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# NORTHWEST GEORGIA TECHSMART PROJECT

Chattooga, Floyd, Polk, and Walker County

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## PREPARED BY:

Greg Laudeman, Project Manager, 706-271-5521, [greg.laudeman@innovatve.gatech.edu](mailto:greg.laudeman@innovatve.gatech.edu)

Randy Green, Program Manager, (478) 274-3024, [randy.green@innovate.gatech.edu](mailto:randy.green@innovate.gatech.edu)

Nancy Galewski, Blair Garvey, and Andrea Lytle, Research Assistants

## WITH SUPPORT FROM:

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## EXECUTIVE SUMMARY

Information and communications technologies, along with capabilities to use them and facilities to support them, make up a region's information infrastructure. As with more traditional infrastructure, *information infrastructure is essential to prosperity and quality of life. It is even more important than traditional infrastructure for competing in our interconnected global economy.* Essentially, no enterprise can succeed without effectively using ICTs. There are two critical issues that are much more prominent for information infrastructure than for traditional infrastructure.

- ❖ While information *infrastructure is essential to public sector functions* such as education, health, governance, and safety, *it is largely developed and owned by private firms.*
- ❖ *The value of information infrastructure greatly depends on how it is used and how many individuals and organizations use it<sup>1</sup>*, both of which depend upon knowledge and skills.

The implication is that in order to compete and prosper—whether an individual, organization, or region—*it is imperative for us to collaborate with others to develop and utilize information infrastructure.* The Northwest Georgia TechSmart project identified opportunities for just such collaboration, across county lines and lines of business, primarily in Chattooga, Floyd, Polk, and Walker counties, but throughout the region. Based on the input of numerous leaders in business & industry, education, healthcare, local government, and public safety, the Georgia Tech Enterprise Innovation Institute has identified the following priorities:

1. ***Provide full information infrastructure to industrial sites in the region***, such as physical facilities for very high-speed/high-reliability connectivity,
2. ***Close gaps in the availability of ICTs***, including broadband, cellular telephone, land mobile radio, and other forms of telecommunications, particularly those necessary for public safety
3. ***Share software applications and information systems across jurisdictions*** in order to minimize public ICT-related costs while making public agencies more efficient and responsive
4. ***Standardize data formats, web site functions, means for securely sharing critical information*** (examples: medical records, surveillance video), and similar for key sectors, particularly healthcare, local government, and public safety
5. ***Establish ICTs resources for marketing the region***—if just guidelines, standards, and similar—such as podcasting, search engine optimization, wi-fi hotspots, and web portals
6. ***Facilitate awareness of new technology and support adoption of available ICTs*** by organizations within the region, particularly small and medium sized enterprises

This report summarizes the process that Georgia Tech went through to identify and prioritize these opportunities, provides an action plan for executing them, and presents the detailed findings of the project. ***A collaborative and comprehensive approach—with equal attention to demand and supply of ICTs—is most likely to increase employment and investment by ICT-intensive firms, wring the maximum benefits and value from ICTs, and effectively position the region for quality, sustained growth.***

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<sup>1</sup> E-mail demonstrates this fact: It does no good for just one person to use e-mail; there must be at least two users. Ten users are a hundred times better, and one hundred users are ten thousand times better. The value of most ICTs multiplies with each additional user.

## BACKGROUND AND INTRODUCTION

The Georgia Tech Enterprise Innovation Institute (EI<sup>2</sup>) provides the TechSmart service to assist communities and regions develop and utilize their information infrastructure. “Information infrastructure” refers to everything needed to acquire and apply information, including data, software, support, and training, as well as hardware and physical components. Information infrastructure can be very expensive to develop, and it is very difficult to use effectively and fully. It requires a great deal of careful planning and teamwork. Collaboration between private sector firms and public sector agencies is especially critical.

