="list-style-type: none"> ☐ Internal Technical Review ☐ Corporate review meeting to approve preliminary product plan. ☐ Feasibility Review meeting. ☐ Results and follow up actions. ☐ Manufacturing Readiness Assessment (MRA) ☐ Technology Readiness Assessment (TRA) 	<ul style="list-style-type: none"> ☐ Internal Technical Review ☐ Corporate review meeting to approve preliminary product plan and technology roadmap ☐ Results and follow up actions ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Internal Technical Review ☐ Technology Maturity Assessment ☐ Optimization Review meeting. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and Technology Oversight Group (TOG) reviews (ongoing). ☐ Analysis of the engineering and manufacturing plan. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and TOG reviews ☐ Development Phase review meeting. ☐ Comprehensive analysis of the engineering and manufacturing plan. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and TOG reviews ☐ Corporate review of the manufacturing release package. ☐ Pilot Phase review meeting. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ Capstone IPT and TOG reviews ☐ Analysis and review of the manufacturing plan. ☐ Results and follow up actions. ☐ MRA ☐ TRA 	<ul style="list-style-type: none"> ☐ S&T Director of Transition ☐ Capstone IPT and TOG reviews ☐ Corporate review of the finalized product plan and sales release package. ☐ Sales Release Phase meeting. ☐ MRA ☐ TRA 		

U.S. Department of Homeland Security
Commercialization Office January 2010
Legend:
Black Type – Primary Public Sector Blue Type – Primary Private Sector
Red Type – Manufacturing related activities
Definition: Commercialization – the process of developing markets and producing and delivering products or services for sale.

FutureTECH™ Program (TRL 1-6)

SECURE™ Program (TRL 5-9)
SAFETY Act Designation: TRL 6-9 & Certification: TRL9-Deployment

Through the SECURE Program, the Department provides potential solution providers detailed operational requirements and a conservative estimate of the potential available market(s) offered by DHS stakeholders. In exchange for this valuable information, the private sector offers deployable products and services (along with recognized third party test and evaluation data) that meet these stated requirements in an open and free way that creates an ergonomic “clearinghouse of solutions” available to DHS’ stakeholders. Because of the success and “win-win-win” nature of this program in that it provides benefits for the American taxpayer, the private sector and DHS, DHS-S&T recently introduced the FutureTECH Program that describes the long-term capabilities/technologies required by DHS stakeholders.

FutureTECH identifies and focuses on the future needs of the Department as fully deployable technologies and capabilities, which in some cases are not readily available in the private sector or Federal government space. While the SECURE Program is valuable to all DHS operating components, organizational elements and DHS stakeholders, FutureTECH is intended for DHS S&T use only, particularly in the fields/portfolios related to Research and Innovation.

After providing independent third-party testing and evaluation of potential products, services or technologies to show they do in fact meet or exceed the requirements listed in the detailed operational requirements, private sector entities can potentially enter into a partnership with the Department in order to deliver commercial-off-the-shelf (COTS) products to the Department’s stakeholders. In addition to providing products to DHS and its stakeholders, these partnership programs, SECURE¹ and FutureTECH² give the much needed assurance to the First Responder and CIKR communities that a certified product or service works as specified and is aligned to a requirements document.

The products that are developed through this partnership (even the ones that were not purchased by DHS) can be offered to other private sector entities, such as airport security, school and university security, and security for professional sports and concerts, many of whom support the defense of critical infrastructure and key resources nation-wide. There is then an increase in public safety and security, all while the private sector, public sector and taxpayer benefit from the partnership.

¹ Cellucci, Thomas A. “Commercialization Office: Offering Transformational Change Beyond DHS,” June 2009.

² Cellucci, Thomas A. “FutureTECH: Guidance to Understanding Future DHS S&T Critical Research/Innovation Focus Areas,” April 2009.

Execution and Action

The success of the SECURE and FutureTECH pilot programs was the result of effective communication, fostering cooperative relationships and sticking to the plan. The Commercialization Office learned a great deal from the execution of the pilots and from listening with an open mind to the suggestions and recommendations received from partners, colleagues and leadership. Based on this valuable feedback, the Commercialization Office created a detailed flow process and documented the roles and responsibilities for those involved with the program. This is shared in an open and free way and provides a roadmap to potential certification. The processes were developed with the mindset of “keeping it simple and making it easy” for all participants to understand their roles and what is expected of them and when.

This detailed process describes the necessary actions for the successful execution of the SECURE and FutureTECH programs at full participation and buy-in from the Department. As discussed previously, both programs begin with a detailed analysis of the needs and requirements for specific problems facing groups of stakeholders. After an analysis of the needs and requirements, the Department conducts extensive internal evaluations to prioritize potential programs and determine the alignment of these needs to the overall mission of the Department. A number of resources have been created at DHS for the relative prioritization of programs using value-based metrics to quantify the value gained from pursuing a given program.

The Department then publishes approved documents and PAMs. It is at this time that the private sector is able to take advantage of the open and cooperative relationship to develop potential solutions and consider entering into a partnership with the Department. These partnerships are formalized utilizing Cooperative Research and Development Agreements (CRADAs) that describe in detail the relationship, roles and responsibilities and deliverables for each party. Through the CRADA, the private sector partner will be able to submit third party, recognized, independent operational testing and evaluation (IOT&E) for review by the Department and its Subject Matter Experts (SMEs). Certification will be granted to those technologies, products and or services that meet or exceed the operational performance claimed by the private sector partner and are aligned to the needs/requirements contained in the posted 5W or C-ORD documents. The following pages lay out this straightforward process.

	C-ORD Creation/Vetting Phase	Partners Selection Phase	CRADA Development and Execution Phase	Technical Review Phase	SECURE Certification Phase
	<p>Objective: Develop detailed operational requirements (with concepts of operations) for new material capabilities needed by DHS stakeholders</p> <p>Inputs: Mission Needs Statement/Capability Gap/Enhanced Homeland Capability (EHC), DOTMLPF –RGS analysis, requirements elicitation from broad range of DHS stakeholders</p> <p>Output: Representative and well-vetted Commercialization - Operational Requirements Document (C-ORD)</p>	<p>Objective: Identify potential private sector partners capable of delivering required capabilities which can be validated</p> <p>Inputs: Applications from private sector entities seeking to provide solutions to a C-ORD</p> <p>Output: Detailed analysis of a given company’s capabilities, technology/manufacturing maturity and commercialization capabilities and experience</p>	<p>Objective: Outline roles and responsibilities for DHS and private sector partners</p> <p>Inputs: Discussions with Private Sector Partners to develop CRADA and supporting documents</p> <p>Output: Binding CRADA agreement between DHS and private sector partner includes: SOW, Detailed Test Plan, Milestones & Deliverables</p>	<p>Objective: Determine ability of proposed solutions to meet stated requirements and performance specifications</p> <p>Inputs: T&E data from operational tests conducted by recognized third party T&E entity or DHS sponsored test facility</p> <p>Output: Detailed report of T&E data review for operational performance alignment to requirements and performance specifications</p>	<p>Objective: Provide SECURE Certification, if appropriate</p> <p>Inputs: Detailed report on certification package containing T&E data review, vetted ORD, PAM, MNS, AOA, DOTMLPF analysis</p> <p>Output: Determination on granting certification for a potential solution</p>
Requirements Sponsor (e.g. First Responder, CIKR, ...)	<ul style="list-style-type: none"> Elicit needs and requirements from stakeholders (approx. 2-4 months) Communicate with national user associations/organizations Develop Mission Needs Statement (MNS) Conduct DOTMLPF-RGS analysis Ensure requirements are representative of user community Represent user community as necessary Grants development with DHS customer/stakeholder, if required 		<ul style="list-style-type: none"> Provide input on operational considerations necessary to conduct effective operational testing and evaluation (IOT&E) 	<ul style="list-style-type: none"> Assist PM/POC as necessary to evaluate efficacy and alignment of operational performance data to meet/exceed stated C-ORD requirements 	<ul style="list-style-type: none"> End users/customers notified of Certified products
Commercialization Office	<ul style="list-style-type: none"> Assist in C-ORD drafting by offering requirements development materials Assist in analyzing potential available market (PAM) and program prioritization index model (PPI) Assist in analysis of alternatives, technology scans and market scans Continue outreach on “How to do Business with DHS” with private sector Engaged internal and/or external subject matter expert(s)/FFRDC/Non-S&T organization(s) to assist in review of C-ORD, detailed test plan and T&E data Post approved C-ORD and PAM to SECURE Program website, if/when approved by SECURE Review Panel and Internal Review Router 	<ul style="list-style-type: none"> Provide resources to assist in technology/manufacturing maturity assessments and business analysis Manage incoming applications to posted C-ORDs Assist with business analysis of potential partners: experience in commercializing products, business history, likeliness to achieve TRL-9 etc. (approx. 1 week per company) Notify private sector partners of selection or non-selection within one week after decisions are made 	<ul style="list-style-type: none"> Assist PM/POC to develop CRADA and necessary documentation (e.g. SOW, detailed test plan, milestones and deliverables) 	<ul style="list-style-type: none"> Provide resources and materials to develop the criteria necessary for thorough review of IOT&E data. Provide recommendation on certification 	<ul style="list-style-type: none"> Assist PM/POC in preparation of certification package New COTS SECURE Certified product marketed by private sector with DHS support, and oversight of Certification mark usage
PM/POC*	<ul style="list-style-type: none"> Collect and support requirements data/information/documentation articulation from Requirements Sponsor Determine alignment to mission needs/capability gaps Conduct an analysis of alternatives (AOA) and research similar efforts Conduct feasibility study with support from subject matter expert(s), if necessary Identify external sources of information (e.g. subject matter expert(s)) Prepare C-ORD and potential available market (PAM) documents for review by SECURE Review Panel and Internal Review Router Ensure conformance/inclusion of any necessary regulation(s) or standard(s) 	<ul style="list-style-type: none"> Establish timeline for application acceptance cycles Conduct due diligence review of potential partners with assistance of Commercialization Office <ul style="list-style-type: none"> Verify current TRL/MRL of potential solution Analyze likelihood of potential solution to provide desired capability and capability alignment to C-ORD Recommend future action with potential partners to SECURE Review Panel (to be completed within one month of acceptance cycle closing) 	<ul style="list-style-type: none"> Draft CRADA with OGC, Tech Transfer Manager and Commercialization Office (approx. 2-3 weeks) <ul style="list-style-type: none"> Work with private sector partner to determine milestones and deliverables Develop Statement of Work Develop detailed test plan with private sector partner with input from T&E representative Verify TRL-9 maturity is achieved prior to operational test, based on requirements for certification 	<ul style="list-style-type: none"> Provide analysis of capability alignment to stated requirements Evaluate efficacy and alignment of operational performance data to meet/exceed stated C-ORD requirements Communicate questions/comments or clarification needs to private sector partner Provide recommendation on certification 	<ul style="list-style-type: none"> Prepare and present to SECURE Review Panel the supporting documentation in certification package and provide recommendation for certification, if appropriate
SECURE Review Panel**	<ul style="list-style-type: none"> Ensure requirements alignment and priority to overall mission objectives based on MNS, EHC, Capstone IPT Capability Gap Review DOTMLPF-RGS analysis and AOA Accept or decline initial package from PM/POC into SECURE Program prior to reviews by Internal Review Router 	<ul style="list-style-type: none"> Confirm PM/POC analysis of potential private sector partner Approve/Recommend course of action with potential partner(s) to PM/POC 	<ul style="list-style-type: none"> Review documentation and provide approval on CRADA and appendices Authorize final approval of CRADA Approved CRADA signed by Director – S&T Transition and partner 	<ul style="list-style-type: none"> Review analysis from PM/POC and T&E Team to ensure that all data verifies TRL 9/MRL 10 compliance, alignment to ORD and that operational performance meets or exceeds published vendor specifications 	<ul style="list-style-type: none"> Review certification package and recommendation from PM/POC Make final decision on certification of a given product/service
Internal Review Router*	<ul style="list-style-type: none"> Review technical merit of C-ORD accepted by SECURE Review Panel: Are requirements testable, measurable, specific, achievable and solution agnostic? Express opinions with recommendations to SECURE Review Panel Ensure requirements alignment and priority to overall DHS stakeholder mission 				
Subject Matter Expert(s)*	<ul style="list-style-type: none"> Review technical merits of C-ORD accepted by SECURE Review Panel: Are requirements testable, measurable, specific, achievable and solution agnostic? Ensure requirements are representative of user community Provide insight into any similar efforts and leverage existing information/research 		<ul style="list-style-type: none"> Provide input on operational considerations necessary to conduct effective IOT&E 	<ul style="list-style-type: none"> Provide analysis of capability alignment to stated requirements 	
Third Party Independent T&E Team*	<ul style="list-style-type: none"> Review technical merit of C-ORD: Are the requirements testable, measurable, specific, achievable, feasible and solution agnostic? 		<ul style="list-style-type: none"> Assist in reviewing detailed test plan to include measures of reliability, safety, and quality assurance Provide input on technical considerations necessary to conduct effective product testing Provide recommendation on necessary DHS participation during IOT&E Review and modify detailed test plan as required prior to inclusion in CRADA 	<ul style="list-style-type: none"> Validate operational performance data meets/exceed stated specifications Ensure test results and procedures followed detailed test plan Pose questions/comments to PM/POC to relay to partner Provide assessment of whether C-ORD requirements are met 	
Deliverables	<p>Deliverables: (Typical Time Frame: 4-6 months)</p> <ol style="list-style-type: none"> Written report/brief by PM/POC justifying participation in SECURE program including MNS, DOTMLPF-RGS analysis, PAM, AOA and C-ORD is to be distributed and reviewed by SECURE Review Panel (approx. 3-6 months) C-ORD review and feedback loop to confirm accuracy, feasibility and level of detail of requirements performed by SECURE Review Panel and Internal Review Router (approx 3-4 weeks for initial reviews) Preliminary operational testing procedures and potential performers considered Approved C-ORDs will be posted online to the SECURE Program website by the Commercialization Office Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 2 Months)</p> <ol style="list-style-type: none"> Management of interest and questions from potential private sector partners offering their solutions to the stated requirements by Commercialization Office and PM/POC. Conduct detailed analysis of potential solution technology and manufacturing maturity levels and review business standing of potential partners Select private sector partners that demonstrate ability to deliver required capabilities timely and effectively Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 1-2 Months)</p> <ol style="list-style-type: none"> Work in close collaboration with selected private sector partners to develop CRADA, SOW, detailed test plan based on proposed solution Formalize Detailed Test Plan and determine IOT&E sponsorship and responsibilities PM/POC to oversee and monitor progress of private sector partners to achieve milestones and deliverables PM/POC and T&E Team to observe/oversee IOT&E as necessary Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 3-4 weeks)</p> <ol style="list-style-type: none"> The results of performed IOT&E are to be distributed to the PM/POC, T&E Team and Subject Matter Expert(s) as necessary for detailed review and report on findings of IOT&E data. Whenever possible, a paper review of IOT&E data will be used to analyze whether operational performance to address requirements and meet/exceed stated specifications. SECURE Review Panel will review reports written by PM/POC and T&E Team to evaluate conformance of operational performance Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 2-3 Months)</p> <ol style="list-style-type: none"> The finalized certification package and recommendation for certification prepared by PM/POC to be reviewed by SECURE Review Panel Director – S&T Transition analyzes recommendations of SECURE Review Panel signs certification, if appropriate Prepare disclaimers/waivers to be signed by private sector partner if certified Publish certification notice on public websites and approved lists, as appropriate.

