Summary: Creating an Innovation Hub at Saint Elizabeths (Tasks 1 & 2)
DC Innovation Strategy for Saint Elizabeths

Authored by: Virginia Tech Research Team

Draft Vision for Saint Elizabeths

Build an environment (both programmatic and physical) that encourages entrepreneurial businesses in dynamic and innovative sectors to grow in DC, and allows Federal government agencies to partner with the private sector in support of innovation and commercialization.

Serve as the centerpiece for District-wide efforts to diversify the DC economy and enable DC-based businesses to reduce reliance on Federal procurement contracts and increase their competitiveness in private sector global markets.

Promote DC's existing social and economic assets, and build capacity in under-served communities, to ensure District residents and businesses participate in economic opportunities at St. Elizabeths.

To achieve these goals, the St. Elizabeths Innovation Hub will be a research and technology center that is known globally for innovation and entrepreneurship in technology-based sectors. Although the Innovation Hub will not limit innovation to homeland security technologies, the hub will leverage the presence of the Department of Homeland Security (DHS) to develop model relationships between the public and private sectors in support of innovation. St. Elizabeths will connect the surrounding Ward 8 community to the economic opportunities that are emerging at the Innovation Hub, and provide an array of services to develop links between the community economy and the emerging innovation hub economy.

Summary findings

- DHS is a large but highly diverse organization, which employs more than 26,000 people in the Washington metropolitan area.
- DHS is an anchor institution for the emerging homeland security economy, particularly through procurement of products and services from the private sector.
- New trends in commercialization and technology transfer suggest that DHS may be a relatively innovation- and entrepreneurship-oriented anchor.
- The Washington metropolitan area is the most important location for firms working in the homeland security economy. The District particularly attracts large government contractors specializing in systems integration.
- Total homeland security procurement in the District totaled more than $15.5 billion from 2005 to 2010. Ward 8 businesses near the St. Elizabeths campus have not realized many benefits from procurement in homeland security.
- The District does not show strong entrepreneurial and commercialization dynamics in homeland security (as measured by SBIR and venture capital data).
- The District does not have a technology-based economic development program or organization similar to TEDCO in Maryland or CIT in Virginia.

- Focus group participants believe D.C. has the potential to develop an innovation and entrepreneurship hub at Saint Elizabeths. Efforts should focus on creating an environment that supports these activities generally, not just as relates to homeland security.
- Several cities in the US and internationally provide examples of programs and policies that seek to leverage the presence of anchor institutions (mostly hospitals or universities) to promote community development and economic revitalization.

<u>Detailed findings from our research</u>

The following presents a summary of the results of our research. The following discusses key insights and findings of the various research tasks. The various deliverable reports and memos provide more detailed discussions of these findings.

DHS as an anchor institution

- The consolidation of DHS headquarters facilities at the St. Elizabeths campus provides unique opportunities for the District of Columbia. DHS employs more than 220,000 people across the country. As of April 2010 twelve percent (26,965) of those employees lived and worked in the Washington metropolitan area.

- DHS works closely with the private sector to procure homeland security products and services, allocating over 26% of its 2009 budget for this purpose.

- The DHS Commercialization Office works with the private sector to develop products and services that meet DHS needs. Two programs – SECURE and FutureTech – represent a new approach to commercialization and business development, potentially creating opportunities for cooperation and knowledge exchange in the District.

- DHS' Science and Technology (S&T) unit promotes the development of public-private partnerships. Emerging programs such as the customer-led Capstone Integrated Product Teams (IPTs) may provide DC-based firms and workers with additional opportunities in the homeland security economy. These high-level leadership teams from DHS component agencies work with the S&T directorate to identify the technologies and services their agencies require to achieve their missions and guide investment by DHS agencies R&D activities and contracts.

