

Chattanooga Forward

Technology, Gig, and Entrepreneurship Task Force

March 19, 2014

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Executive Summary

Overview. In late 2013, Mayor Andy Berke launched Chattanooga Forward as a broad strategy for moving the city ahead. He recognized the excellent ongoing work of local leaders by incorporating their efforts into the charge of the Technology, Gig and Entrepreneurship Task Force. This report updates the prior work of the Gig City Initiative with new Task Force deliberations. Task Force members are shown on page 5.

Task Force members took stock of primary lessons learned to date, including successes and milestones. They undertook an analysis of local strengths and weaknesses, and of the opportunities and threats in a larger context of the city's technology, gig bandwidth and entrepreneurship efforts. The following vision, mission and values statements were crafted.

Vision – a better city and a better world because of Chattanooga's unique integration of world class connected technology with a dynamic culture of innovation and entrepreneurship.

Mission – to establish Chattanooga as a hub of innovation, improving people's lives by leveraging the city's digital technology to create, demonstrate, test, and apply solutions for the 21st century.

We believe:

- Information technology and innovation are driving the new global economy
- In working together collaboratively
- Equity and inclusion must be hallmarks of our work
- Chattanooga's unique character and spirit are key advantages for a leap into the new economy.

Recommendations. Responding to the Mayor's charge to determine how to use the city's technology, gig, and entrepreneurship assets in moving the city forward, the Task Force developed a set of recommendations. The primary recommendation is to create an adequately resourced implementation structure to oversee the rest of the work in major strategic goal areas.

- **Implementation.** Create a strong public-private partnership led by a board and executive committee of Chattanooga's most highly placed chief executives and civic leaders across the for-profit, non-profit, institutional, entrepreneurial, and philanthropic sectors. Name a set of implementation committees to work under the board's leadership to chart the course of each strategic goal area described below.

- Innovation Districts. Name an implementation committee to assess the necessary components and partners of a Chattanooga innovation district, its most advantageous locational beginning, and specific steps for creating the first innovation district in a mid-sized city.
- Digital Inclusion. Engage local stakeholders on an implementation committee to create a game-plan for increasing digital inclusion among all citizens and to offer everyone the benefits of an increasingly computer and web based world.
- Applications Development and Testing. Create an implementation committee to rapidly pursue both internal and external opportunities for establishing Chattanooga as the nation's most advantageous place to develop and test the full range of high bandwidth application for 21st century urban solutions.
- Entrepreneurship. Having all parts of a healthy entrepreneurship ecosystem in place is crucial to be able to develop, attract, and keep talent necessary to the new economy. An implementation committee should be named quickly to ensure this ecosystem is strong, flexible and growing in Chattanooga.
- Partnerships. The issues and opportunities at the core of technology, gig bandwidth, and entrepreneurship today are as much national and global as they are local. While Chattanooga has begun to play in larger arenas, urgent attention must be given to ramping up our potential to attract, solidify, and keep new partners in all sectors. An implementation committee should be named swiftly to continue working with existing partners and create new strategic partnerships to further our goals.
- Marketing and Communications. Creating and spreading effective information and messaging about what is going on in Chattanooga are important ongoing functions. An implementation committee of key local stakeholders should be convened to create a proactive branding, social media, and coordination campaign targeting the local public as well as regional, national and international news outlets.

Background Almost four years ago, anticipating the implementation of EPB's smart grid and one gigabit bandwidth service in its 600 square mile service area, a group of local individuals began meeting to explore the implications and economic development advantages of these unique digital resources owned by the citizens of Chattanooga. This informal working group met regularly to share information and to organize on an ad hoc basis to take advantage of opportunities their efforts are rapidly creating.

In 2013 it was clear that without strategic focus and dedicated resources to pursue quickly emerging opportunities, the assets in hand would fail to achieve their full potential. The working group undertook a strategic planning process by inviting other local stakeholders around the table to craft a common mission and short term goals for the Gig City Initiative (GCI). They:

- Reviewed recent accomplishments and lessons learned
- Reviewed missions and goals of the few similar efforts around the U.S.
- Hammered out vision and mission statements and broad three year goals
- Conducted a SWOT analysis
- Set near term priorities for a plan of work

As the new city administration began developing its own approaches for moving Chattanooga Forward, the opportunity emerged to incorporate the GCI priorities into the administration's larger context. The Technology, Gig and Entrepreneurship Task Force of Chattanooga Forward was created to address this context. This report updates the 2013 work on the GCI to take into account these new priorities and to include changing local and national conditions.