This document contains pre-decisional and/or deliberative process information exempt from mandatory disclosure under the Freedom of Information Act, 5 U.S.C. 552(b) (5). Do not release without prior approval of the Department of Homeland Security.

* **Internal Review Router** consists of: PM/POC, S&T Portfolio Manager, S&T Division Director, Third Party Independent T&E Team, and Subject Matter Expert(s)

** **SECURE Review Panel** consists of: Director - APMD; Director – S&T Transition; Director – S&T Innovation; Technology Transfer Manager; OGC representative (S&T); Chief Commercialization Officer, and Director – S&T Transition (Final sign-off)

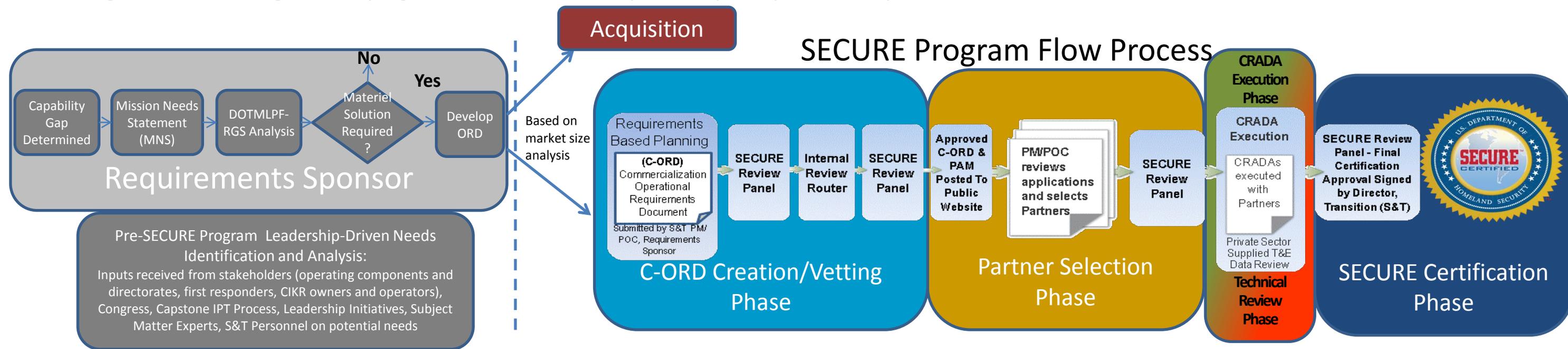
Acronym Legend:
DOTMLPF-RGS: Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities – Regulations, Grants, Standards
AOA: Analysis of Alternatives
MNS: Mission Needs Statement

IOT&E: Independent Operational Testing and Evaluation
EHC: Enabling Homeland Capability
PAM: Potential Available Market
C-ORD: Commercialization – Operational Requirements Document
PM/POC: Program Manager/Point of Contact

TRL/MRL: Technology Readiness Level/Manufacturing Readiness Level
SOW: Statement of Work
CRADA: Cooperative Research and Development Agreement
CIKR: Critical Infrastructure & Key Resources
PPI: Program Prioritization Index

SECURE™: System Efficacy through Commercialization Utilization Relevance and Evaluation

The SECURE™ Program is an innovative public-private partnership designed to leverage the experience, expertise and resources of the private sector to develop required capabilities for Department stakeholders efficiently, cost-effectively and with an emphasis on speed of execution. The SECURE Program's primary focus is on the non-federal first responders and critical infrastructure/key resources (CIKR) owners and operators. The Commercialization Office is responsible for the management and oversight of the program and will work closely with all participants in the process.



SECURE Program Roles and Responsibilities

Commercialization Office Resource Library

- Product Realization Guide (TRA/MRA Guidelines)
- TSD's TRL Guide
- Program Prioritization Index (PPI) Model
- C-ORD Template
- CRADA Template
- Due Diligence Questions for Potential Partners
- Nationally Recognized Testing Laboratories (NRTLs) List
- SECURE Overview and Concept of Operations
- External and Internal SECURE Application Forms
- SECURE Certification Document (Under OGC Review)
- Market Analysis Templates [PAMs]
- SECURE Program Flow Process Brief
- SECURE Program Swim Lane Chart
- DHS S&T RL Calculator and User's Manual, Ver. 1.1

Requirements Sponsor: A Requirements Sponsor represents the operational needs of the cognizant organizational element and ultimately the end-users of the required system. The Sponsor conducts mission analysis, identifies capability gaps, conducts requirements analysis, and participates in long range planning process and the prioritization of needs. The Sponsor's final requirements are formally documented in an Operational Requirements Document. The Sponsor participates in all phases of the development to ensure that the item or system being developed meets operational requirements. In many contexts, the word "Sponsor" refers to the sponsoring organization, and the term "Sponsor's representative" is the person empowered to represent the Sponsor for a given investment.

Program Manager (PM)/Point of Contact (POC): The PM/POC will be the S&T representative responsible for managing the execution of the SECURE Program Flow Process. The PM/POC will coordinate with the requirements sponsor to determine the capability gaps and requirements of the stakeholder community. PM/POC will also conduct DOTMLPF analysis to ensure that a materiel need exists and that the SECURE program is a viable option to realize product development. PM/POC will be responsible for creating and maintaining the certification package over the course of executing the Program. PM/POC will provide necessary briefs to SECURE Review Panel, manage interactions with the private sector and serve as the central point of contact for questions relating a particular C-ORD. The PM/POC will provide recommendation on certification to the Director – S&T Transition.

SECURE Review Panel: The Panel is a group familiar with the strategic goals and mission of the Department and its stakeholders. The Panel is responsible for accepting C-ORDs for inclusion in the SECURE Program based on C-ORD alignment of overall mission needs and priorities. The Panel also determines whether a materiel solution is best to address a capability gap and that the SECURE Program is a viable option for the development of new products and/or services for Department stakeholders. The Panel also participates in the review of CRADAs and T&E reports and will advise the Director – S&T Transition with recommendations for certification.