- DHS' Office of University Programs (UP) oversees three main areas: DHS Centers of Excellence (COEs), Education Programs, and Minority-Serving Institutions (MSIs). Though only two of the Department's 12 COEs are presently located in the Washington D.C. region, there may be opportunities to develop other COEs in the District or the region in the future.
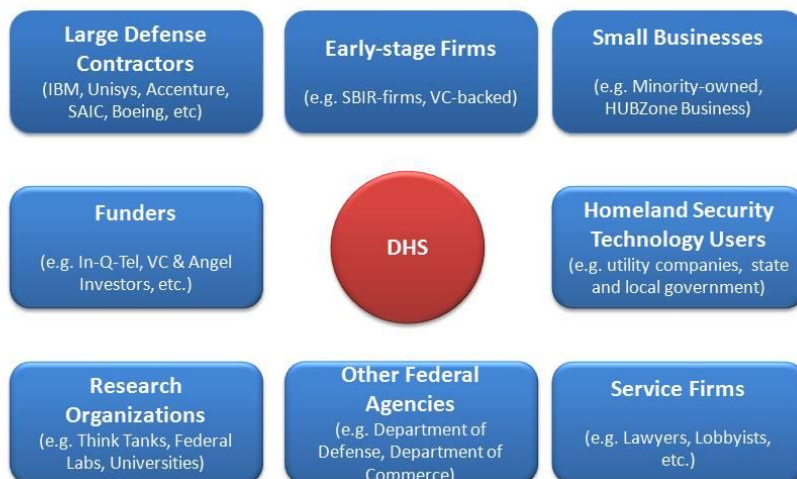
The homeland security economy

- A rather large and diverse homeland security economy emerged over the past several years as a response to the tragic terrorist attacks in 2001. The industry concentrates in a few regions in the United States, and the Washington D.C. metropolitan area accounts for the highest concentration of firms and organizations that provide homeland security products and services.

- D.C.'s homeland security economy consists primarily of large private sector firms that contract with government. These firms have long-standing contractual relationships, with Federal agencies, and often have built on expertise they developed through working with the Department of Defense. Although many serve national or international markets, firms tend to concentrate important business functions and units in the Washington D.C. region, with clusters in Northern Virginia (Fairfax, Arlington) and in the District.

Apart from these large firms, a range of innovative small firms have benefitted from the homeland security economy through investments in their capabilities (either through venture capital or SBIR grants). These firms, however, tend to be spatially distributed across the US, with large concentrations in states like California and Massachusetts. In the D.C. metropolitan area, these firms tend to be in the Virginia portion of the metro area.

- A range of small firms (often also minority-owned firms) benefit from procurement contracts with agencies like DHS for services not related to innovation or new technology.

- The DC region has several other assets that provide support for firms in the homeland security economy and create an atmosphere conducive to their success and growth. These other assets include venture capitalists, think tanks and research organizations, and other federal agencies, as well as service firms such as policy analysts, lawyers, etc.

- Industry experts also note that large institutional actors such as local government jurisdictions, utility companies, hospitals, etc. are important as homeland security product and services users.

Figure 1: Actors in the homeland security economy

- Contracting with the private sector for products and services is critical for DHS. This is indicated by the share of procurement of DHS budget: in 2009, total procurement at DHS accounted for 26.1% of its enacted budget.

- Within the Washington DC MSA, the District of Columbia is the most important location for contractors. Total homeland security procurement in the District amounted

to more than $15.5 billion from 2005 to 2010. The District of Columbia received more homeland security procurement than any other jurisdiction within the Washington DC metropolitan region.

- The District's share of total homeland security procurement in the nation increased from 30.6% in 2005 to almost 42% in 2010, indicating increased concentration of homeland security activity in the nation's capital.

- From 2005 to 2010, federal procurement in the District grew by 14.1% per year (compared to 8.3% for the Washington MSA as a whole and −2.3% for the USA as a whole).

- Firms in the District specialize in high-tech products and services such as consulting services, custom computer programming services, engineering services, architectural services and computer systems design services. Between 2005 and 2010 the District captured the largest share of high-tech procurement (42.6%, $7 billion) in the region, followed by Arlington County (25.3%) and Fairfax County (19.7%).