Technology, Gig, and Entrepreneurship Task Force Members

(*Co-chairs)

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Kimberly McCormick

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Jack Studer

Brian Trautschold

Roy Vaughn

Tim Walsh

Ron Harr

George Yu

Lessons Learned

Primary successes to date:

- The infrastructure exists, is fully deployed and successful
- GIGTANK, CoStarters, CoLab Accelerator and the other entrepreneurial events organized by CoLab, Lamp Post Group and others generated significant positive attention
- An ecosystem to support start-up businesses is activated, including angel capital, mentorship programs and technology/entrepreneurial meetups
- Rebranding of the city with its digital assets has begun
- Practical applications are being created, including big-data applications
- Relationships have begun with highly influential national partners such as the NSF, the White House Office of Science Technology Policy and US Ignite.
- Earned media through proactive public relations efforts has reached more than 500 million people since 2010 including placements in the *New York Times*, the *Economist*, CBS Morning News and more than 150 other major media outlets.

Key lessons learned:

- Without strong focus and leadership we will fall behind and miss opportunities
- We need actual practical demonstrations and applications of the digital assets to help people understand
- More capital, talent and other resources are needed for investment in digital start-up businesses
- The assets have significant publicity, branding and selling potential for the city, and we must target the right audiences
- The effort needs to connect to more people locally and be diverse in its outreach
- Innovation is a key economic driver in the technology and start up sectors

Vision, Mission, and Values

Any organized effort for the city to take full advantage of its digital assets and resurgent culture of innovation and entrepreneurship must be guided by a common vision for our future, a mission for day to day guidance, and a set of shared values to serve as a bedrock foundation for community efforts.

Vision - a better city and a better world because of Chattanooga's unique integration of world-class connected technology with a dynamic culture of innovation and entrepreneurship.

Mission - to establish Chattanooga as a hub of innovation, improving people's lives by leveraging the city's digital technology to create, demonstrate, test and apply solutions for the 21st century.

Values - We believe

- Information technology and innovation are driving the new global economy
- In working together collaboratively
- Equity and inclusion must be hallmarks of our work
- Chattanooga's unique character and spirit are key advantages for a leap into the new economy

Analysis of Strengths, Weaknesses, Threats & Opportunities

As part of the planning process, stakeholders identified the strengths and weaknesses of GCI efforts to date, and the threats and opportunities in the external environment that will impact its ability to be successful. The prioritized list is below.

Strengths

- Ethos, spirit and can-do attitude of Chattanooga
- The deployed high fiber network, and its time advantage
- An entrepreneurial culture and motivated risk-taking approach to the effort
- Local partners
- National partners

Weaknesses

- No clear leader organizing the overall GCI
- No showcase to illustrate what we have and lack of demonstrable examples
- Lack of diversity among the initial stakeholders
- Lack of high bandwidth connectedness to other gig communities

Opportunities

- To be a place for research and experimentation
- Potential for industry, education, and community connection
- Leadership in meta-data science
- More local company leaders available
- High capacity connections with other cities
- Low cost of local operations

Threats

- Local education capacity and quality
- So far ahead as to make it difficult to demonstrate our advantage
- Talent gap for entrepreneurial start-ups and expansions
- Lack of trained workforce and workforce development
- Lack of outside capital
- Other cities progress in a competitive manner

Strategic Goal Areas and Recommendations

An examination of global and national trends, recent research and policy development, and hands-on knowledge at the local level helped inform the creation of the following strategic goal areas and recommendations of the Technology, Gig, and Entrepreneurship Task Force. Of primary importance is establishing an implementation structure adequately equipped and charged with moving goal focus areas forward.

Implementation. Perhaps the greatest weakness associated with local efforts to ramp up and promote our advances into the innovation economy is the lack of an effective and adequately resourced entity to lead and manage our efforts. All efforts thus far have been largely reactive, ad hoc, and driven by disconnected opportunities or crises. The potentially broad and deep benefits of a coordinated technology, gig, and entrepreneurship strategy are too great to leave to chance.

Chattanooga's two decades of success in turning a dying downtown from an earlier era into one of the most heralded urban come back stories is instructive in this regard. What made these efforts successful were crafting a long term common vision for the city, creating buy-in from all key sectors in the community, top level leadership of all those sectors coming together to problem solve and implement bold ideas, and a spirit of confidence and risk taking in the face of a changing global economy. This is needed now.

