Appendix 3: Digital Economy Planning in Georgia

Background

In 2008 Congress passed the Broadband Data Improvement Act (BDIA) in recognition of the importance of Broadband to the national economy and quality of life to its citizens.

Through the BDIA Act, Congress stated the following:

- (1) The deployment and adoption of broadband technology has resulted in enhanced economic development and public safety for communities across the Nation, improved health care and educational opportunities, and a better quality of life for all Americans.
- (2) Continued progress in the deployment and adoption of broadband technology is vital to ensuring that our Nation remains competitive and continues to create business and job growth.
- (3) Improving Federal data on the deployment and adoption of broadband service will assist in the development of broadband technology across all regions of the Nation.
- (4) The Federal Government should also recognize and encourage complementary State efforts to improve the quality and usefulness of broadband data and should encourage and support the partnership of the public and private sectors in the continued growth of broadband services and information technology for the residents and businesses of the Nation.

Regarding Broadband Planning, the BDIA Act specifies the encouragement of State Initiatives program to establish and empower local grassroots technology teams in each State that would plan for improved technology use across multiple community sectors and create or facilitate in each county or designated region in a State with local technology planning. The teams would have members representing a cross section the community, including representatives telecommunications, labor organizations, K-12 education, health care, libraries, higher education, community-based organizations, local government, tourism, parks and recreation, and agriculture. The plans would benchmark technology use across relevant community sectors; set goals for improved technology use within each sector; and develop a tactical business plan for achieving its goals, with specific recommendations for online application development and demand creation.

In 2009 Congress funded the State Broadband Initiative grant program through the Recovery Act which envisioned a comprehensive program, led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Economic development, energy efficiency, and advances in education and health care rely not

only on broadband infrastructure, but also on the knowledge and tools to leverage that infrastructure.

Since the program's inception, the National Telecommunications and Information Administration (NTIA) awarded a total of \$293 million to 56 grantees. Grantees will use this funding to support the efficient and creative use of broadband technology to better compete in the digital economy. These state-created efforts vary depending on local needs but include programs to assist small businesses and community institutions in using technology more effectively, research to investigate barriers to broadband adoption, innovative applications that increase access to government services and information, and state and local task forces to expand broadband access and adoption.

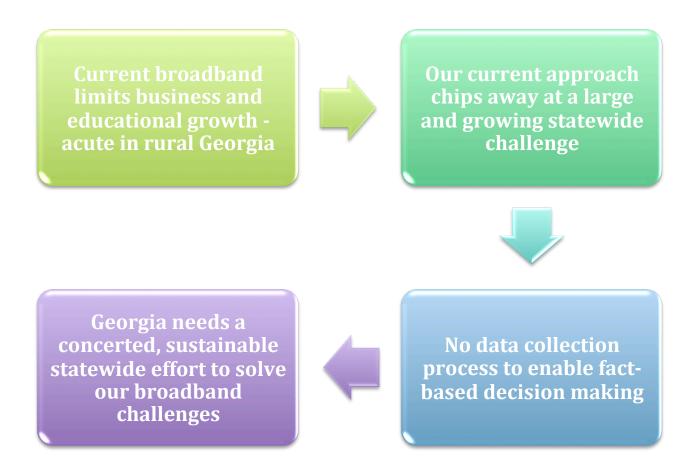
Technology Planning in Georgia

By the late 1800s, forward-thinking citizens of Georgia knew that the State had to improve its technology in order to claim its rightful place in the explosive Industrial Revolution occurring in every corner of the world. As an agrarian society, the State had to work harder and smarter to keep pace with the rapid-fire technical advancements of the day. Fast-forward 100 years, and the State now enjoys a rich modern history of telecommunications excellence, having made strategic investments in technology through the passage of the 1995 Telecommunications Act of Georgia; fiber installation for the 1996 Olympic Games in Atlanta; and construction of distance learning, healthcare and teleconference facilities through the Georgia Academic and Medical System (GSAMS). Atlanta serves as a critical hub for many of the nation's carriers and bandwidth users and hosts some of the largest facilities, infrastructure, and broadband capacity in the United States.