Internal Review Router: The Internal Review Router will provide a technical review of C-ORDs accepted into the SECURE Program by the SECURE Review Panel. The Internal Review Router members will provide technical feedback and recommended changes to the SECURE Review Panel and PM/POC. Members will review C-ORDs to ensure that the requirements are specific, achievable, testable, measurable, feasible and are solution agnostic. (Note: Individual members of the Internal Review Router may have additional roles and responsibilities within the SECURE Program process. For example, the T&E representative and subject matter experts are critical in the review of)

Third Party Independent T&E Team: The Third Party Independent T&E Team will provide subject matter expertise on the necessary test and evaluation considerations related to the SECURE Program. The T&E Team, as a member of the Internal Review Router, reviews C-ORDs for technical merit and ensure compliance or conformity to any relevant standards and regulations. The T&E Team will also confer with the SECURE Review Panel for the preliminary discussions on operational test and evaluation considerations. The T&E Team is responsible to review and modify the detailed test plan, developed by the PM/POC and selected private sector partners. A T&E representative may elect to observe/oversee the conduct of operational testing and evaluation as warranted by the type of testing required. The T&E Team also contributes to the paper review of T&E data submitted by the private sector and ensures that all testing was performed in accordance with the written detailed test plan and that the data contained in the T&E results demonstrate that the operational performance of a system meets or exceeds the stated specifications of a potential private sector partner and provides an assessment of whether C-ORD requirements are met..

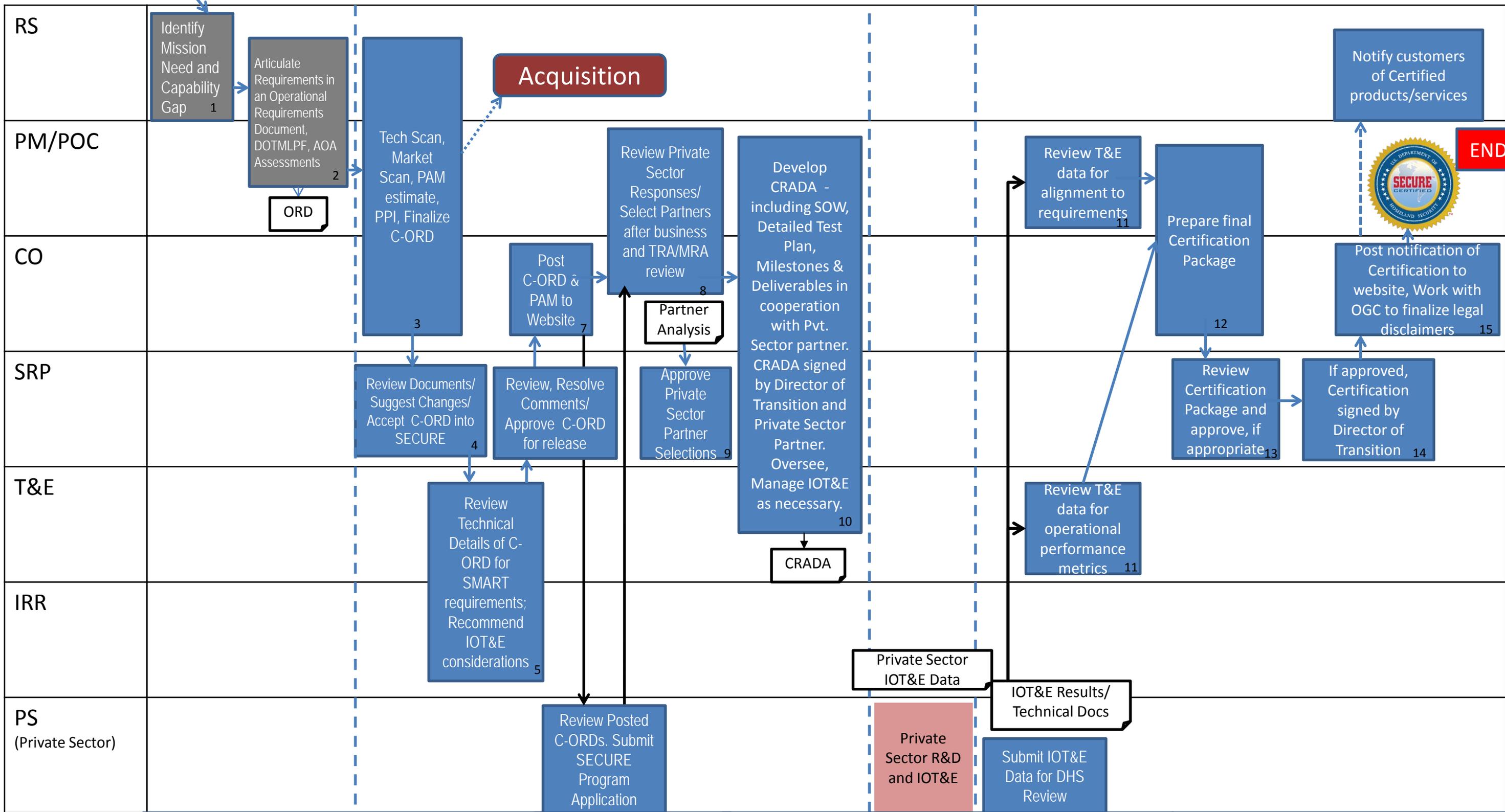
Commercialization Office: The Commercialization Office is responsible for the overall execution of the SECURE Program. The Commercialization Office will assist during all phases of the SECURE Program to ensure uniform guidelines and resources are available to facilitate the completion of all phases. The Commercialization Office will work closely will all participants of the SECURE Program and address any questions that may arise. The Commercialization Office is also responsible for the continued private sector outreach to promote and enhance the engagement of the private sector in the SECURE Program. The Commercialization Office will also assist the PM/POC in conducting market analyses and evaluating potential private sector partners. The Chief Commercialization Officer (CCO) is also a member of the SECURE Review Panel.

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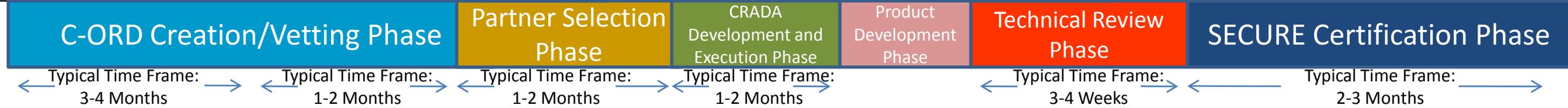
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SECURE™ Program Swim Lane Chart

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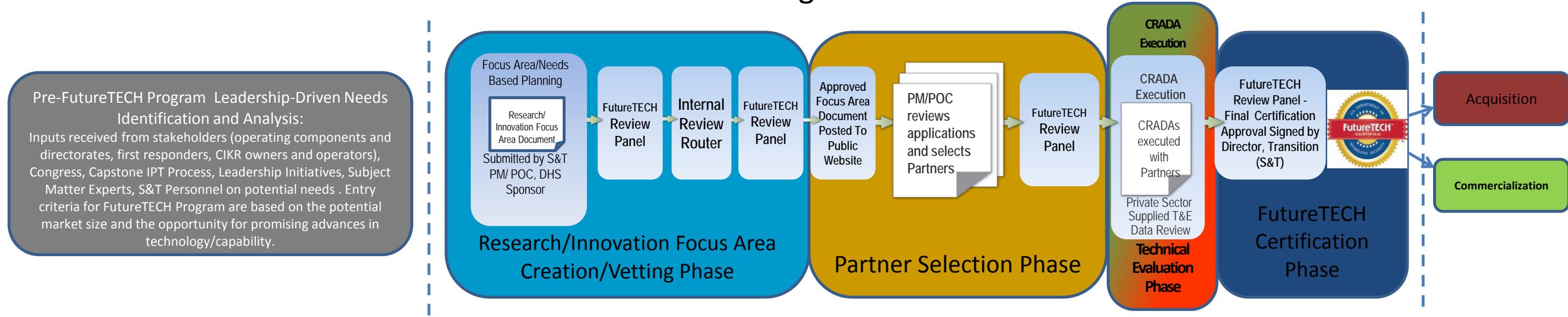


This document contains pre-decisional and/or deliberative process information exempt from mandatory disclosure under the Freedom of Information Act, 5 U.S.C. 552(b) (5). Do not release without prior approval of the Department of Homeland Security.

FutureTECH™

The FutureTECH™ Program is an innovative public-private partnership designed to leverage the experience, expertise and resources of the private sector to develop required technologies/capabilities for Department stakeholders efficiently, cost-effectively and with an emphasis on speed of execution. The FutureTECH Program’s primary focus is on the non-federal first responders and critical infrastructure/key resources (CIKR) owners and operators. The FutureTECH Program is reserved for those research/innovation focus areas that could be inserted eventually into DHS acquisition or commercialization programs when development reaches TRL-6, which is described as a representative model or prototype system or subsystem that is tested in a relevant environment. The S&T Commercialization Office is responsible for the management and oversight of the program and will work closely with all participants in the process.

FutureTECH Program Flow Process



FutureTECH Program Roles and Responsibilities

Commercialization Office Resource Library

- Product Realization Guide (TRA/MRA Guidelines)
- TSD’s TRL Guide
- MD on TRAs at DHS S&T
- MD for CRADAS at DHS S&T
- Program Prioritization Index (PPI) Model
- Research/Innovation Focus Area Template
- CRADA Template
- Due Diligence Questions for Potential Partners
- Nationally Recognized Testing Laboratories (NRTLs) List
- FutureTECH Overview and Concept of Operations
- External and Internal FutureTECH Application Forms
- FutureTECH Certification Document (Under OGC Review)
- FutureTECH Program Flow Process Brief
- FutureTECH Program Swim Lane Chart

DHS Sponsor: A DHS Sponsor represents the research/innovation needs of the cognizant organizational element and ultimately the end-users of the required technology/capability. The Sponsor conducts mission analysis, identifies capability gaps, and participates in long range planning process and the prioritization of needs. The Sponsor’s final research/innovation focus areas/needs are formally documented in a research/innovation focus area document. The Sponsor participates in all phases of the development to ensure that the technology or capability being developed meets research/innovation focus areas/needs. In many contexts, the word “Sponsor” refers to the sponsoring organization, and the term “Sponsor’s representative” is the person representing the Sponsor for a given investment.

Program Manager (PM)/Point of Contact (POC): The PM/POC will be the S&T representative responsible for managing the execution of the FutureTECH Program Flow Process. The PM/POC will coordinate with the DHS sponsor to determine the capability gaps and research/innovation focus areas/needs of the stakeholder community. PM/POC will also participate in DOTMLPF-RGS analysis to ensure that a research/innovation need exists and that the FutureTECH program is a viable option to realize technology development. PM/POC will be responsible for creating and maintaining the certification package over the course of executing the Program. PM/POC will provide necessary briefs to FutureTECH Review Panel, manage interactions with the private sector and serve as the central point of contact for questions relating a particular research/innovation focus area document. The PM/POC will provide recommendation on certification to the Director – S&T Transition.