It is recommended that a public private partnership be quickly created anew or by re-focusing an existing compatible partnership, to lead the Gig City Initiative. This will require active and regular participation by Chattanooga's most highly placed executives and civic leaders across for profit, non-profit, institutional, entrepreneurial, and philanthropic leaders.

Once an organizing structure, staffing, and a board of directors and executive committee are in place, a series of implementation committees should be created to move efforts ahead as quickly as possible in each strategic goal area below. (See graphic as Appendix C) For example, a top level group of public and private leaders should begin meeting rapidly to determine the necessary components and best location for the creation of an innovation district. This could entail one or more scoping trips to other districts, and use of outside advisors to help guide the work. Due to work accomplished so far, all implementation working groups could come together quickly, create strategically focused implementation plans and have results to show well before the end of 2014.

While the strategic goal areas below represent the most current assessment of opportunities and priorities, they are not meant to limit the ability to respond quickly

and creatively to new situations. Few things are changing more rapidly than the subjects this Task Force is addressing. It will be important to build in structural flexibilities to create additional ad-hoc working groups or implementation committees in addition to those indicated below to react quickly to new opportunities that will most likely arise. The executive board will serve as the guiding coalition on addressing other opportunities.

Innovation Districts. Cutting edge research and early stage experience in a hand full of cities around the world indicate that creating a culture of innovation so necessary to the economy of tomorrow goes hand in hand with creating urban innovation districts. Notable case studies include Boston and Pittsburgh in the U.S. and Barcelona, Spain.

Chattanooga either currently has, or has a high degree of potential to establish all the key component of an innovation district. With regard to high speed internet it has an advantage unique in the U.S. As quickly as possible, local leaders should focus on how to turn our existing assets toward the creation of the first innovation district in a mid-sized city.

An innovation district builds a city's creative and idea based businesses by designating a location encompassing higher education institutions and public and private sector industries such as science and technology to attract entrepreneurs. The goal of innovation districts is to grow the knowledge economy through cross-disciplinary partnerships. The connection of people, ideas, and capital in innovation districts turns entrepreneurial activity into job growth and economic stability. For a listing of common key themes of innovation districts, see Appendix B.

Digital Inclusion. Existing income divides in the US are growing and being reinforced as the nation rapidly shifts to a knowledge based economy. Success in school, in the workforce, and in the ability to access all types of knowledge, services and goods will be dependent on how individuals thrive in a world of computers, the web, and new technology. Chattanooga will only be successful in this new economy if we focus effective efforts on increasing digital inclusion among all citizens and offering everyone the benefits of an increasingly computer and web based world.

Having our distinctive high bandwidth asset is only the first part of the equation. That bandwidth must be broadly available in schools and in public facilities such as parks and community centers as well as in homes of those at all income levels. This will require additional investment in equipment and in staff training in all sectors to be able to take full advantage of high bandwidth resources. People of all ages will need

programmatic supports to help them use this asset to their own benefit at work, in community gathering places, in school, and in the home.

Cities around the U.S. are exploring how to reduce the digital divide as a way of reducing the income divide but progress is limited. This is just the type of challenge – and opportunity - that Chattanooga has the ability to undertake. With an all hands on deck approach in the spirit of the much noted “Chattanooga Way” significant strides can be made in this high bandwidth city to turn what could be a reinforced digital divide into an effective way of bringing opportunity for success to everyone.

Applications Development and Testing. Chattanooga and a few other cities have had modest early success in exploring practical applications for high bandwidth services. What sets Chattanooga apart is its most important application to date – the smart grid. The city’s opportunity to learn from and practice with some initial applications has been crucial. We have learned the most important thing is how to use the bandwidth in practical applications to improve quality of life and to drive innovation of all kinds.

Employing our local high bandwidth assets to drive innovation and economic change can be approached internally and externally. An internal focus – inventing the future around us in our own schools, workplaces, and institutions- is possible because we have the hard infrastructure in place and we are building human infrastructure, in particular through entrepreneurship support, to create our own living application laboratory.

An external focus, by engaging existing and new national partners to bring applications here to test, can create an environment in which a full range of high bandwidth applications can be tested and improved here that would not be possible in other cities. Because we have local partners such as a public school system, medical centers, colleges and universities, an area business association and local government services, we offer external players access to real life systems and opportunities for application testing and experimentation. This will take a top level, coordinated approach among local leaders to reach out nationally. We can offer here a laboratory like no other for application development while also providing the kind of high quality of life attractive to those in the knowledge-based economy.