- The top District-based contractors are large firms that specialize in systems integration and solutions. Typical areas in which firms specialize are: IT services, cyber security, communications systems, border management and security, infrastructure protection, emergency preparedness, contingency operation, and transportation security.

- The District is an important location for minority-owned businesses that contract with DHS. From 2005 to 2010, minority-owned businesses earned more than $11 billion in contracts (14% of total DHS procurement). District-based minority-owned businesses received $2 billion of this total.

Ward 8 relationship to the homeland security economy

- Homeland security contractors performed work in Ward 8 in the amount of $18,013,716. This amount represents only about 0.12% of total homeland security procurement activity in the District of Columbia. Thus, contracting activity in Ward 8 is very low and does not represent a large share of total procurement activity in the District. However, contracting activity in Ward 8 increased annually by about 22.9% between 2005 and 2010, indicating a dynamic economic process.

- Contracting work in Ward 8 was performed in areas related to high-tech products and services such as internet services, electronic and computer manufacturing, information services, and consulting services. Non-high tech related activities such as building construction and security guards and patrol services took place in Ward 8 as well.

- Minority-owned businesses performing work in Ward 8 (but not necessarily headquartered or located in Ward 8) received a total of more than $4.6 million in homeland security procurement contracts between 2005 and 2010. This suggests that the level of entrepreneurship in Ward 8 as it relates to firms capturing procurement from the federal government is low and needs to be strengthened.

- The top 10 vendors performing work in Ward 8 are not located or headquartered in Ward 8. Most of these firms are traditional government contractors, some of which

were acquired by large systems integrators such as Computer Sciences Corporation or General Dynamics. These acquisitions might lead to more concentration in the industry and potentially to more leakage from neighborhoods in Ward 8, unless strategies are put in place to address this.

- The analysis shows that procurement activity in homeland security is not at all concentrated in Ward 8. Over the past six years, some activity has taken place, much of it likely associated with the preparations and start of the construction activities around the new DHS campus on the St. Elizabeths campus.

Perspectives on the workforce

- Over 17,000 of the 27,000 DHS jobs in the Washington metropolitan region are located in the District of Columbia. DHS employment in Washington DC has particularly high concentrations of management, administrative, and security occupations. Management and administrative occupations generally require some vocational training or a 4 year degree, roughly equivalent to Federal personnel grades (GS-levels) 4 and 5 or above. Security occupation training ranges from high school to more advanced technical certifications and degrees. About 93% of DHS jobs are at GS-level 8 or above, requiring advanced degrees and/or several years of experience.

- Many common jobs in industry sectors that support DHS (professional and technical services, administrative services, and education) require only vocational or on-the-job training, and less experience than jobs within DHS. Examples include security guards and 'back-office' occupations such as clerks, secretaries, etc. Other growing occupations, such as IT, require degrees or specialized training. These occupations are prevalent in many regional industries, not only those that may locate at St. Elizabeths.

- Over 50% of ward 7 and 8 residents have a high school education or less. These residents will face challenges in securing jobs in high-skill occupations. Nonetheless, over 20% of the workforce has at least some college credit, and about 50% of the workforce has experience in management/professional or office/sales occupations. Nearly 8,000 residents work in the professional and administrative services sectors.

- DOES and its network of training providers offer occupational training in a variety of career fields, both those that are related to DHS and those that are growing sectors in the region, including IT and office administrative occupations.

- DHS is making efforts to implement hiring procedures that will allow DC residents greater access to DHS jobs, including limited entry-level/apprentice positions, and to develop DHS-related training programs for residents of communities near St. Elizabeths. DHS and DC government should continue to develop strategies to implement educational and workforce training/support programs at the St. Elizabeths campus, which could train residents to work at DHS but also in private companies requiring related occupations.

- Several occupations are common among DHS, private firms that contract with DHS, and regional industry sectors with growing employment needs. Promising areas for growth include security/law enforcement, administrative/office occupations, and computer/IT occupations. Training local residents in these occupations can provide a

range of employment opportunities, both within DHS and contracting firms, as well as in the broader region.