FutureTECH Review Panel: The Panel is a group familiar with the strategic goals and mission of the Department and its stakeholders. The Panel is responsible for accepting research/innovation focus areas/needs for inclusion in the FutureTECH Program based on research/innovation focus area document alignment to overall mission needs and priorities. The Panel also determines whether a technology solution is necessary to address a capability gap and that the FutureTECH Program is a viable option for the development of new technologies/capabilities for Department stakeholders. The Panel also participates in the review of CRADAs and T&E reports and will advise the Director – S&T Transition with recommendations for certification.

Internal Review Router: The Internal Review Router will provide a technical review of research/innovation focus area documents accepted into the FutureTECH Program by the FutureTECH Review Panel. The Internal Review Router members will provide technical feedback and recommended changes to the FutureTECH Review Panel and PM/POC . Members will review research/innovation focus area documents to ensure that the preliminary requirements are specific, achievable, testable, measurable, feasible and are solution agnostic. (Note: Individual members of the Internal Review Router may have additional roles and responsibilities within the FutureTECH Program process. For example, the T&E Team and subject matter experts are critical in providing input on technical considerations necessary to conduct effective capability testing.)

Third Party Independent T&E Team: The Third Party Independent T&E Team will provide subject matter expertise on the necessary test and evaluation considerations related to the FutureTECH Program. The T&E Team, as a member of the Internal Review Router, reviews research/innovation focus area documents for technical merit and ensure compliance or conformity to any relevant standards and regulations. The T&E Team will also confer with the FutureTECH Review Panel for the preliminary discussions on developmental test and evaluation considerations/technology readiness assessments. The T&E Team is responsible to review and modify the developmental plan, developed by the PM/POC and selected private sector partners. The T&E Team may elect to observe/oversee the conduct of testing and evaluation as warranted by the type of testing required. The T&E Team also contributes to the paper review of T&E data submitted by the private sector and ensures that all testing was performed in accordance with the written developmental test plan and that the data contained in the T&E results demonstrate that the performance of a technology/capability meets or exceeds the stated specifications of a potential private sector partner and provides an assessment of whether research/innovation focus area needs are met.

Commercialization Office: The Commercialization Office is responsible for the overall execution of the FutureTECH Program. The Commercialization Office will assist during all phases of the FutureTECH Program to ensure uniform guidelines and resources are available to facilitate the completion of all phases. The Commercialization Office will work closely will all participants of the FutureTECH Program and address any questions that may arise. The Commercialization Office is also responsible for the continued private sector outreach to promote and enhance the engagement of the private sector in the FutureTECH Program. The Commercialization Office will also assist the PM/POC in conducting market analyses and evaluating potential private sector partners. The Chief Commercialization Officer (CCO) is also a member of the FutureTECH Review Panel.

FutureTECH™ Program: Public-Private Technology Certification Process

	Research/Innovation Focus Area Creation/Vetting Phase	Partners Selection Phase	CRADA Execution and Technology Development Phase	Technical Evaluation Phase	FutureTECH Certification Phase
	<p>Objective: Develop research/innovation focus areas/needs for potential materiel capabilities needed by DHS stakeholders</p> <p>Inputs: Mission Needs Statement/Capability Gap/Enhanced Homeland Capability (EHC), DOTMLPF –RGS analysis, preliminary requirements elicitation from broad range of DHS stakeholders</p> <p>Output: Representative and well-vetted research/innovation focus area documents</p>	<p>Objective: Identify potential private sector partners capable of delivering required capabilities which can be validated</p> <p>Inputs: Applications from private sector entities seeking to provide capabilities/technologies to a research/innovation focus area/need</p> <p>Output: Detailed analysis of a given company’s capabilities, technology/manufacturing maturity, capabilities and experience</p>	<p>Objective: Outline roles and responsibilities for DHS and private sector partners</p> <p>Inputs: Discussions with Private Sector Partners to develop CRADA and supporting documents</p> <p>Output: Binding CRADA agreement between DHS and private sector partner includes: SOW, developmental test plan/TRA, Milestones & Deliverables</p>	<p>Objective: Determine ability of proposed technologies to meet stated research/innovation focus areas /needs and performance specifications</p> <p>Inputs: T&E data from developmental test plan/TRA conducted by recognized third party T&E entity or DHS sponsored test facility</p> <p>Output: Detailed report of T&E data review for performance alignment to research/innovation focus areas /need and performance specifications</p>	<p>Objective: Provide FutureTECH Certification, if appropriate</p> <p>Inputs: Detailed report on certification package containing T&E data review, vetted research/innovation, focus area document, MNS, AOA, DOTMLPF analysis</p> <p>Output: Determination on granting certification for a potential technology</p>
DHS Sponsor (e.g. First Responder, CIKR stakeholder, etc.)	<ul style="list-style-type: none"> Elicit needs and preliminary requirements from stakeholders (approx. 2-4 months) Communicate with national user associations/organizations Develop Mission Needs Statement (MNS) Conduct DOTMLPF-RGS analysis Ensure preliminary requirements are representative of user community Represent user community as necessary Grants development with DHS customer/stakeholder, if required 		<ul style="list-style-type: none"> Provide input on developmental considerations necessary to conduct effective developmental test plan/TRA 	<ul style="list-style-type: none"> Assist PM/POC as necessary to evaluate efficacy and alignment of performance data to meet/exceed stated research/innovation focus areas/needs 	<ul style="list-style-type: none"> End users/customers notified of Certified technologies/capabilities
Commercialization Office	<ul style="list-style-type: none"> Assist in research/innovation focus area drafting by offering requirements development materials Assist in analyzing program prioritization index model (PPI) Assist in analysis of alternatives, technology scans and market scans Continue outreach on “How to do Business with DHS” with private sector Engaged internal and/or external subject matter expert(s)/FFRDC/Non-S&T organization(s) to assist in review of research/innovation focus area document, developmental test plan/technology readiness assessment (TRA) and T&E data Post approved research/innovation focus area document to FutureTECH Program website, if/when approved by FutureTECH Review Panel and Internal Review Router 	<ul style="list-style-type: none"> Provide resources to assist in technology/manufacturing maturity assessments and business analysis Manage incoming applications to posted research/innovation focus area documents Assist with business analysis of potential partners: experience in technology development, business history, likeliness to achieve TRL-6 etc. (approx. 1 week per company) Notify private sector partners of selection or non-selection within one week after decisions are made 	<ul style="list-style-type: none"> Assist PM/POC to develop CRADA and necessary documentation (e.g. SOW, developmental test plan/TRA milestones and deliverables) 	<ul style="list-style-type: none"> Provide resources and materials to develop the criteria necessary for thorough review of developmental test data/TRA Provide recommendation on certification 	<ul style="list-style-type: none"> Assist PM/POC in preparation of certification package New FutureTECH Certified technology/capability marketed by private sector with DHS support, and oversight of Certification mark usage, if approved
PM/POC	<ul style="list-style-type: none"> Collect and support preliminary requirements data/information/documentation articulation from DHS Sponsor Determine alignment to mission needs/capability gaps Conduct an analysis of alternatives (AOA) and research similar efforts Conduct feasibility study with support from subject matter expert(s), if necessary Identify external sources of information (e.g. subject matter expert(s)) Prepare research/innovation focus area document for review by FutureTECH Review Panel and Internal Review Router Ensure conformance/inclusion of any necessary regulation(s) or standard(s) 	<ul style="list-style-type: none"> Establish timeline for application acceptance cycles Conduct due diligence review of potential partners with assistance of Commercialization Office <ul style="list-style-type: none"> Verify current TRL/TRA/MRL of potential technology Analyze likelihood of potential technology to provide desired capability and capability alignment to research/innovation focus area document Recommend future action with potential partners to FutureTECH Review Panel (to be completed within one month of acceptance cycle closing) 	<ul style="list-style-type: none"> Draft CRADA with OGC, Tech Transfer Manager and Commercialization Office (approx. 2-3 weeks) <ul style="list-style-type: none"> Work with private sector partner to determine milestones and deliverables Develop Statement of Work Develop developmental test plan/TRA with private sector partner with input from T&E team Verify TRL-6 maturity is achieved prior to developmental test plan/TRA based on requirements for certification 	<ul style="list-style-type: none"> Provide analysis of capability alignment to stated research/innovation focus area/need Evaluate efficacy and alignment of performance data to meet/exceed stated research/innovation focus areas /needs Communicate questions/comments or clarification needs to private sector partner Provide recommendation on certification 	<ul style="list-style-type: none"> Prepare and present to FutureTECH Review Panel the supporting documentation in certification package and provide recommendation for certification, if appropriate
FutureTECH Review Panel*	<ul style="list-style-type: none"> Ensure preliminary requirements alignment and priority to overall mission objectives based on MNS, EHC, Capstone IPT Capability Gap Review DOTMLPF-RGS analysis and AOA Accept or decline initial package from PM/POC into FutureTECH Program prior to reviews by Internal Review Router 	<ul style="list-style-type: none"> Confirm PM/POC analysis of potential private sector partner Approve/Recommend course of action with potential partner(s) to PM/POC 	<ul style="list-style-type: none"> Review documentation and provide approval on CRADA and appendices Authorize final approval of CRADA Approved CRADA signed by Director – S&T Transition and private sector partner 	<ul style="list-style-type: none"> Review analysis from PM/POC and T&E team to ensure that all data verifies TRL 6/MRL 7 compliance, alignment to research/innovation focus area document and that performance meets or exceeds published vendor specifications 	<ul style="list-style-type: none"> Review certification package and recommendation from PM/POC Make final decision on certification of a given technology/capability
Internal Review Router**	<ul style="list-style-type: none"> Review technical merit of research/innovation focus area document accepted by FutureTECH Review Panel: Are preliminary requirements testable, measurable, specific, achievable and solution agnostic? Express opinions with recommendations to FutureTECH Review Panel Ensure preliminary requirements alignment and priority to overall DHS stakeholder mission 				
Subject Matter Expert(s)	<ul style="list-style-type: none"> Review technical merits of research/innovation focus area document accepted by FutureTECH Review Panel: Are preliminary requirements testable, measurable, specific, achievable and solution agnostic? Ensure preliminary requirements are representative of user community Provide insight into any similar efforts and leverage existing information/research 			<ul style="list-style-type: none"> Provide input on developmental considerations necessary to conduct effective developmental test plan/TRA 	<ul style="list-style-type: none"> Provide analysis of capability alignment to stated research/innovation focus areas/needs
Third Party Independent T&E Team	<ul style="list-style-type: none"> Review technical merit of research/innovation focus area document: Are the preliminary requirements testable, measurable, specific, achievable, feasible and solution agnostic? 		<ul style="list-style-type: none"> Assist in reviewing developmental test plan/TRA to include measures of reliability, safety, and quality assurance Provide input on technical considerations necessary to conduct effective capability testing Provide recommendation on necessary DHS participation during developmental test plan/TRA Review and modify developmental test plan/TRA as required prior to inclusion in CRADA 	<ul style="list-style-type: none"> Validate T&E performance data meets/exceed stated specifications Ensure test results and procedures followed developmental test plan/TRA Pose questions/comments to PM/POC to relay to partner Provide assessment of whether research/innovation s focus areas/needs are met 	
Deliverables	<p>Deliverables: (Typical Time Frame: 4-6 months)</p> <ol style="list-style-type: none"> Written report/brief by PM/POC justifying participation in FutureTECH program including MNS, DOTMLPF-RGS analysis, AOA and research/innovation focus area document is to be distributed and reviewed by FutureTECH Review Panel (approx. 3-6 months) Research/innovation focus area document review and feedback loop to confirm accuracy, feasibility and level of detail of preliminary requirements performed by FutureTECH Review Panel and Internal Review Router (approx 3-4 weeks for initial reviews) Preliminary developmental test plan/TRA procedures and potential performers considered Approved research/innovation focus area documents will be posted online to the FutureTECH Program website by the Commercialization Office Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 2 Months)</p> <ol style="list-style-type: none"> Management of interest and questions from potential private sector partners offering their capabilities to the stated focus areas/needs by Commercialization Office and PM/POC. Conduct detailed analysis of potential technology and manufacturing maturity levels and review business standing of potential partners Select private sector partners that demonstrate ability to deliver required capabilities timely and effectively Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 1-2 Months)</p> <ol style="list-style-type: none"> Work in close collaboration with selected private sector partners to develop CRADA, SOW, developmental test plan based on proposed technology Formalize developmental test plan plan/TRA and determine T&E sponsorship and responsibilities PM/POC to oversee and monitor progress of private sector partners to achieve milestones and deliverables PM/POC and Independent T&E team to observe/oversee T&E as necessary Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 3-4 weeks)</p> <ol style="list-style-type: none"> The results of performed T&E are to be distributed to the PM/POC, Independent T&E team and Subject Matter Expert(s) as necessary for detailed review and report on findings of T&E data. Whenever possible, a paper review of T&E data will be used to analyze whether performance to address requirements and meet/exceed stated specifications. FutureTECH Review Panel will review reports written by PM/POC and Independent T&E team to evaluate conformance of performance. Results/Follow up actions will be communicated/coordinated by the PM/POC 	<p>Deliverables: (Typical Time Frame: 2-3 Months)</p> <ol style="list-style-type: none"> The finalized certification package and recommendation for certification prepared by PM/POC to be reviewed by FutureTECH Review Panel Director – S&T Transition analyzes recommendations of FutureTECH Review Panel signs certification, if appropriate Prepare disclaimers/waivers to be signed by private sector partner if certified Publish certification notice on public websites and approved lists, as appropriate.