As public and private leadership of the 21st Century contemplates economic development, healthcare, transportation, education, water management, and public safety for future generations, broadband - the conduit of all things - stands above the rest. The importance of its role cannot be understated. Broadband's capacity to literally bring the world to a person's fingertips faster, better, and clearer is the bridge between the industrial revolution of our grandparents and the technological wonders awaiting our grandchildren.

Given the dynamic nature of Georgia's digital ecosystem, there is bound to be debate on how, or even if, Georgia should plan for a digital future. However, worldwide economics and the realities of global competition suggest that strategic, sustainable partnerships will serve as an effective model for driving Georgia and helping it not only compete, but win in the marketplace.

In 2008, the Georgia Technology Authority assessed the Wireless Communities Georgia program and understood the following major broadband barriers in Georgia:



The broadband regional plans will play an important role in addressing this gap. The NTIA- funded Broadband Program at GTA facilitates fact-based decision making through an emphasis on data collection and consensus-based planning.

Governor Deal's vision for Georgia outlines a lean and responsive government that allows communities, individuals, and businesses to prosper. He has set strategic goals for Georgia in areas of education, mobility, growth, health, safety, and government responsibility and efficiency. Broadband (both its effective utilization as well as its supply) plays a critical role in reaching these goals.

Georgia is the largest State east of the Mississippi River with the second largest number of counties in the United States. Georgia leads the southeast in growth over recent years, with almost 10 million residents. The State has a tremendous amount of resources and diversity across major metropolitan areas, mountains, and farmlands. Many private telecommunications companies provide services statewide. In some areas, municipal fiber networks, community fiber networks, and public-private networks have been formed to enhance service and redundancy.

However, the State has not created an overarching Digital Economy or Broadband plan, and it is unlikely that one single plan for Georgia's Digital Economy or Broadband and its utilization for economic development can encompass all of the resources and diversity found throughout the State.

State Priorities

As the regions develop and learn from this planning program for increasing participation in the digital economy, it is imperative that areas of strengths and weaknesses be identified and addressed in the regional plan, particularly in the following key areas that are in line with Governor Deal's strategic goals:

Economic Development: Creating Jobs and Growing Businesses

Capacity, choice, and speed are some of the obvious benefits of expanded broadband. Equally as impressive are the potential opportunities that occur in tandem with broadband access. While rural Georgians have often struggled to gain access to the highest level of education, healthcare, retail and other services, the ability to connect people and ideas at broadband speed provides new opportunities, especially for small business and entrepreneurs.

Broadband enables access to expanded markets, enhances opportunities for current businesses, and provides the necessary infrastructure that attracts entrepreneurs, knowledgeable workers, and technology-based companies that would not have otherwise considered locating in particular areas of the State or the region. Industries in the smallest communities rely on the Internet for customers, suppliers, and product information. Access to adequate broadband services is a critical factor to keeping small businesses in operation.

Some regions have made broadband a cornerstone of their economic development efforts. For example, one area of western North Carolina faced large declines as furniture manufacturing moved overseas. The region was left with extensive capacity and was able to repurpose this capacity to data centers. Now known as the "Data Center Corridor," the area is home to major facilities belonging to Google, Facebook, Apple, and others.

Education: Developing Life, College, and Work-Ready Students

All levels of Georgia's educational system stand to benefit significantly from digital asset enhancement and readiness, including Primary, Secondary, Postsecondary (community and technical colleges, universities) and continuing education programs. K-12 is a particular focus, given the large number of students in attendance as well as the mandate to adopt online testing, curriculum, and electronic textbooks over time. The availability and

adoption of broadband services will enable Georgians to overcome geographical and financial barriers by providing access to a wide range of educational and cultural opportunities.