The Northwest Georgia TechSmart project was initiated by leaders in Chattooga, Floyd, Polk and Walker county governments, in partnership with the Coosa Valley Regional Development Center, and with financial support of the OneGeorgia Authority. The goal of the project was to identify opportunities to collaborate on developing and utilizing the region’s information infrastructure, but ***the overall goal is to enable sustained competitive advantage and quality of life for the region’s citizens—individual and corporate—in an interconnected global economy.*** To this end the project focused on five broad sectors:

- Business & Industry
- Education
- Healthcare
- Local Government
- Public Safety

EII considered a wide range of factors in carrying out the project, but two anchored the consideration:

1. The US 27 corridor, which links the four counties, is a transportation route that includes a major Norfolk-Southern rail line as well as a US highway. That rail line hosts a major optical fiber route that connects Chattanooga and Atlanta, to Chicago and Miami, and beyond. The corridor is home to many cultural, historical, and natural assets that draws tourist dollars.
2. The region is centrally located between several major automotive manufacturers, particularly Honda and Kia on the south end and the new Volkswagen plant immediately north of the region in Chattanooga, Tennessee. Other manufacturers include BMW, Toyota, and Mercedes. The region is already home to several major automotive component and vehicle manufacturers, and is leading the Auto Alley workforce development initiative with support from the Governor’s Office of Workforce Development.

***The TechSmart process for northwest Georgia kicked off with four county-level focus groups*** to identify what stakeholders in each of the five sectors felt the region needed in terms of technology, where it was needed, who needed it, and why it was important.

***The second phase of the project involved surveying organizations in the region about how they currently use information and communications technologies*** (ICTs), the benefits of using ICTs, and barriers to greater utilization (more use and more benefits). ***During this phase we also looked globally at “best practices” for ICTs*** in the five sectors, particularly focusing on the automotive industry as our “gold standard” because of its importance to the region and the fact that it is widely recognized as one of the most ICT-intensive industries. We then conducted five focus groups, one for each sector, to review the benchmarking results. This feedback was then integrated into our analysis of the results.

During the second phase we also identified firms that provided ICT products and services in the region, and we identified assets that might be used for providing advanced communications services. The ICT firms were

contacted via e-mail to gather additional information about their products and services, but we received very limited responses. Information gathered in the process is included in the appendices for use in future efforts

***The last phase of the project involved identifying actions or tactics that regional stakeholders might take*** to address perceived needs for additional information infrastructure and tap opportunities for greater utilization of ICTs. These activities were vetted with a group of key stakeholders, representing the county governments, Chambers of Commerce, and economic development organizations, and ranked by those stakeholders. They were also presented to representatives of telecommunications providers that serve the region, who were invited to collaborate with the key stakeholders to grow the availability and use of ICTs.

## ACTION PLAN

1. Formally endorse the Regional Technology Action Plan
  - a. Coosa Valley Regional Development Center board of directors endorse the plan
  - b. County commissioners pass resolutions or take similar action to endorse the plan
  - c. Chambers of commerce boards of directors endorse the plan
  - d. Other entities endorse the plan as appropriate
  - e. Endorsements do not imply allocation of funds, simply commitment to collaborate with others and adopt standards, or similar, where applicable and practical

Metrics: number of endorsements, percentage of county commissions (or sole commissioners) and chambers of commerce endorsing the action plan, ***portions of the plan implemented***

2. Establish a regional technology team
  - a. County governments assign a high-level administrator to participate on the team
  - b. Chambers of commerce and/or development authorities assign a high-level staff member or recruit notable “demand side” volunteer to participate on the team
  - c. Consider formalizing the team—authority, coalition, partnership, task force, etc.
  - d. Invite other private and public sector entities to participate
  - e. Invite ICT providers—the “supply side” companies—to participate on the team
  - f. Set goals and metrics for the team, metrics for the team should generally include benefits and costs associated with using ICTs

Metrics: number of team members, percentage of county governments and chambers of commerce endorsing with representatives on the team, ***initiatives undertaken*** by the team

The team should review and organize around the following tactics as team members and other regional stakeholders see fit. This is not an exhaustive list; the team may identify additional or alternative tactics.