- Many regional training providers offer training for the occupations mentioned above, as well as other services, such as career counseling, assessment and basic 'soft skills' development for job-seekers, and develop customized workforce training programs for businesses to upgrade their current employees' skills. These training providers may fit in well with any workforce development or employment services functions that the St. Elizabeths campus plans to offer.

Entrepreneurial dynamics in the homeland security economy

- The analysis of DHS SBIR data shows that the District of Columbia does not have a competitive advantage in homeland security innovations.

- Since 2004, a total of $142,776,621 was awarded for Phase I and II DHS SBIR projects nationally.

- Firms located in the District have not received any funding from SBIR. Four firms have responded to the solicitations, but they did not receive funding.

- The top 3 states receiving most DHS SBIR awards are: 1. California, 2. Massachusetts and, 3. Virginia.

- Within the Washington D.C. metropolitan region, 51 companies received funding from SBIRs. Most awards were made to firms in Northern Virginia (30 awards) and suburban Maryland (21 awards).

- The District of Columbia is an attractive location for venture capital investment. Between 2008 and 2010, DC-based companies received a total of $188,988,100 in VC investment.

- The DC-based firms receiving venture investments operate primarily in service sectors. Specifically, the majority of firms create products and services for consumer markets. Most prominent are sectors such as digital media and online services. In addition, investments were also made in software and telecommunications.

- The Washington D.C. metropolitan region is home to a variety of venture investors that operate in areas such as homeland security. One of these investors is In-Q-Tel, a CIA organization that combines project funding contracts with business investments and partners with several government agencies, including DHS, to make strategic investments in commercial ventures that deliver promising new technology to the intelligence community. In-Q-Tel, however has not invested in D.C.-based companies. Most In-Q-Tel investments (29) were made in California. This is followed by Massachusetts (12) and Virginia (6). The Virginia-based firms are located in Northern Virginia.

- In contrast to Virginia and Maryland, the District of Columbia does not have a technology-based economic development program. Maryland`s Technology

Development Corporation and Virginia`s Center for Innovative Technology can serve as examples for how states can support innovation and technology development.

University assets and education in the homeland security field

- The District of Columbia and surrounding region are home to many universities, colleges, and research centers with a focus on homeland security. There are four homeland security-related university research centers located within the District. Additionally, there are five centers in Maryland and another six in Virginia. Federally affiliated educational institutions are also present in the District and the region, with two in the District, one in Maryland, and three in Virginia. Northern Virginia is home to two Federally Funded Research and Development Centers (FFRDC). Maryland is home to two DHS Centers of Excellence. The District presently has neither.

- Universities and other educational institutions in the District and the surrounding region have a strong focus on homeland security policy and law. The District's universities and research facilities do not show a strong specialization in technology or other product development.

- Patent activity in general is not very strong in the District of Columbia.

- Community college course and degree offerings in homeland security and related fields are plentiful in the DC metro region. With strong programs developing in the District, Maryland, and Virginia, these institutions could play a vital role in workforce development and educational initiatives related to St. Elizabeths.

- From 1977 to 2010, the number of registered DC patents grew by a mere 1.3% annually. This compares less favorably to neighboring states like Virginia (3.0%) and Maryland (2.2%) and to the nation as a whole (3.7%).

- The District does not show strong specializations in certain patent classes. In contrast, Maryland and Virginia show strong specializations in technology areas that are critical to the economic sectors that are strong in these states (e.g. Virginia in data processing, Maryland in biotechnology).