Public Safety: Protecting the Public's Safety and Security

Broadband technology is particularly important to public safety because it can provide enhanced situational awareness to first responders in emergency situations. Through broadband use, public safety officials and workers can access medical records, site information and other video and data information that can mean the difference between life and death in emergencies. Video surveillance has become a standard tool for many communities large and small. The National Telecommunication and Information Agency (NTIA), the provider of the grant funds making Georgia's regional broadband planning possible, is now working to establish FirstNet, a nationwide 4G public safety wireless broadband network.

Healthcare: Accessible Healthcare

Telemedicine and Telehealth services can vastly improve access to health care in small towns and rural communities. Utilizing telemedicine solutions gives local health care providers and their patients the ability to:

- Consult with specialists.
- Retrieve health records.
- Receive improved emergency response.
- Spend less on transportation costs.
- Take advantage of new alternatives for home health.
- Connect health professionals to their patients in real time.

With the addition of broadband, residents living long distances from medical centers can benefit from the same technology and access to care than their more urban neighbors already utilize.

Addressing the Georgia Challenge

In conjunction with the Georgia Technology Authority (GTA), and funded through the American Recovery Reinvestment Act, the 12 Georgia Regional Commissions are embarking upon a Digital Economy and Broadband planning program. The focus of these plans will be to document both the resources and unmet needs of each region's digital assets, broadband infrastructure, services and related technology utilization and to form on-going efforts to fill identified gaps. The components of these plans should become part of the comprehensive economic development plans for each region.

Georgia Technology Authority's State Broadband Initiative

Purpose of the State Broadband Initiative

Georgia Technology Authority will provide leadership and coordination to further broadband deployment and adoption in the State of Georgia. GTA Staff will coordinate state-level broadband activities, support facilitated discussions with the private and public sectors, collaborate with regional and local governments, evaluate the broadband needs of the State and identify resources to meet those needs. This program will fund three technology summits as well as projects that address technology challenges in economic development, health care and education. The program will develop a statewide Digital Economic report.

Under the American Recovery Reinvestment Act (ARRA), GTA received \$5.2 million for Georgia's State Broadband Initiative for five years of program operation through Dec 2014. The grant funds are designated for the following three programs.

Data Collection, Development, and Mapping

Data collection, development, and visualization are funded to support the identification of broadband capabilities available statewide, community anchor institutions and their network capacity, as well as important information needed to support economic development and government planning. The project develops information and analysis that supports local, regional, and state planning for technology-based applications and services that will benefit business, education, healthcare, and public safety.

State Broadband Capacity Building

The Georgia Technology Authority will provide consistent leadership for broadband development in the State of Georgia. Staff will coordinate state-level broadband activities, collaborate with regional and local governments, evaluate the broadband needs of the State and identify resources to meet those needs.

Local Regional Technology Planning Teams

This program will fund resources needed for the development of the 12 regional Digital Economic plans and will leverage the expertise of the 12 Regional Commissions who will, in turn, partner with local private and public sector stakeholders to develop the plans.

The Georgia Technology Authority (GTA) is partnering with the Department of Community Affairs to provide additional ongoing support resources to the Regional Commissions and their communities to develop their plans. Local and regional data developed in the mapping project will be provided to the Regional Commissions.

Defining Broadband and Its Advantages, Defining the Digital Economy, and Understanding the Connection

Broadband Defined

Broadband refers to high-speed Internet accessibility. In comparison, typical dialup Internet connection speeds (56 Kbps) provide lower data transmission (upload and download) speeds and poor service quality. Dial-up connections typically access the Internet through telephone lines and often require the user to initiate the connection. Broadband Internet services are generally active at all times.

What Is Broadband?