3. Provide full information infrastructure to industrial sites in the region (“Smart Site” program)
  - a. Identify essential information infrastructure elements (see the “Requirements” discussion, below, in the “Best Practices” section)
  - b. Identify and prioritize commercial and industrial sites for inclusion in the program
  - c. Poll ICT providers, particularly telecommunications companies, about facilities at each site, order fulfillment cycle for essential elements, and cost components for these elements
  - d. Identify which elements can only be supplied by ICT providers and which might be supplied by a third party (e.g., fiber ducts, equipment enclosures, antenna towers, etc.)
  - e. Invest in critical elements
    - i. Negotiate letters of intent or similar with ICT providers over third party assets, including letters of intent to use assets not supplied by them
    - ii. Negotiate with public finance entities (Appalachian Regional Commission, OneGeorgia Authority, etc.) to assist with cost of developing and deploying assets
    - iii. Issue bonds and develop other financing as necessary
    - iv. Establish rights-of-way, etc., necessary to install assets
    - v. Design/specify elements, develop and issue an RFP
    - vi. Award contract(s) and oversee construction
    - vii. Coordinate installation

- viii. Manage and maintain assets
- f. Develop a marketing approach/plan to promote the “Smart Sites”

Metrics: sites impacted, level of investment in each site, types of services provided at sites, levels of private and public investments (ratio of the two), ***inquiries about sites*** related to the program, ***sites occupied*** by as a result of the program

4. Close gaps in connectivity (“Dead Spot Task Force”)
  - a. Identify gaps in connectivity
    - i. Engage public safety officers and similar professionals to gather data on cell phone and land mobile radio (LMR) signal strength
    - ii. Survey citizens regarding broadband services
    - iii. Map data
  - b. Dialog with providers about business constraints on closing gaps
    - i. Identify critical assets that may reduce constraints
  - c. Identify public assets that might be utilized to address gaps: Land, rights of way, towers, etc.
  - d. Develop financing and business commitments as appropriate or necessary
    - i. Negotiate letters of intent or similar with ICT providers over third party assets, including letters of intent to use assets not supplied by them
    - ii. Negotiate with public finance entities (Appalachian Regional Commission, OneGeorgia Authority, etc.) to assist with cost of developing and deploying assets
  - e. Develop infrastructure assets
    - i. Establish rights-of-way, etc., necessary to install assets
    - ii. Design/specify elements, develop and issue an RFP
    - iii. Award contract(s) and oversee construction
    - iv. Coordinate installation
  - f. Manage and maintain assets

Metrics: gaps identified (broadband, cellular, LMR, etc.), private and public assets identified to assist with closing gaps, ***service gaps closed***, private and public investments, ***return on investments/revenue generated*** by closed gaps

5. Share software applications and information systems across jurisdictions
  - a. Engage potential partners, particularly city and county governments, public school systems, non-profit partners
  - b. Inventory existing assets (see “Benchmarking” section below)
    - i. ICT capabilities: Skills, support, training
    - ii. Applications: Software components that provide general business functionality
    - iii. Code and data: Software components used by applications to tailor functionality to users’ interests, needs, tasks, etc.
    - iv. Connectivity: Logical connections that enable and secure data acquisition, display, processing, storage, transmission, etc., including analog communications (e.g., LMR)
    - v. Facilities: Hardware and other physical components used in data acquisition, display, processing, storage, transmission, etc., including analog communications (e.g., LMR). Note that radio frequency spectrum is a “facility,” and should be managed as such.
  - c. Conduct requirements analysis for partners
    - i. Create requirements data gathering protocol