The full range of vertical markets is available for internal and external testing and development. The most prominent local opportunity areas include advanced manufacturing, medical, smart grid, education of all kinds and levels, and public services.

Entrepreneurship. Innovation and entrepreneurship are widely recognized as the drivers of the new global economy –right down to Main Street in small town USA. Drawing on our heritage of innovation and entrepreneurship of the late 19th century, Chattanooga is making important new strides in developing local entrepreneurs and attracting others to relocate here. Having pieces already in place such as higher education, business incubators and accelerators, low cost high bandwidth, angel capital, low cost of living, and high quality of life positions us for big next steps. Hoping it will all come together is not enough in an economy hungry for entrepreneurs so we will need to build on existing local efforts in a deliberate and generous way, with all sectors working together to get and stay ahead of the pack. All parts of a healthy entrepreneurship eco-system must be in place. Additional investments such as those suggested below can accelerate Chattanooga as a place for entrepreneurs:

- Working with local schools to add computer science to middle and high school curricula.
- Easily accessible public transportation within the city, connecting green spaces, the university, housing and centers of innovation.
- Adequate and reasonably priced housing in the City Center
- Incentives for developers to build at least 150,000 sq. ft. of entrepreneur friendly space
- Improving connections with higher education research centers and outside sources of capital
- Making meeting space available at low or no cost to entrepreneur groups looking to form new meet-ups.
- Developing a public lab space that all entrepreneurs can access for a reasonable price

The key to all of these is to have the entrepreneurs involved at the start. Without their involvement and buy-in these efforts will not reach their full potential.

Partnerships. Experience gained in the past several years indicates we are capable of developing national partners interested in our high bandwidth and smart grid assets. We need to be more strategic about maximizing the partners we have and developing new ones to our best advantage. Some of the most important partnerships to date include the National Science Foundation, US Ignite, the White House Office of Science and Technology Policy, Mozilla, and the Annenberg Innovation Laboratory at the University of Southern California. Each new partner gains us access to others.

We have made the most headway with national governmental or non-profit partners but have just begun to scratch the surface of a larger range of potential partners. These opportunities fall into several categories.

- Major Corporations. Partnerships with Alcatel-Lucent, Cisco, Warner Brothers, and IBM have been fruitful but can be leveraged to grow the number of corporate partners exponentially. It will take a focused and aggressive strategy to do this.
- Gig Cities. The few U.S. cities and towns with some gig bandwidth service could benefit greatly from a coordinated way to share knowledge and experiences, and from the creation of working partnerships, especially as some type of inter-city high bandwidth connection may become possible. Current partnerships exist with Kansas City, Cleveland, OH, and Burlington, VT among others.
- National Foundations. National Foundations such as the Ford Foundation are increasingly taking interest in how technology is changing and can be made to change the world. These foundations base their work in advanced initiatives and talent at the local level and we should work to be part of this level of conversations.
- Colleges and Higher Education. Our initial higher education partners and many more around the country are rapidly building their own abilities in technology, gig bandwidth, and entrepreneurship and are more aware of the value of local partnerships to help do this. Our local assets make us competitive in attracting higher education partners in a new way and we will do well to take more advantage of these types of partnerships.

Marketing and Communications. Significant accomplishments have been registered for Chattanooga thus far with regard to press coverage of its gig, smart grid assets and entrepreneurial programs and this coverage was possible because of intense efforts at the local level. This kind of momentum is difficult to maintain and requires constant updating, strategizing and investment, particularly with regard to branding. The potential benefits of continuing to push a focused and professional brand and supporting messaging are significant. This must be a coordinated effort involving all sectors of the local economy. It will reap benefits to tourism, business, higher education, to talent recruitment and retention, to corporate investment, real estate investment, etc. translating into an improved quality of life, economic development, and job creation. Chattanooga has an important 21st century multifaceted story to tell and should have a branding, marketing and communications strategy that helps build the case at home and to those around the globe.