Insights from homeland security experts (focus group results)

- **Homeland security contractors** see a strong potential for D.C. based firms in contracting with government agencies such as DHS. There is also strength in the intersection of financial opportunities with technology companies and academic researchers. D.C. offers homeland security firms access to government and the ability to influence the national agenda. The area`s highly educated labor force, strong public-private connections, and the general quality of life make D.C. an attractive location for these firms. This focus group sees a major weakness in the obstacles that exist in doing business with DHS. Also, not all types of homeland security facilities and technologies are present in the area. The constant changes in DHS linkages and vulnerabilities, and differing standards for DHS components pose challenges as well. DHS contractors felt that support for innovation has great potential to transform the

way the federal government operates, promote entrepreneurship, and strengthen linkages between the private sector and federal government. To that end, contractors suggested several elements for the St. Elizabeths campus: advanced concepts labs and prototyping facilities; a demonstration 'marketplace' for DHS products and services, and; a conference center at the Saint Elizabeths site.

- The **homeland security education focus group** yielded insights into the strengths, weaknesses and opportunities of the homeland security education sector. In general, homeland security education experts noted that Washington D.C. has a highly educated and skilled labor force in the area of homeland security. There is strong academic as well as R&D expertise, which also benefits from tight linkages between universities and the homeland security industry. The proximity to policymakers and industry experts in D.C. helps with setting up partnerships. However, universities have generally lagged in commercializing their technologies. The lengthy and complicated security clearance process is also seen as a barrier to employment in this industry. Large systems integrators have a huge, often unmet, demand for workers with intelligence, analytics and cybersecurity skills and they are concerned about the availability of qualified candidates. The secondary school system is not prepared for these demands and the education community could be more aware of the skill sets that are needed. There are great opportunities in aligning university programs with labor demands in the industry and to also reach into the lower levels of the educational pipeline. Ideas discussed include: setting up a consortium to support cyber research, creating an incubator for researchers, creating internship programs, establishing a pre-clearance processing service, programs to connect D.C. residents to DHS jobs, co-location of universities to enhance collaboration, education center (modeled after the Army education program at Aberdeen PG).

- The **innovation and entrepreneurship focus group** highlighted D.C.`s strengths in the intelligence and security field, particularly as it relates to technology/R&D capacity, intelligence infrastructure, access to federal government agencies and decision makers, diverse customer base, good universities, robust venture capital community, and emerging models for technology transfer and commercialization. This group saw as major weaknesses the lack of an entrepreneurial drive and a dearth in translation of opportunities into entrepreneurship. They noted the slowness of federal government which does not keep up with the typical entrepreneurial speed. There is also a lack of experienced serial entrepreneurs and investment capital (particularly angel capital). Opportunities were seen in efforts to increase commercialization and entrepreneurship. Ideas included: incubator (but with a broad focus, not just homeland security), test bed, public investment for ventures, partnerships between the SBIR program and the investment community, showcase facility, research consortium, mentor programs, efforts to increase collaboration between firms, entrepreneurs, universities, and the investment community.

Insights from Ward 8 stakeholders (roundtable data)

- W**orkforce development** roundtable participants identified a number of key strengths and weaknesses within Ward 8. Participants noted a number of organizations already working on job training and workforce development initiatives within the

neighborhood, though the top workforce development service providers in the District and in Ward 8 are struggling to maintain operational funding. Participants noted that clearer communication channels regarding funding opportunities and partnerships with DHS and related agencies are necessary, if the community economy is expected to be effectively engaged in this process. Several potential opportunities were identified, including having private sector employers involved in structuring the training programs to meet their needs (ex. William C. Smith property management curriculum), emphasizing work opportunity tax credits to small businesses in the surrounding area, and developing programs that address workforce development issues from a multi-generational perspective (i.e. children, parents, grandparents).

- The **Business Development** stakeholders similarly identified a number of organizations already at work as one of the main strengths of Ward 8. Along with having lots of land available for redevelopment, stakeholders also noted the strength of the neighborhood's transportation network, including easy access to downtown and I-295, two Metro stations, bus lines, and freight rail opportunities. Numerous small businesses were also identified as potential points of contact for outreach efforts moving forward. Significant challenges were also highlighted; namely, that Ward 8's share of jobs in the homeland security industry is presently low and any federal government contract money going to Ward 8 is likely channeled out of the community because the businesses are not actually based there. Business owners suggested: schools with state-of-the-art facilities to prepare students for forthcoming jobs; increased opportunities for small businesses to subcontract with larger contractors, which would require the cultivation of relationships; creation of a minority business development fund; and policies to ensure that small businesses are not driven out when chain stores and larger commercial development happens.