- ii. Gather requirements data for each partner
- iii. Aggregate and analyze requirements
- d. Evaluate procurement approaches
  - i. Coordinated purchasing: Partners share information about planned purchase and contracts
  - ii. Partner contracting: Any purchase contract would be negotiated so that partners could purchase under that contract
  - iii. Joint procurement: All purchasing parties provide letters of intent to purchase, individual contracts are negotiated for all, or a single joint contract is negotiated for all
  - iv. Authority representing separate ICT departments: A public entity negotiates independently for all partners after negotiating commitments to purchase with the partners
  - v. Authority merging separate ICT departments: The various information services/information technology departments or functions of the partners are merged into a regional public entity
  - vi. Joint outsourcing: Partners jointly contract for ICTs, effectively replacing their internal information services/information technology departments
- e. Negotiate and execute contracts
- f. Oversee contract fulfillment

Metrics: partners engaged, assets inventoried, common requirements identified, procurement approaches evaluated/selected, contracts executed, value of contracts, increases in utilization, **costs avoided/saved from joint procurement, increases in benefits from utilization**

- 6. Standardize data formats, web site functions, means for securely sharing critical information, and similar for key sectors
  - a. Engage potential partners for all sectors: Business & industry, education, healthcare, local government, public safety, and others (civic, cultural, faith-based, non-profit, etc., enterprises)
  - b. Inventory existing assets (see “Benchmarking” section below)
    - i. ICT capabilities: Skills, support, training
    - ii. Applications: Software components that provide general business functionality
    - iii. Code and data: Software components used by applications to provide functionality tailored to users’ interests, needs, tasks, etc.
    - iv. Connectivity: Logical connections that enable and secure data acquisition, display, processing, storage, transmission, etc., including analog communications (e.g., LMR)
    - v. Facilities: Hardware and other physical components used in data acquisition, display, processing, storage, transmission, etc., including analog communications (e.g., LMR). Note that radio frequency spectrum is a “facility,” and should be managed as such.
  - c. Identify needed or planned ICT investments
  - d. Identify common elements across and within sectors
  - e. Identify and evaluate standards for components
  - f. Select and promote standards as appropriate
  - g. Consider sharing resources in order to maximize benefits of standards (see 5.d., above)

Metrics: partners engaged, assets inventoried, requirements identified, standardization opportunities identified, standards evaluated, standards selected and promotion efforts, costs avoided/saved from

standardization, increases in **availability of and expenditures on ICTs (and ICT-related services)** resulting from standardization, increases in **benefits of ICTs from standardization**

7. Establish ICTs resources for marketing the region
  - a. Identify comprehensive regional marketing mix (products, price, place, promotion)
  - b. Specify ICT opportunities for each component of the marketing mix
    - i. The “Smart Site” program and “Dead Spot” task force both address such opportunities
    - ii. Consider tourism opportunities such as a “start-up kit” for wi-fi hotspots that connect users to a localized regional web portal, a podcasting and/or geo-caching initiative
    - iii. A regional search engine optimization effort is a relatively simple, low-cost opportunity
    - iv. Guidelines or standards for content, meta-data, public amenities, etc., also represent simple, low-cost opportunities
  - c. Develop a plan and identify resources to tap each opportunity
  - d. Promote and coordinate work on opportunities

Metrics: definition of regional marketing mix, opportunities for ICT-supported marketing identified, resources identified and tapped, marketing programs deployed, increases in **inquiries and/or traffic** associated with marketing programs, increases in **business investments and/or revenue** from marketing programs

8. Facilitate awareness of new technology and support adoption of available ICTs
  - a. Review the “Benchmarking Results” section for insights into opportunities for increased technology adoption, including barriers to and drivers of investment
  - b. Consider the following and other demand-building tactics:
    - i. Challenge grants, tax incentives, or low-interest loans for ICT adoption
    - ii. Expertise sharing, in which enterprises with particularly talented ICT personnel would loan them to others on a short-term, targeted basis
    - iii. ICT demonstration projects, in and across sectors
    - iv. ICT presentations to boards, commissions, councils, and other official groups, and at Chamber of Commerce, civic club, and similar meetings
    - v. ICT service-learning or “reverse mentoring” with college students assisting enterprises
    - vi. Regional ICT showcase, including firms from Atlanta and beyond
    - vii. Targeted support for churches and similar organizations that could expose many folks to ICTs
    - viii. Task forces to investigate and report on technological advances in particular sectors