Broadband or high-speed Internet access allows users to access the Internet and Internet-related services at significantly higher speeds than those available through "dial-up" Internet access services. Broadband speeds vary significantly depending on the particular type and level of service ordered, and definitions of the minimum speed of broadband have risen over the last several years. While the FCC used to define broadband at as low as 200 Kilobits per second (Kbps) either upstream (from your computer to the Internet) or downstream (from the Internet to your computer), the current definition is 4 Mbps down / 1 Mbps up. Most residential and consumer-level broadband services emphasize downloads to better meet the surfing and video demands of users, and such services are recognized as asymmetric in their speeds. Businesses often request symmetric service where uploads and downloads are equal in capacity to facilitate server and communication needs.

Many areas of Georgia now support up to over 100 mbps for consumer services with leading fiber to the home providers at 1 Gbps up and down in other parts of the nation. The Federal Communications Commission provides the following information and definitions associated with broadband within the United States.(FCC.gov, 2012)

How Does Broadband Work?

Broadband allows users to access information via the Internet using one of several high-speed transmission technologies. Transmission is digital, meaning that text, images, and sound are all transmitted as "bits" of data. The transmission technologies that make broadband possible move these bits much more quickly than traditional telephone or wireless connections, including traditional dial-up Internet access connections.

Once you have a broadband connection to your home or business, devices such as computers can be attached to this broadband connection by existing electrical or telephone wiring, coaxial cable, or wireless devices.

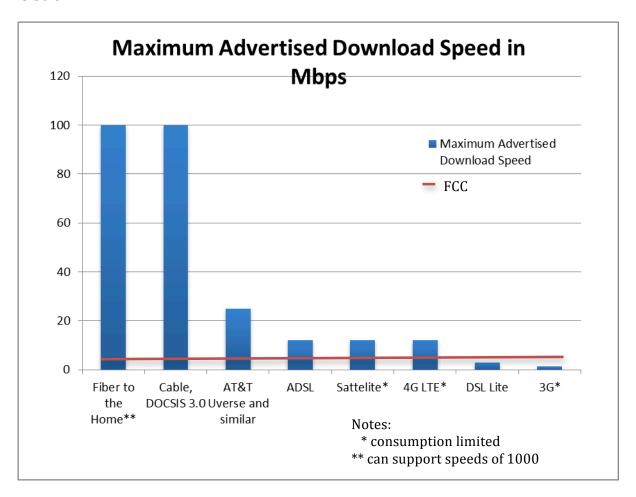
What Types of Broadband Are Available?

Broadband can be provided over different platforms:

- Digital Subscriber Line (DSL);
- Cable Modem:
- Fiber;
- Wireless; and
- Satellite.

The broadband technology you choose will depend on a number of factors. These include how broadband Internet access is packaged with other services (i.e. voice telephone and home entertainment), price and service availability.

A graph describing the typical maximum download performance of the technologies is below.



Digital Subscriber Line (DSL)

DSL is a wireline transmission technology that transmits data faster over traditional copper telephone lines already installed to homes and businesses. DSL-based broadband provides transmission speeds ranging from several hundred Kbps to millions of bits per second. The availability and speed of your DSL service may depend on the distance from your home or business to the closest telephone company facility.

The following are types of DSL transmission technologies:

- Asymmetrical Digital Subscriber Line (ADSL) used primarily by residential customers, such as Internet surfers, who receive a lot of data but do not send much. ADSL typically provides faster speed in the downstream direction than the upstream direction. ADSL allows faster downstream data transmission over the same line used to provide voice service, without disrupting regular telephone calls on that line.
- **Symmetrical Digital Subscriber Line** (SDSL) used typically by businesses for services such as video conferencing. Downstream and upstream traffic speeds are equal. Faster forms of SDSL, typically available to businesses, include **High-data-rate Digital Subscriber Line** (HDSL) and **Very High-data-rate Digital Subscriber Line** (VDSL).

Cable Modem

Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to your TV set.