Accomplishments and Milestones

Category 1. Chattanooga's EPB Smart Grid and Gigabit Bandwidth Service

Smart Grid. EPB is a city owned electric utility company. In planning for better service to homes and businesses in its 600 square mile service area the decision was made to do a massive upgrade to the electric distribution system. This smart grid deployment was fully complete in late 2012. The smart grid consists of fiber-based communications infrastructure connecting automated switching equipment and advanced metering systems that greatly increases reliability and quality of overall electric service delivery. In just one measure of improvement, EPB's smart grid has reduced outage durations by 60%, saving local businesses and industry an estimated \$45 to \$60 million due to increased operating efficiencies and automatic switching devices of the system. Data is now being gathered by the system will make even further advances and efficiencies possible.

EPB Fiber Optic Service – the Gigabit. Development of the Smart Grid required an advanced digital fiber optics communications system. This system also supports fiber TV, phone, and internet services for area customers. The availability of this package of communications services was launched in late 2009, offering the base customer Internet speed of 15 mbps. In September, 2010 – a year later, EPB announced to the nation that Chattanooga was the first city in the country to offer one gigabit speed to customers as part of the smart grid deployment. By this time the base customer speed had been increased from 15 to 30 mbps at no additional cost to the customer. (One gig is 200 times faster than the average US broadband speed.)

Two more speed advances followed. In September, 2012, EPB increased the base customer speed from 30 to 50 mbps, again at no cost increase. A year later in September, 2013 came another gift to the community – an increase of base customer speeds from 50 to 100 mbps at no additional cost and a drop in the cost of gigabit speed to \$70 per month from \$300 per month the previous year.

Category 2. Programmatic Initiatives in Chattanooga

Gig City <http://www.thegigcity.com/> , <http://chattanoogaigig.com/> Realizing the primary mission of EPB is electric service, not promotion of high bandwidth, civic and business leaders organized a community conversation about the smart grid and high bandwidth service and to explore opportunities to partner and promote the city's digital assets. The Gig City websites were created as part of the stakeholder work funded by Lyndhurst. While the group did not initially have a name for its efforts, the

name evolved into Gig City as part of the marketing of the first GIGTANK in 2012. The term Gig City Initiative (GCI) is used interchangeably with Gig City in this document.

- Briefings. Core stakeholders hosted a set of briefings for local community leaders and stakeholders to increase awareness of the assets and to generate ideas for how to leverage it for economic development and public benefit. Over 200 people attended these over a four month period and helped spread information and ideas to the broader community.
- Thought Leader Visits. Stakeholders rapidly reached out to high bandwidth industry thought leaders around the country and found little awareness on their part of the city's assets. Some of those visiting Chattanooga as a result of these efforts included representatives from the Institute for Local Self Reliance, Intelligent Communities Forum, CISCO, Alcatel-Lucent, US Ignite, the National Science Foundation, the Annenberg Innovation Lab, and Global Environment for Network Innovations (GENI), the U.S. Department of Education, the Mozilla Foundation, and the White House Office of Science and Technology Policy.
- Press. Gig City stakeholders led by the Chattanooga Chamber and EPB worked to attract national and international press attention to the story of Chattanooga's smart grid and gigabit service. The Wall Street Journal, The Economist, the New York Times, the Washington Post, and Financial Times, and CBS are just some of the widely recognized outlets that generated more than 150 articles and mentions with a world-wide audience of more than 500 million people. A particular highlight was a discussion of what Chattanooga has accomplished with the gig by Thomas Friedman in a column written after his visit to the city in late 2012. <http://www.thegigcity.com/blog/press/>

CO.LAB is a local private non-profit organization serving as the figurative front-door for entrepreneurs in Chattanooga.

- GIGTANK 2012, 2013. Led by CO.LAB, and assisted by Lamp Post Group and Gig City, local and national partners planned and hosted two groundbreaking gig enabled entrepreneur accelerators. The competitive accelerators are for entrepreneurs with a vision of building next generation businesses and services on fiber and taking them to market right away. The first GIGTANK was held in summer 2012 with eight teams, and the second with seven teams a year later. Team composition is international and multidisciplinary.

- Other Entrepreneurial Support. In addition to the cycle of GIGTANKs, CO.LAB provides year round offerings of entrepreneurial support, helping to build the local entrepreneurial ecosystem. It is an official LAUNCH TN accelerator, funded by the state of TN to foster start-up businesses. Over 700 companies have graduated from CO.STARTERS. 30 active high potential start-ups have emerged through CO.LAB. It organized or facilitated 119 individual entrepreneurial events during 2013.