Metrics: technology adoption opportunities identified, awareness- and support-building activities, **number of ICT-related investments or projects** resulting from awareness- and support-building activities, increases in **benefits from ICTs adopted** as a result of awareness- and support-building activities

## TACTICS

Tactics are actions or procedures for achieving specific objectives. In this report, tactics are ways in which leading private and public entities across northwest Georgia might collaborate to develop and utilize information infrastructure to **position the region for quality, sustained growth, to enable sustained competitive advantage and quality of life for the region’s citizens—individual and corporate—in an interconnected global economy.**



They are derived from the needs and priorities expressed by participants, but also from trends and best practices. The key imperatives behind these tactics are:

1. Private enterprises will invest where they can realize maximum return on their investment, where high-quality ICTs, support and training are readily available, and where other private and public enterprises fully utilize ICTs.
2. ICTs should enable users to control and reduce costs, and should be deployed in a manner that minimizes the complexity and costs directly related to the ICTs, as noted above both of these goals can be best achieved via collaboration
3. Processes should be focused on customer value and should be integrated across departments and enterprises for this purpose
4. Products and services should be moved as close to the customer as possible to increase responsiveness and minimize costs, this generally requires ICTs that are highly flexible and mobile
5. The interconnected economy requires ever-increasing bandwidth and reliability, as well as effectively ubiquitous availability of broadband.
6. The tactics are designed to be actionable and fundable. ***Tactics 3 and 4, in particular, are potentially eligible for OneGeorgia Authority BRIDGE funding*** and other state programs. Federal funds may be available through the Appalachian Regional Commission, the Economic Development Administration, the National Telecommunications and Information Administration, and USDA Telecommunications Program.

The tactics in the action plan are broken down into tasks or activities that achieve some portion of that objective, and each tactic has metrics associated (the critical metrics—those directly related to the objective—are bold and italicized). The tactics are intended to be an integrated regional technology strategy for Chattooga, Floyd, Polk, and Walker counties, and possibly other parts of northwest Georgia that supports a comprehensive regional development strategy. For example, while water issues are not directly addressed in this plan the outcomes of the plan should make it easier to manage the region’s water resources, and ICT requirements for that purpose can easily be incorporated as a tactic in the future. ***This plan and the actions/tactics it contains should be seen as a “work in progress” that will change as they are implemented.***

As noted above overall goal is to enable sustained competitive advantage and quality of life for the region’s citizens—individual and corporate—in an interconnected global economy. Needless to say, this is not a goal that any one organization can achieve independently: ***It will require collaboration, commitment, and coordination.*** Thus the initial action should be to establish a regional technology team, anchored by the county governments and Chambers of Commerce. Other private and public sector “user” organizations should be encouraged and welcomed to participate on the team or in executing any of the actions/tactics. The team should have a place for “provider” organizations, with the realization that these organizations have a clear economic stake in the actions and are at least nominal competitors. Therefore it may be best for them to play an advisory or ex-officio role.

**REGIONAL TECHNOLOGY TEAM** – The regional technology team may take several forms, based on the preferences of members and what it seeks to accomplish. The form may evolve over time, and/or the team might spin off other groups with a different form. Some of the forms that the team might take include (“formal” here means with clear, documented, and mutually agreed upon decision-making processes, lines of authority, and governance):

- ❖ Alliance or coalition – A coherent but informal group of entities with common interests that agree to act together. Alliances and coalitions are often, but not necessarily, managed by a not-for-profit corporation.
- ❖ Association – A formal membership organization that exists to represent the interests of its members, typically operated as a not-for-profit corporation.