* **Internal Review Router** consists of: PM/POC, S&T Portfolio Manager, S&T Division Director, Independent T&E team, Subject Matter Expert(s), and Director – S&T Transition (Final sign-off)

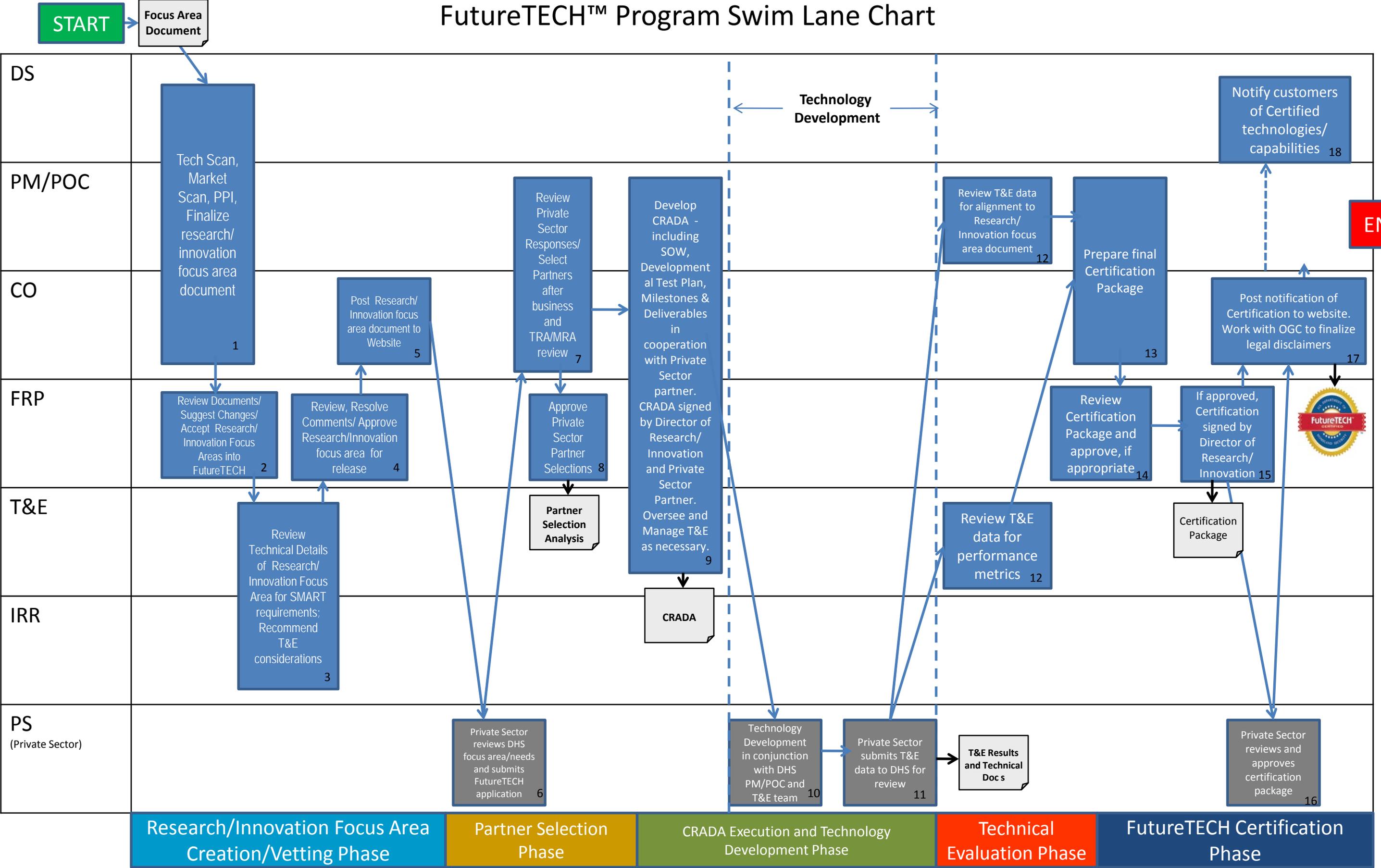
** **FutureTECH Review Panel** consists of: Director - APMD; Director – S&T Transition (Final sign-off); Director – S&T Innovation; Director – S&T Basic Research, Technology Transfer Manager; OGC representative (S&T); Chief Commercialization Officer

Acronym Legend:
DOTMLPF-RGS: Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities – Regulations, Grants, Standards
AOA: Analysis of Alternatives
MNS: Mission Needs Statement

OT&E: Operational Testing and Evaluation
EHC: Enabling Homeland Capability
PM/POC: Program Manager/Point of Contact
TRL/MRL: Technology Readiness Level/Manufacturing Readiness Level
SOW: Statement of Work

CRADA: Cooperative Research and Development Agreement
CIKR: Critical Infrastructure & Key Resources
PPI: Program Prioritization Index

FutureTECH™ Program Swim Lane Chart



CRADAs: An Overview

In the United States today, many public-private partnerships are based on cooperative research and development agreements (CRADAs). These agreements are executed between federal government agencies and private sector participants, where both parties work on a mutually beneficial project. Each group applies the resource that they agreed to use, such as personnel, equipment, services, and/or facilities. Though the private sector participant may fund portions of the effort, the government agency cannot use federal funds (i.e., cash) to support the private sector directly. The partners are able to share information and leverage each others' technical expertise, ideas and information in a protected environment.

The benefits of having a CRADA are: 1) the private sector participants are able to take advantage of the government agencies' analytical capabilities; 2) the government agency and the private sector participants can negotiate on intellectual property disposition, such as rights to patents, the protection of information, and exclusive or non-exclusive licensing of inventions or other intellectual properties developed that are made through the agreement; 3) the government agencies and the private sectors participants have the opportunity to develop work and business relationships.

Agency and private participants define a project that would benefit both sectors. If the needed resources are available to perform the discussed project, the representative (usually a program manager) of the public sector makes the final decision about whether they will pursue a CRADA opportunity. Funds are not transferred from the government agency to the private sector participant, so most regulations limiting federal procurement do *not* apply. As a result, the CRADA can be put into practice quickly and with little difficulty.

A CRADA is an extremely useful tool to both the public and private sectors. The private sector can receive property and patent rights for an invention, while the public sector benefits because it does not use any taxpayer money to fund the project and may use information gathered by the agreement.

Transformational Change beyond DHS

While it is gratifying that our commercialization process and private sector outreach programs are being incorporated and mandated by the Department in the forthcoming and updated Acquisition Management Directive (MD 102-01), it is worth noting that our model can be readily extended to and adopted by other agencies in the federal government. Examination of Table 2 clearly shows how the incorporation of Commercialization adds a “valuable tool to an agency’s toolbox” in providing increased speed-of-execution in deploying technologies/products/services to solve problems, as well as provide an increase in the net realizable budget of an agency. In addition, as evidenced by Table 3, the potential return-on-investment (ROI) of these commercialization-based public-private partnerships can yield impressive results.

S&T Commercialization Office -- Four Major Activities

Parameter	Requirement's Development initiative	Commercialization Process	Public-Private Partnerships	S&T Private Sector Outreach
1) Increase speed-of-execution of DHS programs/projects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2) DHS and its stakeholders receive products more closely aligned to specific requirements/needs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3) Increase effective and efficient communication	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4) End users can make informed purchasing decisions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5) Large savings of cost and time for DHS and its stakeholders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6) Increase goodwill between taxpayers, private sector and DHS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7) Provide more opportunities for small, medium and large businesses	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8) Large taxpayer savings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9) Possible product "spin-offs" can aid other commercial markets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10) Promotes open and fair competition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Homeland Security

Return-on-DHS Investment is LARGE!

Table 2. The major activities of the Commercialization Office demonstrate positive results for taxpayers, the private sector and DHS.