Most cable modems are external devices that have two connections, one to the cable wall outlet and the other to a computer. They provide transmission speeds of 1.5 Mbps or more. You can still watch cable TV while using a cable modem service. Transmission speeds vary depending on the type of cable modem, cable network, and traffic load. Speeds are comparable to or exceed typical residential DSL.

To find out if cable modem service is available to your home, contact your local cable companies, local cable franchising authority (which may be part of your municipal or county government) or your state's public service commission.

Fiber

Fiber optic technology converts to light electrical signals carrying data and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps. The actual speed you experience, however, will vary depending upon a variety of factors, such as how close to your computer the service provider brings the fiber and how the service provider configures the service, including the amount of bandwidth used. The same fiber providing your broadband can also simultaneously deliver voice (VoIP) and video services, including video-on-demand.

Some network operators (mostly telephone companies) are offering fiber-based broadband in limited areas and providing bundled voice, Internet access and video services.

Wireless

Wireless fidelity (Wi-Fi) is a "short range" technology that is often used in conjunction with a customer's DSL or cable modem service to connect end-user devices, such as PCs, laptops and smartphones, located within the customer's home or business to the Internet. In these cases, Wi-Fi allows users to move Wi-Fi enabled devices around within their homes or businesses without installing additional inside wiring, but the actual "connection" to the service provider is via the customer's DSL or cable modem service. Wi-Fi technology can also be "networked" to provide wider geographic coverage, and when configured this way, may be used by some service providers in offering broadband service. Wi-Fi is widely available in airports, city parks, restaurants, bookstores and other public places called "hotspots," allowing those who are away from their homes or businesses to access the Internet.

Fixed wireless technologies using longer range directional equipment can provide broadband service in remote or sparsely populated areas where other types of broadband would be too costly to provide. Speeds are generally comparable to DSL service speeds. An external antenna is usually required. With newer services now being deployed (WiMax), a small antenna located inside a home near a window is usually adequate, and higher speeds are possible.

Mobile wireless broadband services, such as 3G, are also widely available from mobile broadband service providers, including cell phone companies and others. In addition, many mobile broadband providers are now beginning to deploy technologies, such as Long-Term Evolution (LTE), which promise faster upload and download speeds and wider coverage than 3G technologies, and are upgradeable to full 4G capability in the future. Accessing mobile wireless broadband services may require a special card with a built-in antenna that plugs into a user's laptop computer. Other end-user devices, such as smartphones, already have built-in capabilities. Mobile wireless broadband services have typically provided lower speeds than either wired or fixed wireless alternatives.

Satellite

Just as satellites orbiting the earth provide necessary links for telephone and television service, they can also provide links for broadband services. Satellite broadband is another form of wireless broadband and is particularly useful for serving remote or sparsely populated areas.

Downstream and upstream speeds for satellite broadband depend on several factors, including the provider and service package purchased, the consumer's line of sight to the orbiting satellite, and the weather. Satellite service can be disrupted

in extreme weather conditions. Typically, a consumer can expect to receive (download) at a speed of about 1 Mbps and send (upload) at a speed of about 200 Kbps. These speeds may be slower than DSL and cable modem, but the download speed is still much faster than the download speed with dial-up Internet access. New facilities, scheduled for deployment in 2012, are expected to support consumer broadband services for several million customers at speeds up to 12 Mbps for downloads and 3 Mbps for uploads.

Obtaining satellite broadband can be more costly or more involved than obtaining DSL or cable modem. A user must have:

- A two or three-foot dish or base station the most costly item;
- A satellite Internet modem; and
- A clear line of sight to the provider's satellite.

Both satellite and cellular wireless systems often use consumption-based pricing. What this means is that service is priced not by speed but by the amount of data transferred over a given period of time, typically a month. Over a month, a consumer can often use 4 GB or more on a phone and up to 50 GB or so over a residential system.

What Are The Advantages of Broadband?