- ❖ Authority – An autonomous public entity with the ability to raise funds, own property, and/or provide services. An authority must be created by act of the state legislature. Authorities are generally expected to exist in perpetuity.
- ❖ Cooperative – A formal membership organization established for the purpose of jointly purchasing and/or selling of goods, typically operated as a not-for-profit corporation.
- ❖ Corporation – An independent formal organization established to produce goods or services. May be either for-profit or not-for-profit, and must be registered with the state. Corporations are generally expected to exist in perpetuity.
- ❖ Partnership – A formal arrangement characterized by commitment to jointly define objectives, contribute to achieve those objectives commensurate with benefits derived by each partners.
- ❖ Task force – A coordinating body, focused on a particular issue or objective, with little real power except to educate and mobilize others about the issue/objective. Typically with a limited and short lifespan.

“SMART SITE” PROGRAM – The Smart Site initiative would provide one or more partial or complete information infrastructure components to any entity occupying one of the designated sites. These components might include, but are not limited to, high-speed/high-reliability connectivity, software applications and development (including data), data storage and management services, user support and training services, computer and/or network hardware, and value-added network services (e.g., security, VoIP, etc.). Members of the team might provide the services directly, at a discount or pro bono, might purchase them from a third party, or might provide tax or other incentives to defray the cost of the components (based on the number of jobs created or other metric).

“DEAD SPOT” TASK FORCE – Numerous participants noted that broadband, cellular telephone, land mobile radio, and other forms of electronic communication are unavailable or have limited performance in certain geographic locations. The purpose of this initiative would be to remedy this situation and assure 100% availability of current and possibly future communications services. The critical activity would be to identify the locations via some type of survey. This survey could be done directly by public officials—particularly for cellular and radio services—or via a household survey. For the latter, survey distribution, collection, data entry, and analysis are significant tasks. Dead spots, once public identified, might be unilaterally eliminated by private firms. Public investment may provide a catalyst for private investment by service providers in high-cost areas. Or the team might establish some means of directly closing gaps that are not addressed by private firms. Some actions, such as building towers in the center of dead spots, might effectively meet both private and public objectives. The areas that seem to have gaps in one or more forms of communication are:

- |  |   |
|--|---|
| • Aragon                               | • North Ave. (Rome)   |
| • Armuchee                             | • North Cloudland Area  |
| • Cave Spring                          | • North Floyd County  |
| • Cedartown                            | • North Rome  |
| • Chattoogaville                       | • Pepperell   |
| • Coosa                                | • Prior Station   |
| • Esom Hill                            | • Rockmart  |
| • Georgia highway 100 corridor         | • Rossville   |
| • Georgia highway 140 corridor         | • Shannon   |
| • Holland                              | • Taylorsville  |
| • Lake Creek                           | • Teloga  |
| • Lookout Mountain (southern portions) | • Texas Valley  |
| • McLemore Cove                        | • US highway 27 corridor (between cities/around county lines) |
| • Menlo (cellular)                     |   |

- Mountain View
- Wax Community

**SOFTWARE SHARING** – The cost of software can be reduced, and its benefits increased, by sharing it across agencies, departments, and/or jurisdictions. “Software” in this case refers to code, data, and services, as well as compiled applications. Examples include GIS data sets, enterprise resource planning systems, web hosting, messaging services, and electronic commerce suites. Special arrangements, such as joint procurements or group discounts, would have to be made for most commercially published software. But open source software, custom applications, and locally generated data sets could be shared across jurisdictions without third party accommodation. Regardless, such sharing would require a substantial amount of cooperation and coordination, which is nominally the purpose of the regional technology team. If software sharing is seen as an important tactic, the team should be organized in a form that would facilitate this (e.g., as a cooperative, partnership, or similar).