SECURE Program – C-ORD	Market Size	ROI
Blat Recipient Autonomous Video Equipment (BRAVE) C-ORD Requirements for a forensic camera deployed in public transportation vehicles to assist in incident cause analysis.	Over 1.5 million units	290
National Emergency Response Interoperability Framework and Resilient Communication System of Systems C-ORD Requirements for a system to provide interoperable communications on a national framework for remote use by first responders.	Over 2,000 units	525
Interoperable Communications Switch C-ORD Requirements for an interoperability switch-based communications system that provides networked communications between any number of agencies and personnel.	Over 230 units	525
Crisis Decision Support Software C-ORD Requirements for a system with a user-centric approach matched with an expansive database of past decisions and a proven method to quickly reach critical decisions in high pressure environments for wide operational use.	Approx. 50,000 units	1023
Blat Mitigation of Fuel Tank Explosions C-ORD Requirements for an explosion suppression system to protect fuel containers. A "fuel container" ranges from fuel tanks found in vehicles, boats or trains to fuel storage tanks at airports, seaports and the neighborhood gas station.	Over 1 million units	727
Integrated Intrusion Protection C-ORD Requirements for an adaptable, scalable surveillance capability that provides automated, real-time protection for a wide range of operational scenarios.	Over 41,000 units	290
Predictive Modelling for Counter-Improvised Explosive Devices (IED) C-ORD Requirements for a system to predict the threat of an IED attack and further data fusion from law enforcement, intelligence partners and other sources to support the common operating picture.	Over 250,000 seats in US alone	870

Assumptions for Conservative ROI Projections:

- > Return on Investment – (Gain on Investment/Cost Savings – Cost of Investment) / Cost of Investment
- > Gain on Investment/Cost Savings – conservative estimate of potential savings of nominally expended R&D dollars at S&T; in general, estimated savings is 75% of given/related FYDS enabling homeland capability (EHC), which is identified through Capstone IPT process
- > SECURE Program – Cost of Investment – 20% of Commercialization Office personnel salary + (10% Other expenses such as OGC, OPA, OOD, etc.); divided by 20 commercialization operational requirements documents (C-ORDs) completed and publically released in given year
- > R&D Funds at DHS S&T – R&D funds do not include labor or overhead (not fully burdened cost of managing program/projects/EHCs)

Note: Return on DHS Investment is LARGE when compared to Angel Investors (4x to 7x) and Venture Capitalists (5x to 20x)

Table 3. The use of Commercialization has the potential to realize significant Return-on-Investment (ROI) values as evidenced by the SECURE pilot program at DHS.

We have shown through the SECURE and FutureTECH programs that the federal government can engage and influence - in a positive way - the private sector by offering detailed requirements and conservative estimates of market potential. The reason that these partnerships are successful is simple and straightforward. Firms spend significant resources in trying to understand market needs and market potential through their business and market development efforts. By offering this open and transparent information, government saves the private sector both time and money while demonstrating its genuine desire to work cooperatively to develop technologies and products to meet DHS stakeholders' needs in a cost-effective and efficient way that benefits the private and public sectors – but also, most importantly, to the American taxpayers' benefit.

Because of its obvious benefits, it is reasonable to examine the possibility of extending the concepts developed at DHS to other federal agencies. Logic dictates that in cases where

operational requirements can be developed across agencies, the size of a given potential available market would increase. It is also certainly conceivable that various agencies across the federal government share similar requirements for products and services. Just as business experts discuss “technology platform” strategies and models, one can envision a detailed requirements document delineating core requirements with additional agency-driven “options” -- analogous to the variety of options offered on automobiles. Just as consumer products are developed with a variety of options (at varying price points), a detailed requirements document could outline all the options required by agencies through a “requirements platform.” Figure 1 shows how an agency like DHS is related to other government and non-government ancillary markets. The following Figure 2 and Figure 3 delineate the diversity of the other DHS stakeholders in the first responder community and CIKR owners and operators, respectively.

Market Potential Template

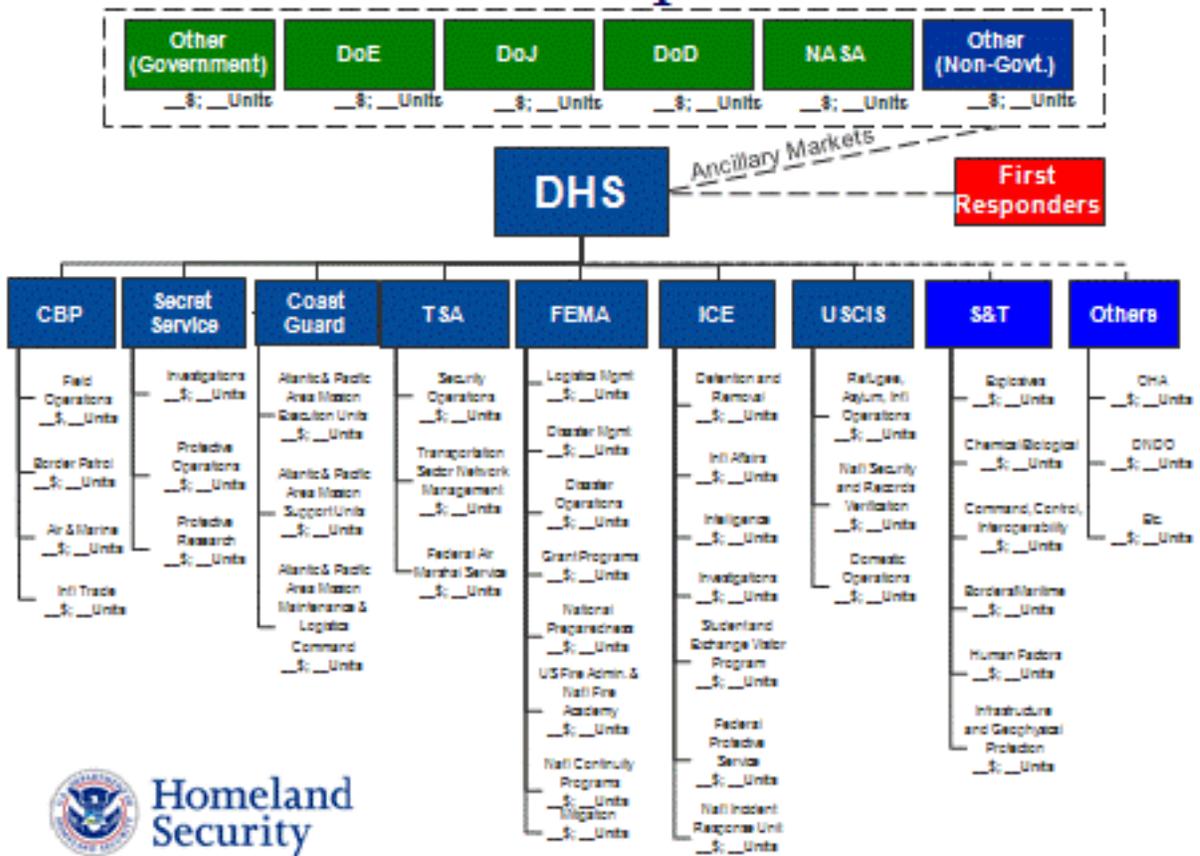


Figure 5 - The Market Potential Template for DHS outlines potential user communities within DHS markets but also to “ancillary markets” represented by other federal government agencies.