- **Education** providers in Ward 8 described a variety of existing and planned programs that correspond with the emerging needs of the homeland security economy and the St. Elizabeths campus. Notable existing programs include Ballou High School's STAY program (an alternative program with academic and vocational components), Urban Alliance's internship program, among others. Like other stakeholders in Ward 8, educational service providers also confront funding shortages and uncertainties, which has made the stability of many programs a difficult challenge. Additional challenges include below-average educational attainment and higher than average dropout and truancy rates. Service providers in the St. Elizabeths area suggested that non-traditional learning programs and educational pathways are necessary for much of the Ward 8 population. Along those lines, and related to the opportunities at St. Elizabeths, stakeholders suggested: development of a homeland security themed or concept high school; combined studies with on-the-job-training based on Boston's Year Up model; certificate programs for related careers such as emergency telecommunicator/ dispatcher, or Certified Protection Officer; and create opportunities around food services and other essential services on the East Campus.

Insights from the best practice analysis

- The analysis of the case studies illustrates the extent to which regions are proactively developing innovation hubs or clusters. The regions presented in this report leverage anchor institutions such as universities, federal government agencies, military installations, or hospitals. Each region has developed programs and initiatives aimed at building a regional innovation system or cluster (RIS). Only a few regions try to connect with neighboring communities and resident population. The case studies highlight the need for a two-pronged approach: Building an innovation economy on one hand, and embedding this economy in a healthy community on the other. To do this, some case studies highlight the need for bridging workforce development and education programs.

- The following graphic (next page) distills some general findings of the case study and points to key elements that should be incorporated into the blueprint. In this summary, we will also highlight several innovative ideas of how to link the innovation and community economy.
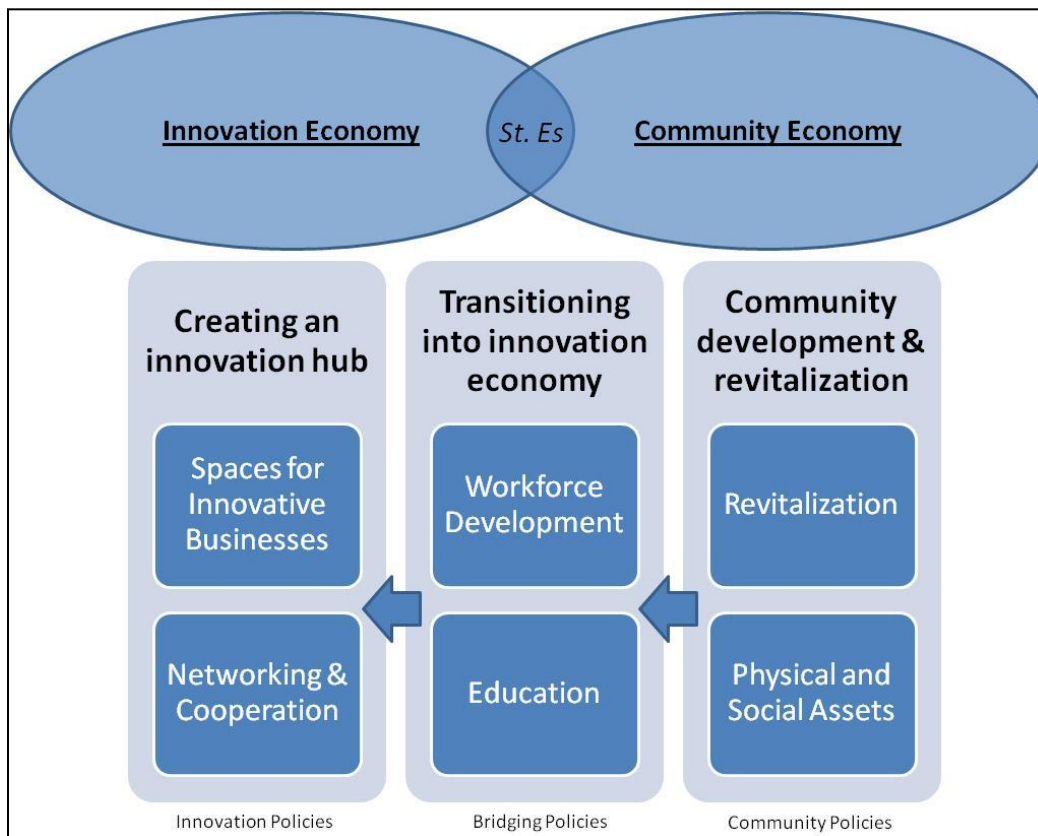
Figure 2: Building an innovation and community economy