Broadband allows you to take advantage of new services not available or not convenient to use with a dial-up Internet connection. One such service is Voice over Internet Protocol (VoIP), an alternative to traditional voice telephone service that may be less costly for you depending on your calling patterns.

Some VoIP services only allow you to call other people using the same service, but others allow you to call anyone who has a telephone number – including local, long distance, mobile and international numbers.

Broadband makes "telemedicine" possible: patients in rural areas can confer online with medical specialists in more urban areas and share information and test results very quickly.

Broadband helps you efficiently access and use many reference and cultural resources, such as library and museum databases and collections. You also need broadband to best take advantage of many distance learning opportunities, like online college or university courses, and continuing or senior education programs. Broadband is an important tool for expanding educational and economic opportunities for consumers in remote locations.

In addition to these new services, broadband allows you to shop online and Web surf more quickly and efficiently. Downloading and viewing videos and photos on your computer are much faster and easier. With broadband you can access the Internet by turning on your computer without needing to dial up your Internet

Service Provider (ISP) over a telephone line, which permits you to use the Internet without tying up your telephone line. As of December 2010, nearly 170 million broadband connections were deployed in the United States.

Digital Economy

The digital economy has been defined as "the network of economic and social activities that are enabled by information and communication technologies such as the internet, mobile, and sensor networks" (DBCDE, 2011). This quote goes to the heart of the economic importance of the digital economy to each region and why participation in the digital economy must be a 'priority at the very highest levels of executive responsibility and strategy.'

Regardless of customer, user or community relationships, communications and participation, cost or asset management, product development, marketing or distribution, the digital economy has broken out of the 'IT' domain to become mainstream business for all. It drives change in economic development by transforming local innovation capacity and competiveness. Commerce is being accelerated by digital and network technology revolutions and the roles of commerce are to exploit and absorb these shocks.

From an infrastructure perspective, the digital economy's information networks are the highways and power grids of the industrial economy. No country, state, region, or community can exploit and succeed without a state-of-the-art electronic infrastructure and skilled workforce supply to support it.

On a global scale, companies and governments can provide 24-hour service as customer requests are transferred from one time zone to another without the customers' knowledge that the work is being done on the other side of the world. The larger the network is, the greater its value and desirability. In Digital Economy, success begets more success.

In the Digital Economy, value is created and shared by the scale of numbers of all members participating on the network. Similarly, because value flows from the scale of connectivity, an open system is more powerful to the participants than in a closed system. The Digital Economy and the global Internet are blurring traditional boundaries between companies, governments, and citizens.

The Digital Economy and Broadband

The digital economy relies upon broadband infrastructure availability, capacity, cost, applications, and services to function. The digital economy, like the overall economy, relies upon key resources such as a supply of skilled workforce and access to capital to function. The impact that broadband has on infrastructure, access, capacity, and cost in any given place or region in the country is similar to the impact of access and capacity on the transportation system in the traditional economy.

Entrepreneurship and the Digital Economy

In addition to focusing on industrial recruitment and support of existing industry for job growth, it has become increasingly important to adopt strategies, particularly in rural areas, that promote entrepreneurship. Data shows that from 1980–2005, firms less than five years old accounted for all net job growth in the United States¹. Georgia already has strength in entrepreneurs and small business, ranking #4 across all states in the ITIF New Economy Index in both economic dynamism and entrepreneurial activity in 2012² and in a variety of good positions among many other indices³.

By focusing on entrepreneurship, rural communities can diversify their local economies and become less dependent on the swings and downturns that affect agriculture, manufacturing, textiles and other rural industries. Entrepreneurs help keep wealth in the local community, and they retain talent. Rural entrepreneurs are more likely to become community leaders and work through philanthropy and volunteerism. According to the Kauffman Center, "entrepreneurial behavior generates many outcomes including stronger civic leadership, better students, more productive workers, and enterprise creators."