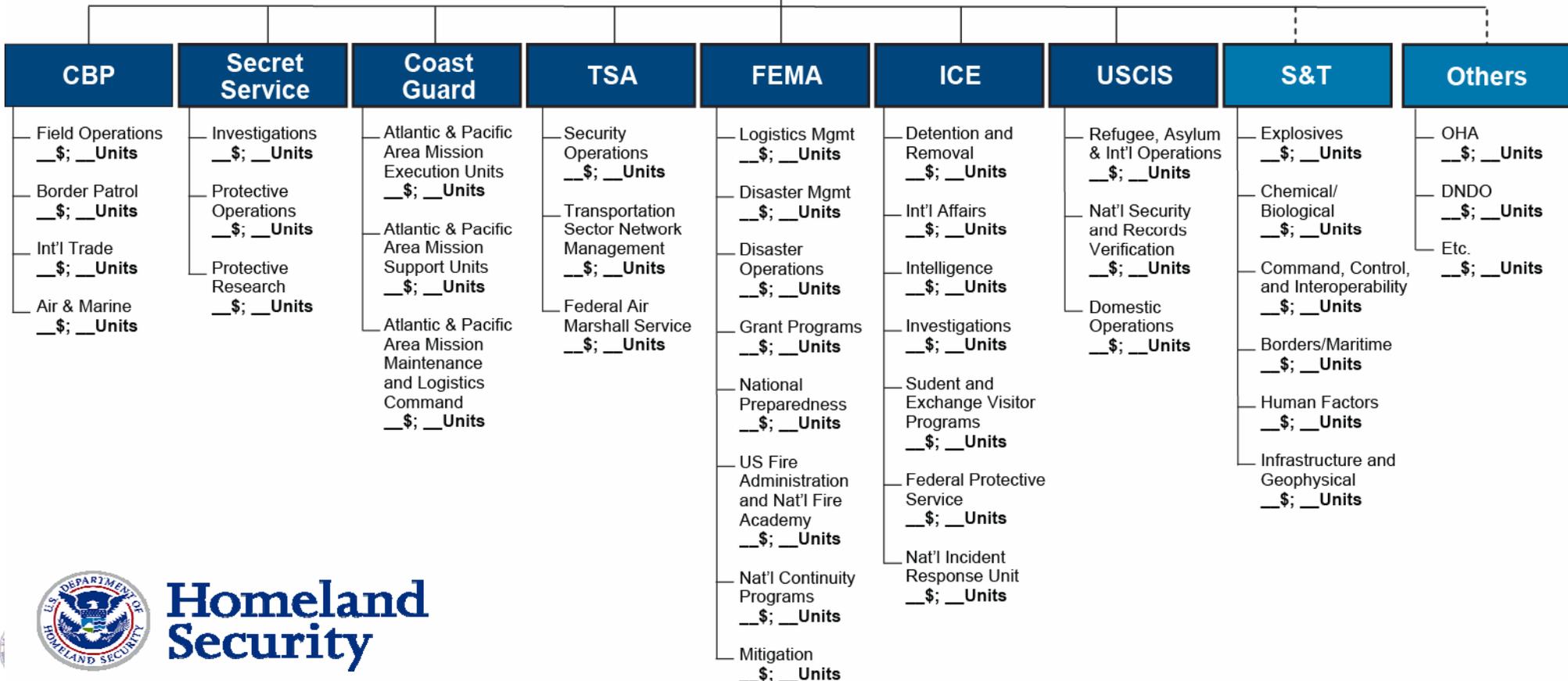
Market Potential Template



DHS

Ancillary Markets

First Responders



Homeland Security

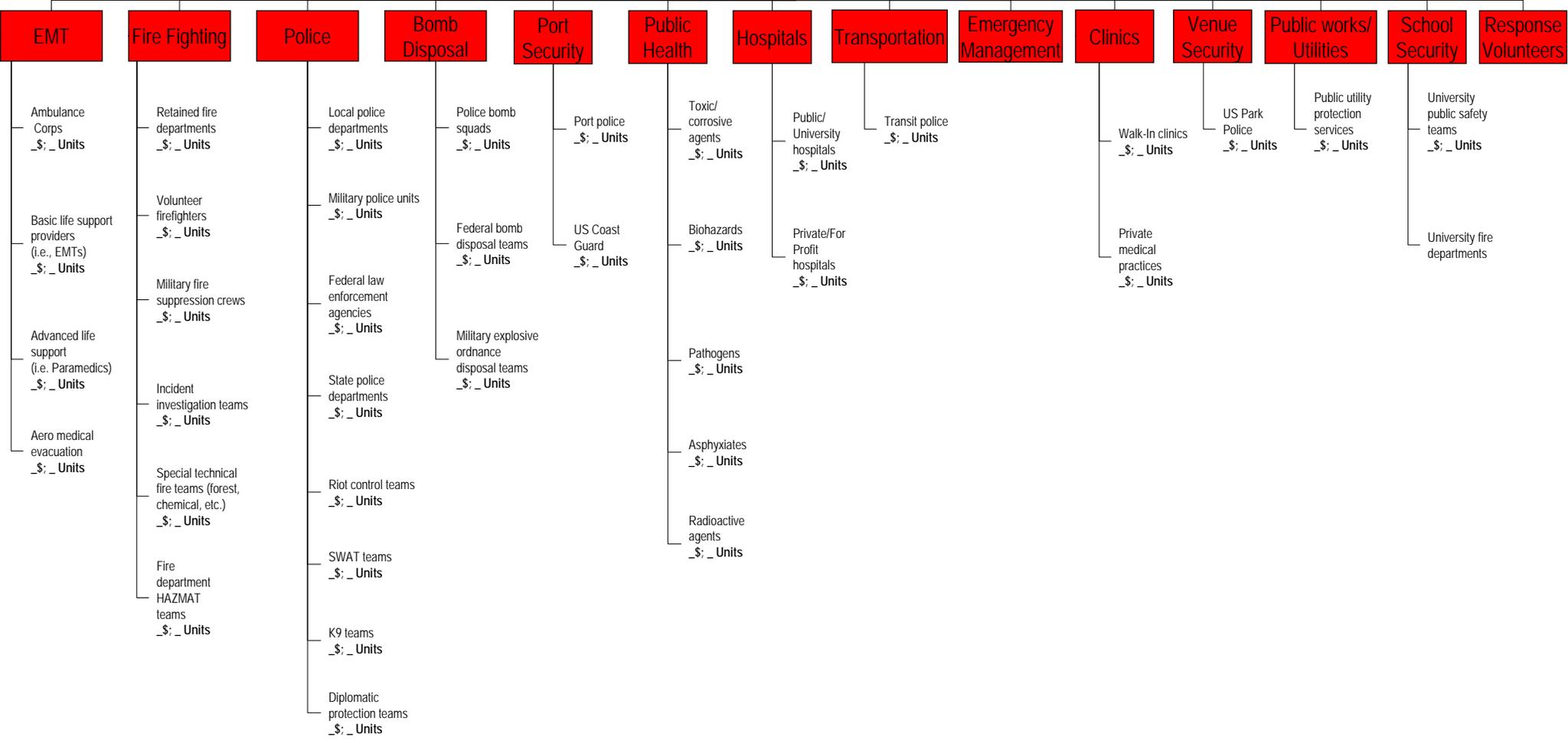
Critical Infrastructure Key Resources (CIKR)

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	Postal 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	Desalinization 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	Marine shipping _\$_; _ Units	Commercial airline _\$_; _ 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	Server and network hardware _\$_; _ Units
Dairy Farms _\$_; _ Units		Wind power _\$_; _ Units	Pharmaceutical _\$_; _ Units	Queuing equipment makers _\$_; _ Units	Merchant banks _\$_; _ Units		Polymers _\$_; _ Units	Museums _\$_; _ Units	Other technical rescue teams _\$_; _ Units	Waste disposal services _\$_; _ Units	Internet equipment manufacturing _\$_; _ Units	Trucking industry _\$_; _ Units	Cruise lines _\$_; _ Units	Subway systems _\$_; _ Units	Display/digital TV _\$_; _ 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	Motor Vehicle manufacturing _\$_; _ Units	Airborne shipping _\$_; _ Units	Distribution services _\$_; _ Units	Long-haul maritime shipping _\$_; _ Units	Software production _\$_; _ Units
Organic Farming/Sustainable Agriculture _\$_; _ Units		Public utilities companies _\$_; _ Units	Medical material providers _\$_; _ Units		Community development _\$_; _ Units		Oleochemicals _\$_; _ Units	Public Libraries _\$_; _ Units	Blood/Organ transplant supply _\$_; _ Units	Protective garment manufacturers _\$_; _ Units	High speed data transmission _\$_; _ Units	Electrical Equipment manufacturing _\$_; _ Units	Trucking _\$_; _ Units	Trucking _\$_; _ Units	Gaming _\$_; _ Units
Traditional Planting _\$_; _ Units		Oil companies _\$_; _ Units	Medical equipment manufacturers _\$_; _ Units		Community banks _\$_; _ Units		Explosives _\$_; _ Units	Amusement parks _\$_; _ Units	Amateur radio emergency comms _\$_; _ Units		Internet service providers _\$_; _ Units	Aerospace product & parts manufacturing _\$_; _ Units	Freight rail service _\$_; _ Units	Freight rail service _\$_; _ Units	Information security _\$_; _ Units
Commercial fishing _\$_; _ Units			Medical technology manufacturers _\$_; _ Units		Savings and Loans _\$_; _ Units		Fragrance production _\$_; _ Units		Public utility protection providers _\$_; _ Units		Print media _\$_; _ Units	Railroad rolling stock _\$_; _ Units	Automobile travel _\$_; _ Units	Automobile travel _\$_; _ Units	Semiconductor equipment _\$_; _ Units
			Biotechnology _\$_; _ Units		Credit unions _\$_; _ Units		Chemical wholesale _\$_; _ Units		Emergency Road services _\$_; _ Units		Internet technology providers _\$_; _ Units	Other Transportation equipment _\$_; _ Units	Roads, Highways, bridges and tunnels _\$_; _ Units	Roads, Highways, bridges and tunnels _\$_; _ Units	
					Insurance companies _\$_; _ Units		Exotic chemicals _\$_; _ Units		Emergency Social services _\$_; _ Units						
					Insurance brokerages _\$_; _ Units				Community emergency response teams _\$_; _ Units						
					Reinsurance companies _\$_; _ Units				Disaster relief _\$_; _ Units						
					Stock brokerages _\$_; _ Units				Famine relief teams _\$_; _ Units						
					Capital market banks _\$_; _ Units				Poison Control units _\$_; _ Units						
					Custody services _\$_; _ Units				Animal control teams _\$_; _ Units						
					Angel investment _\$_; _ Units				Wildlife services _\$_; _ Units						
					Venture capital _\$_; _ Units										



Homeland Security

First Responders



Communities of Practitioners and Dual-Use Technologies

The prevalence of national associations for various homeland security stakeholder communities drives the creation of a significant amount of information relative to the challenges, needs and requirements of their representative membership. Government can play a vital role in communication with these associations to gather this critical information. Sharing this with larger audiences and creating a nation-wide understanding of the problems has increased the awareness and identification of similar requirements in a number of user communities. The more cross-cutting a set of requirements becomes, the more opportunities exist to save taxpayers' resources. How could this be accomplished in a practical way? The answer is simple: It has already begun... DHS Science & Technology Directorate is planning to utilize deployable technology to create a Community of Practitioners (CoP) in order to gather and communicate requirements across such a large-scale community of users.

DoD, for example, has invested in these kinds of technologies. Technology will enable users to reach not only the millions of first responders but also other potentially authorized stakeholders and members of the Homeland Security Enterprise (HSE) (other federal agencies, private sector, venture community, etc). Advanced technologies like the semantic web 3.0 will aid in the communal and open development of detailed operational requirements, potential available market sizing/applications, etc. We are finalizing plans to initiate a pilot program to harness these technologies to engage various user communities to enable broad-based development of widely accepted operational requirements. Figure 4 shows graphically the evolution of developing detailed requirements culminating in the establishment of CoPs. As cooperative partnerships increase between the public and private sector, sharing information becomes the most important tool to improve the effectiveness of the relationship.

CoPs can be developed at a number of levels to gather information from all government stakeholders at the federal, state, local and tribal levels. Open communication can gather information from stakeholders regionally as well as capturing the unique needs of localities that may be large urban centers, widespread townships, or coastal cities, for example. CoPs will enhance connections between personnel in a number of mission-spaces who may find similarities

in capability gaps or share information on best-practices and possible standards that can facilitate coordinated responses to incidents involving users from a number of jurisdictions.

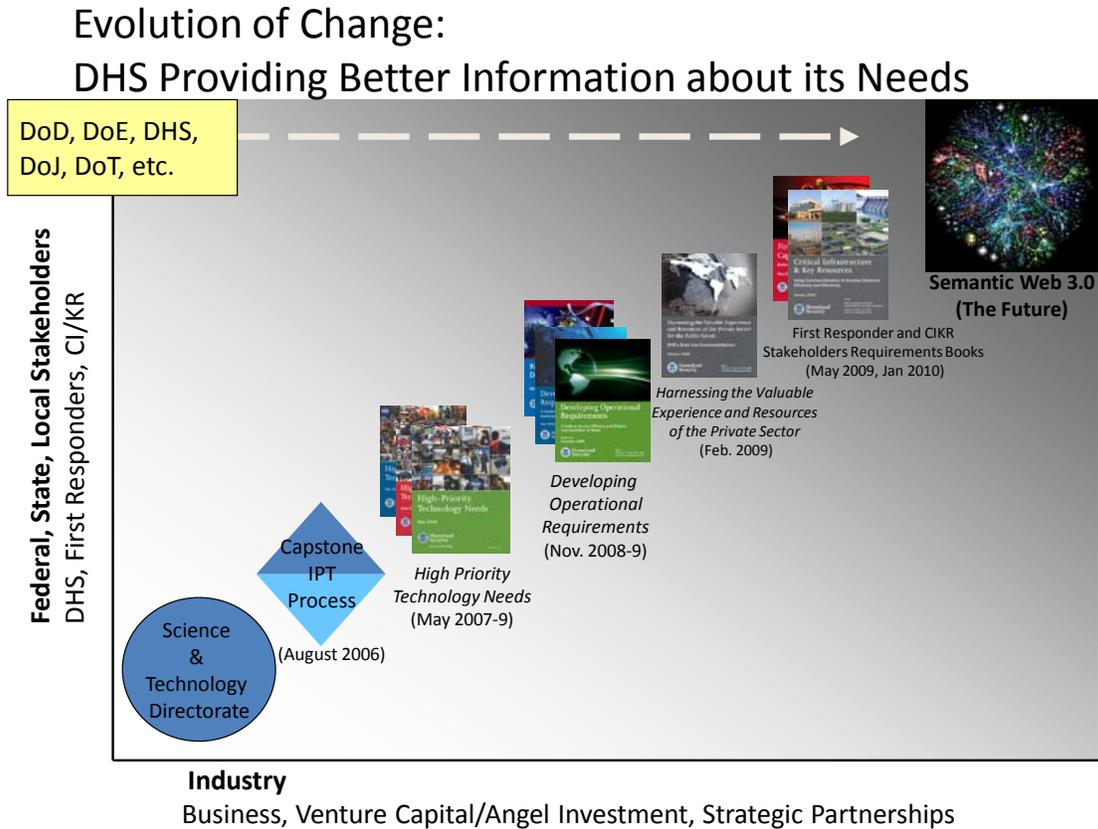


Figure 8. DHS is transforming the way that it reaches out to its stakeholders to learn about their needs. Advanced social networking technologies have the potential to greatly enhance communications and the understanding of needs to allow open and free competition to provide the best solutions at the best price for government.