Angel Capital Initiatives. The Chattanooga Renaissance Fund (CRF), Blank Slate Ventures, Lamp Post Group, The Jump Fund, and other angel and venture capital funds are now active in the city and gearing up to play a crucial role in providing promising ventures with the capital needed to grow and be successful. CRF began in 2010 and has invested \$2.49 million in 26 start-ups, 13 from GigTanks. These companies are now valued at \$50.5 million.

Chattanooga Area Chamber of Commerce INCubator. The Chamber Foundation operates the INCubator at the Hamilton County Business Development Center as one of the nation's largest and most successful business incubation programs in the United States. The 125,000 square foot former-manufacturing space houses about 70 early-stage companies, which participate in a three-year program of intentional business development before "graduating" into the open market. In aggregate, the current INCubator companies are a major employer, which provides jobs to 350 people.

Each year, the INCubator graduates about 20 companies that employ 100 or more people, so the program is continuously supporting the growth and development of small businesses that employ a significant and every increasing number of people in family wage jobs. The INCubator also promotes business innovation and the growth of technology-oriented companies such as current INCubator participant Variable Inc., the maker of NODE+ and recently graduated Coulometrics, a maker of cutting-edge batteries and super capacitors.

INCubator participants have access to administrative and office support. The Tennessee Small Business Development Center, which has offices in the INCubator, provides a business library, computer and video centers, and business counseling services to all area small businesses.

Hackanooga. In September 2012, Chattanooga hosted a unique partnership event with Mozilla and US Ignite, a 48 hour marathon programming weekend that challenged participant teams to create next generation applications to take advantage of the city's gigabit internet speed. Dozens of computer/internet professionals from around the US took part. Prototypes created during the event had the potential to enter the

Mozilla Ignite Challenge, with \$500,000 seed money and mentorship available to help get the apps off the ground.

Gig- Lab/Application Demonstrations. The most effective way to illustrate the value of high speed networks is to actively demonstrate new applications made possible by the network resources. The range of applications is unlimited but Chattanooga has focused on developing apps that provide broad public or economic benefit, such as for public education, increased operational efficiency, health care advances and quality of life improvements. These demonstrations help increase awareness of the city's digital assets and create a living laboratory for application developers. Demo Days have been integral parts of both GIGTANKS, Mozilla Ignite events in Chattanooga and Chicago, at Hackanooga, and at a large public festival in Chattanooga.

City of Chattanooga In addition to supporting the recent transformation of the Chattanooga Public Library, the City of Chattanooga has launched two potentially far reaching efforts to engage city government in the digital economy.

- Startup CHA is modelled after successful initiatives found in cities throughout the country, it offers local government and city infrastructure as a platform for start-ups to pilot new products and ideas. A single point of entry for entrepreneurs expedites the process and makes City Hall more business friendly, while helping the City provide the most effective and efficient services to citizens.
- Open Data and Code for America Brigade. Chattanooga's commitment to make its data available for public and entrepreneurship efforts was given a significant boost in 2013 when local and national foundation funding was made available to match city funds to create Code for America Brigade in the city. This nationally competitive fellowship pairs city government with the country's top developers and designers. The three fellows are working with city government to develop open-source Web apps for city services and other innovations.

Chattanooga Public Library – The Chattanooga Public Library is in the midst of a 21st century transformation, and receiving national acclaim for its efforts. This modern library is now a more valuable public resource, acting as a community workshop, a hub filled with the tools of the knowledge economy. The library still has books, but it also has 3-D printers, laser cutters, sewing machines, and spaces for conducting business meetings. It offers computer coding classes. It has advanced video- and audio-production software. Last year, the downtown Chattanooga public library cleared out its entire fourth floor—14,000 square feet of former storage space—and opened its floor plan for

a community collaboration space. Members of the community can also use the space to work on projects or try to launch a business.

Center Centre The Tennessee Higher Education Commission recently authorized Center Centre as a diploma-granting, post-secondary school. It is a two-year program teaching user experience design (UX). UX designers are key members of teams that deliver websites, web applications, software products, hardware control systems, improved workflows, and thoughtful workplaces. Through collaborative work on real-world projects Center Centre emphasizes developing industry ready graduates. It is a holistic program connecting education, industry, and community to bridge the skills gap between what students learn and what industry and community need.