A community with strong, growing local businesses is more likely to have a strong tax base both in terms of sales taxes and property taxes. Rooted entrepreneurial ventures typically do not require or even request the kinds of tax abatements that larger outside businesses now demand. For most communities, this strong and growing tax base translates into investments in community infrastructure and quality of life amenities that are valued by entrepreneurs – strong schools, efficient municipal services, libraries, recreation and cultural activities.

The result is a quality of place that is often as important to entrepreneurs as the local business climate. As these entrepreneurs continue to grow in place, generating new rounds of impacts on the local community, a reinforcing cycle is set in motion that creates the kind of entrepreneurial ecosystem found in hot spots as varied as Fairfield, Iowa and Austin, Texas.

Center for Rural Entrepreneurship

As part of this planning process, regions should focus on data collection, stakeholder outreach and planning that identifies strategies to promote entrepreneurship.

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¹ Business Dynamics Statistics Briefing: Jobs Created from Business Startups in the United States, January 2009

² The 2012 State New Economy Index: Benchmarking Economic Transformation in the States, The Information Technology and Innovation Foundation, http://www2.itif.org/2012-state-new-economy-index.pdf

These plans should not limit entrepreneurship to be viewed simply as whiz-kid startups that create the next software to drive the Internet. The growth of entrepreneurship in rural areas may come from "solopreneurs," artisans, crafters, musicians and artists who create new, personalized, original products that can be sold into (relatively) niche markets -- but markets that are large enough to sustain themselves and their families. For example:

• <u>www.Etsy.com</u> is an online marketplace and community of 900,000 creative people around the world. The focus is on handmade, artisan and vintage crafts and goods. Etsy is now a \$1billion company (doubling annually), and 96.5% of the sales revenues are retained by the producers of these goods.

This type of market may actually *favor* rural areas, given their creative culture, highly personalized products -- and combined with the level playing field for distribution that the Internet offers. A check of the Etsy website already lists more than 1,100 sellers throughout Georgia.

- A 2006 study conducted by ACNielsen concluded that "approximately 1.3 million sellers around the world use eBay as their primary or secondary source of income," with an estimated 630,239 in the United States. This type of market promotes peer-to-peer commerce with very lower barriers to entry for rural and regional sellers.
- Crowdfunding sites like Kickstarter and Indiegogo have helped many soloand entrepreneurs raise \$2.7 billion to develop new products of all types in 2012, an 81 percent increase from 2011. This market is expected to grow to \$5 billion in 2013. This type of marketplace opens new doors for rural and regional startups by providing a new source of venture capital in areas where there are no institutional venture capitalists (VCs)

To demonstrate the potential for non-urban areas to exploit trends like crowdfunding, we note that Atlanta has conducted 523 crowdfunding campaigns on Kickstarter (1.24 campaigns per 1,000 residents). Savannah has conducted 420 campaigns on Kickstarter (1.25 campaigns per 1,000 residents). This is despite dramatic advantages that the Atlanta marketplace has in access to capital, proximity to industry, number of educational institutions and so on. Armed only with its creative potential, and new tools like Kickstarter, Savannah was able to level the playing field with Atlanta for access to startup capital.

There are many books, articles, blogs and other sources of information relevant to the goals of growing the digital economy and particularly entrepreneurship. Examples include:

- Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community's Assets, John Kretzmann
- The Rise Of The Creative Class: And How It's Transforming Work, Leisure, Community And Everyday Life, Richard Florida
- Makers, Chris Anderson
- Startup Communities: Building an Entrepreneurial Ecosystem in Your City, Brad Feld
- Who's Your City?: How the Creative Economy Is Making Where to Live the Most Important Decision of Your Life, Richard Florida
- The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, Eric Riles
- What's the Future of Business: Changing the Way Businesses Create Experiences, Brian Solis
- Socialnomics: How Social Media Transforms the Way We Live and Do Business, Erik Qualman
- Tribes: We Need You to Lead Us, Seth Godin