Innovation hub principles emerging from our research

Innovation hub actors

- The innovation hub should consist of a variety of actors, including groups and individuals from the surrounding community, federal government agencies, R&D labs, academic institutions, workforce and business development organizations, as well as large and small firms.

- The innovation hub should not focus on one specific industry such as the homeland security industry. Rather, the focus should be open and all types of firms in innovative industry sectors should be included in the hub.

Physical space

- The physical environment should invite interaction and cooperation between the hub actors. Research and technology parks benefit from an environment that is supportive of collaboration. Common spaces such as libraries, community centers, etc. help facilitate these interactions.

- The research and technology hub should utilize mixed-use, high density development which is common amongst most parks in recent years (e.g. NC State Centennial Campus in North Carolina).

- The hub should also include appropriate space and programming for local stakeholders with related interests, including community economic development actors.

- The physical infrastructure and buildings in the innovation hub adhere to the most up-to-date green building standards and the hub will be known as a green and sustainable community.

- The innovation hub should be equipped with the most up to date and secure infrastructure available (i.e. broadband, telecommunication, traffic, etc.).

- The innovation hub will leverage multi-modal transportation networks and the physical environment will facilitate access of the surrounding community.

Management of Innovation Hub

- The success of research and technology hubs often depends on the nature and structure of its management. This should include approaches that would allow for focused, independent, and professional management of the hub.

- While hub management should focus on managing the hub as a physical space, it should also engage in marketing of the hub to external firms and organization, and it should focus on delivering services to hub tenants which in the case of St. Es will likely be very heterogenous, (i.e. large firms such as the systems integrators and DHS contractors, small firms such as the innovative startup companies receiving SBIR or VC funding, and small locally-owned firms).

- Hub management will function as a facilitator of networks and cooperation between the private sector, federal government agencies, academic institutions and local groups and organizations.

Community economic development principles

- Grassroots community organizations, local stakeholders and social service providers as well as other stakeholders should be involved in the planning and implementation of the innovation hub.

- Community economic development efforts need to be people-centered and focused on the citizens of the community.

- The innovation hub should foster an entrepreneurial culture that supports local stakeholders and citizens in the creation of business opportunities.

- Community economic development efforts need to focus on workforce development, business development and entrepreneurship, capital formation and community infrastructure (including housing, social services, etc.).

Technology-based economic development principles

- The District should consider adopting technology-based economic development (TBED) practices. TBED strategies focus on the creation of a knowledge-based economy that leverages investments in the public and private sector.

- While adoption of a TBED approach can provide major transformative benefits for a community it requires a long-term commitment to realize those benefits. Appropriate scaling of public investments and careful phasing of development activities is required to sustain public and leadership support for the most successful projects.

- States like Virginia and Maryland have established technology-based economic development (TBED) organizations that facilitate the growth and development of innovative industry sectors. Creation of a District of Columbia-wide TBED organization would assist the innovation hub in facilitating interaction between federal, private and community actors.

- Technology-based economic development efforts should be coordinated at the regional level and DC-based strategies should connect to region-wide efforts.