Uncovering common requirements across stakeholder communities highlights the connections between ancillary markets and the possibility for a technology to work in varied applications. Dual-use technologies provide useful capabilities to a larger market of potential users. It follows that addressing additional markets increases the potential benefits to solution providers who can distribute their company's capabilities to a wider audience, increasing sales volumes and driving prices down for consumers as economies of scale are improved.

Commercialization and partnerships are tools that have genuine value well beyond DHS. In fact, these efforts can offer more and more opportunities to increase the speed-of-execution of government programs and increase the net realizable budget of the government -- all at the benefit of taxpayers the more the models are used both across and within government.

Creating an Integrated Approach: Blending and Coordinating Efforts at DHS

Despite the numerous benefits offered through commercialization-based public-private partnerships, there are instances in which it is not the best method and traditional public-private partnerships are more appropriate. DHS has a number of organizations charged with working directly with the private sector to provide funding, when necessary to spur the development of new technologies, products and services. These organizations and efforts are located throughout DHS and the Federal Government as a whole to allow private sector vendors greater access to opportunities throughout the public sector. The cooperative and complementary nature of these organizations ensures that the right technology, product or service is reviewed by the right people in an efficient manner. The organizations and opportunities listed below cover a wide range of possible means to engage with the public sector including those with grant and funding opportunities as well as other partnership and mentoring programs for small businesses to engage more easily with larger companies looking for strategic partnerships.

U.S. Department of Homeland Security and other Federal Contact Information:

DHS and/or Federal Contact	Description	Contact Information
Private Sector Office	Part of the DHS Office of Policy, the Private Sector Office engages individual businesses, trade associations and other non-governmental organizations to foster dialogue with the Department. It also advises the Secretary on prospective policies and regulations and in many cases on their economic impact. The Private Sector Office promotes public-private partnerships and best practices to improve the nation’s homeland security, and promotes Department policies to the private sector.	http://www.dhs.gov/xabout/structure/gc_1166220191042.shtm
Federal Business Opportunities (Fed Biz Opps)	“Virtual marketplace” that captures the official Federal government procurement opportunities allowing contractors to retrieve services posted by government buyers.	https://www.fbo.gov/
Small Business Innovation Research (SBIR)	SBIR is a set-aside program (2.5% of an agency's extramural budget) for domestic small business concerns to engage in Research/Research and Development (R/R&D) that has the potential for commercialization.	https://www.sbir.dhs.gov/
Small Business Assistance	Provides numerous resources, links and contacts to ensure that small companies have a fair opportunity to compete and be selected for Department of Homeland Security contracts.	http://www.dhs.gov/xopnbiz/smallbusiness/
Mentor-Protégé Program	Designed to motivate and encourage large business prime contractor firms to provide mutually beneficial developmental assistance to small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.	http://www.dhs.gov/xopnbiz/smallbusiness/editorial_0716.shtm
FEMA Industry Liaison Program	Designed to establish strategic relationships with industry partners and stakeholders with access to vendors/contractors; serving as an industry advocate; and acting as the liaison between vendors and the program offices. The IL Program is the portal for all vendors seeking to do business with FEMA. Additionally, small business vendors are routed to the FEMA Small Business Analyst for notification, support and processing. During a disaster, the IL Program has created a process to	http://www.fema.gov/business/contractor.shtm

	ensure that information about your company's products or services is routed as supplemental market research to the appropriate FEMA contracting and acquisition professionals.	
EAGLE and EAGLE II Programs	Department-wide contracts for Information Technology (IT) services and commodities. These procurements are being conducted by the Office of Procurement Operations (OPO) in cooperation with the Chief Information Officer (CIO) and the Component IT and procurement communities.	http://www.dhs.gov/xopnbiz/opportunities/editorial_0700.shtm

S&T Directorate – Homeland Security:

DHS and/or Federal Contact	Description	Contact Information
TechSolutions Program	Established to provide information, resources and technology solutions that address mission capability gaps identified by the emergency response community. The goal of TechSolutions is to field technologies that meet 80% of the operational requirement, in a 12 to 15 month time frame, at a cost commensurate with the proposal but less than \$1 million per project.	http://www.dhs.gov/xfrstresp/trainin g/gc_1174057429200.shtm
SBIR	Please refer to the description above.	https://www.sbir.dhs.gov/
SAFETY (Support Anti-terrorism by Fostering Effective Technologies) Act	Part of the Homeland Security Act of 2002, the SAFETY Act encourages the development and deployment of anti-terrorism technologies to protect the nation and provide “risk management” and “litigation management” protections for sellers of qualified anti-terrorism technologies and others in the supply and distribution chain.	https://www.safet yact.gov/
Homeland Security Advanced Research Projects Agency (HSARPA)	Manages a broad portfolio of solicitations and proposals for the development of homeland security technology. HSARPA performs this function in part by awarding procurement contracts, grants, cooperative agreements, or other transactions for research or prototypes to public or private entities, businesses, federally funded research and development centers, and universities.	https://baa.st.dhs.gov/

Unsolicited Proposals	Composed of several component agencies which handle different types of acquisitions. This Department has several resources, links and contacts if a given small company has products or services which may be of interest to one or more of DHS component agencies.	http://www.dhs.gov/xopnbiz/opportunities/editorial_0617.shtm
University Programs	Office of University Programs engages the academic community to conduct research and analysis, and provide education and training to enhance the Department's homeland security capabilities. University Programs' three thrust areas include: Centers for Excellence; Education Programs; Minority Serving Institutions (MSI) Programs	http://www.dhs.gov/xabout/structure/editorial_0555.shtm

The SAFETY Act: Liability Protection for Anti-Terrorism Technologies

The Supporting Anti-Terrorism by Fostering Effective Technologies Act (SAFETY Act) is intended to provide critical incentives for the development and deployment of anti-terrorism technologies by providing liability protections for Sellers of "qualified anti-terrorism technologies." The goal of the SAFETY Act is to ensure the possessors of such anti-terrorism technologies are not deterred by the threat of liability from developing and commercializing products and technologies that could save lives in the event of a terrorist attack.

As part of the Homeland Security Act of 2002, Public Law 107-296, Congress enacted several liability protections for providers of anti-terrorism technologies. The SAFETY Act provides incentives for the development and deployment of anti-terrorism technologies by creating a system of "risk management" and a system of "litigation management." The purpose of the Act is to ensure that the threat of liability does not deter potential manufacturers or Sellers of anti-terrorism technologies from developing and commercializing technologies that could save lives. The Act creates certain liability limitations for "claims arising out of, relating to, or resulting from an act of terrorism" where qualified anti-terrorism technologies have been deployed.

The Department recognizes that the universe of technologies that can be deployed against terrorism includes far more than physical products. Therefore, the defense of the homeland will

require deployment of a broad range of technologies that includes services, software, and other forms of intellectual property. Qualified anti-terrorism technologies have been very broadly defined to include "any qualifying product, equipment, service (including support services), device, or technology (including information technology)" that the Secretary, as an exercise of discretion and judgment, determines to merit designation under the statutory criteria.

Conclusion

As history shows, public-private partnerships have been integral to the advancement of science and technology for the common good through the efficient completion of tasks and requirements, a decrease in the amount of taxpayer money spent, improvement of government compliance with the environment and working, and the enhancement of the quality of products and services. These prevalent agreements between public and private sector entities have historically involved the public sector funding the private sector to divert its time and resources to address an area without the potential of acceptable return on investment.

The Department of Homeland Security's Commercialization Office has built upon this traditional public-private partnership model to leverage the free market system in order to create commercialization-based public-private partnerships. These partnerships center on the basis that the public sector often represents sizable customer bases for the private sector to warrant investments of time and money. By providing the private sector with detailed, articulated requirements and a conservative estimate of the potential available market, the public sector becomes the "consumer" in this free market scenario.

The SECURE™ and FutureTECH™ programs of the Commercialization Office utilize this commercialization-based public-private partnership. SECURE leverages the resources, experience and expertise of the private sector to develop and deliver fully deployable solutions aligned to the detailed operational requirements of DHS' stakeholders. FutureTECH focuses on the long term needs of the Department, itself, that require the development of new technology. These two programs provide great opportunities for the private sector to "do business" with DHS and to create a "win-win-win" scenario for all participants. With the knowledge of needs and

requirements from the public sector, the private sector is better positioned to align their technology offerings to needed capabilities within the Department and its stakeholders. The public sector benefits from this partnership through the formation of a clearinghouse where the private sector can compete in an open and transparent way for the business of the public sector, which ultimately lowers costs and increases the quality of products and services available for purchase. The taxpayer “wins” because the private sector spends its own money, time and resources on the research and development of technology and products and then sells those products to the government at a competitively low price not only saving the money of the tax payer but also expanding the net realizable budget of the public sector.

The obvious benefits available to the public sector, private sector and tax payer allow for the commercialization-based public-private partnership model through the SECURE™ and FutureTECH™ programs to be a useful “tool in the toolbox” not only for DHS but across all Federal Government agencies to meet the needs and capability gaps of stakeholders in order to protect and secure the homeland of the United States of America.

Many references were used to develop this section. See for example:

- a) Hearne, Rory. "Origins, Development and Outcomes of Public Private Partnerships in Ireland: The Case of PPPs in Social Housing Regeneration." *Combat Poverty Agency* 09/07 (2009). Web.
- b) "John Winthrop, Jr." *Connecticut State Library*. Connecticut State Library. Web. 25 May 2010. <<http://www.cslib.org/gov/winthropj.htm>>.
- c) Link, Albert N. "The History of Public/ Private Partnerships." *Public/private Partnerships: Innovation Strategies and Policy Alternatives*. New York: Springer, 2006. 7-22. Print.
- d) Medalye, Jacqueline. "Support and Opposition of Public-private Partnerships." *Encyclopedia of Earth*. 21 Nov. 2006. Web. 25 May 2010. <http://www.eoearth.org/article/Support_and_opposition_of_public-private_partnerships>.
- e) *The National Council for Public-Private Partnerships*. Web. 25 May 2010. <<http://ncppp.org/>>.
- f) "NETL: Cooperative Research and Development Agreement." *DOE - National Energy Technology Laboratory: Home Page*. Web. 25 May 2010. <<http://www.netl.doe.gov/business/crada/crada.html>>.
- g) "What Is a CRADA? Technology Transfer, Bureau of Reclamation, U.S. Department of the Interior." *Bureau of Reclamation Homepage*. 6 Nov. 2009. Web. 25 May 2010. <<http://www.usbr.gov/research/tech-transfer/crada/whatcrada.html>>.