Category 3. Partnerships and Collaborations

Intelligent Communities Competition. Chattanooga's Gig City Initiative efforts quickly came to the attention of the Intelligent Communities Forum (ICF), a think tank that studies the economic and social development of the 21st century community. The ICF hosts an annual set of prestigious international awards that recognize the world's most intelligent communities based on a set of community indicators. Chattanooga responded to the rigorous application process and in October 2010 was named one of the 21 semifinalists for the award. In January, 2011, the city was named one of seven international finalists. While not advancing past the finalist stage, getting the local infrastructure in place for competing in the process remains valuable and the international press coverage of the city in the process was considerable.

White House Office of Science and Technology Policy (OSTP)/Mozilla Foundation/US Ignite/National Science Foundation (NSF). The most complex and far-reaching partnership created to date has been with four major players in the broadband future of the US. Two are government agencies, White House OSTP and the NSF. NSF funded Chattanooga's Sim Center Enterprises in a round of financing of disaster mitigation projects an ongoing funding possibilities are being discussed. Mozilla Foundation is funded by Mozilla, a non-profit organization and creator of the Firefox web browser dedicated to the internet's openness, innovation and opportunity. US Ignite is a non-profit public-private partnership created in 2011 and designed to make the US the world leader in applications and services for high speed software designed networks. The development of the five way partnership began in late 2010 and continues today.

Chattanooga played an integral role in Mozilla Ignite, an NSF funded challenge to identify new talent to public sector gigabit application development. Three

Chattanooga based developer teams went on to successfully compete in Mozilla Ignite and received funding to work on their applications. One team, Engage 3D (live 3D streaming from the TN Aquarium), received the maximum award of \$50K and demonstrated their application at an international gathering in Chicago in June 2013. Additionally, four of the non-Chattanooga Mozilla Ignite teams demonstrated their applications as part of GIGTANK's 2013 Demo Day in August and these teams are in ongoing conversations about testing their applications in real-life pilot projects in Chattanooga.

Mozilla Gigabit Community Fund. In early 2014 Mozilla launched this new fund with a day-long event in Chattanooga attended by high level officials of the National Science Foundation, U.S. Ignite, and the U.S. Department of Education and GENI. The Fund will disburse a minimum of \$300,000 split equally between Chattanooga and Kansas City for grants to encourage and support minimum viable pilots that demonstrate how gigabit technologies can make a difference in people's lives. The initial focus will be on project aimed at education and workforce development.

Alcatel-Lucent/Cisco/IBM. Alcatel-Lucent (EPB's primary smart grid and fiber vendor), Cisco and IBM have all contributed financial and other resources to Chattanooga's efforts to define the future of high bandwidth cities. They contributed to GIGTANK 2012 prize money, and Cisco donated a \$150K TelePresence to assist with live video-conferencing and other live internet demonstrations between two locations.

Annenberg Innovation Laboratory. Through EPB's leadership, Chattanooga has an ongoing relationship with the University of Southern California's Annenberg Innovation Laboratory. This partnership led to the first high speed musical performance demonstration in the world with T. Bone Burnett in California playing on a virtual stage with Music City Roots performers on an outdoor stage in Chattanooga in October 2012.

Key Common Themes of Innovation Districts

Community Catalyst. Innovation districts are largely developed by the commitment and vision of one key public official who secures the buy-in, investment, and cooperation from other sectors. Mayors have commonly played this role. There must be a convening entity to help promote the district.

Finance and Investment. How district initiatives and projects are financed depends on the funding available in each location and on the focus of the district. Some districts target specific industries such as biomedical or financial, and leverage grants from those industries.

Entrepreneurs. Innovation districts around the world focus on serving the unique needs of community entrepreneurs and link them to opportunity, capital, ideas and other factors important to recruiting and retaining them to the district.

Universities. The presence of at least one college or university is critical to the success of any innovation district. Universities anchor the districts in some cases. Others have different types of university involvement. Higher education brings educated, talented students with great ideas as well as faculty talents.

Connector. Every district has a strong connection to a non-profit that manages and/or connects incubator programs with investment opportunities. Through this agency each district partners with a philanthropic institution. The networking and support it provides distinguishes this district from other parts of the city.

Infrastructure. Innovation districts provide a unique amount of infrastructure to tenants, such as public transit, high speed internet, and multi-modal transportation options.

Housing. Ensuring affordable housing options for young entrepreneurs is essential to the success of an innovation district. Each district offers unique housing options, such as co-housing and live-work spaces to attract entrepreneurs.

Open Space. All types of open spaces are critical components of innovation districts. They create the kind of quality of life essential to attracting and retaining talent, as well as to spur creativity.