**STANDARDIZATION** – Standardization of data formats, web site functions, security systems, etc., is complementary to software sharing. Indeed, *standardization should be a precursor to sharing*, but standardization creates significant value in and of itself: Standards lower the cost of developing and sharing information resources, and increase the benefits of using information tools. The regional technology team plays a critical role in standardization: cataloging systems, particularly application frameworks, data formats, and connectivity models, finding commonalities, identifying open and proprietary standards, evaluating and selecting standards, collaborating on promulgation of and transition to selected standards, etc. Basically, the role of the team is to find the most usable and useful standards given where stakeholder organizations are today and need to go tomorrow. The primary opportunities for standardization across the sectors covered by this project, based on participant input, benchmarking and best practice findings, appear to be:

- Web application platforms, web site architecture and functionality
- Automatic data collection, including bar-coding, RFID, smart cards, and surveillance
- “Amenity” connectivity methods and locations (how and where folks can get online easily and inexpensively)
- Information security, including archiving, audit trails, and encryption
- Geographic data formats and accessibility
- Electronic commerce services, including auction capabilities and supply chain integration
- Calendar event items, scheduling
- Digital media, particularly video codecs
- “Single login” identity tools, for clients/customers and for personnel, that are portable (e.g., can be applied in business, education, healthcare, etc.) but maintain privacy and allow for users to maintain and secure their personal information

**ICTS FOR REGIONAL MARKETING** – A significant amount of input from northwest Georgia TechSmart participants related to marketing the region, its assets (particularly people/workers, industrial sites, and cultural/historical/natural assets), its enterprises, and their products. In the “marketing mix” ICTs are useful for enhancing products, strengthening position, and promoting awareness without driving an increase in prices. Most of the other tactics discussed here have a clear marketing aspect, particularly the “Smart Site” initiative. The regional technology team should also consider focused efforts to utilize ICTs for regional marketing, including:

- A regional portal that integrates information from existing websites and provides an inexpensive platform for those who don’t have website
- Standardized wi-fi hotspots that require users to login and drive them to a regional information portal

- Blogging, geo-caching, podcasting, social networking, and webcasting tools and training for locals (hobbyists, students, professionals, etc.) to generate content that promotes the region
- E-coupon program that local enterprises, including public sector enterprises, can embed in their websites (for gathering market intelligence as much as drawing in customers)

Note that each of the above regional marketing tactics is complementary to, but could be executed independent of, the others. Each could and should also support other tactics pursued by the regional technology team.

ICT FACILITATION – A major challenge with ICTs is keeping track of how they change and improve. An associated challenge is maintaining the know-how necessary to deploy and use new ICTs. These challenges are particularly large for small- and medium-sized enterprises. They keep us from tapping the full benefits of ICTs, undermining regional competitiveness, and stunt business opportunities for technology firms. At the same time there are knowledge resources, particularly students, that are under-utilized. There are several ways in which the regional technology team might facilitate awareness of new technology and support adoption of available ICTs by organizations within the region.

- Host regular regional technology meetings featuring “cutting edge” presenters, from Atlanta and beyond, targeted at the region’s “digerati.”
- Establish a “speakers bureau” and content for non-technical presentations about technological advances and the importance of keeping up with them, appropriate for civic clubs, professional associations, etc.
- Create a service learning program in which college and high school students help local enterprises with their web sites and other ICTs.
- Engage regional technology firms in a “challenge grant” program for local enterprises that matches their investment in ICTs
- Work with regional news outlets, particularly community newspapers, to produce “tech” columns, publish stories about ICTs, etc.
- Create a regional “answer line” online or via phone that allows people to get some direction and find resources to help with ICTs
- Develop one or more ICT “start-up kits” such as “how to get started with a web site,” “how to get started with accounting software,” “how to get started with databases,” “how to get started with VoIP,” etc.

## PRELIMINARY NEEDS ANALYSIS

We conducted four sessions, convened by local project point-persons in each county, between August 21<sup>st</sup> and August 28<sup>th</sup> of 2008 to gather preliminary information about needs for information and communications technologies (ICTs). This information focuses and orients our more detailed evaluation efforts. Participants in these sessions told us:

1. **Connectivity**—ability to connect to and through information infrastructure—*is needed in more rural and out-lying areas* of the four counties for public safety radio communications—particularly voice communications via radio—for business transactions, for education, health, and safety, for government services, and for teleconferencing and telecommuting
2. There are **diverse needs for software applications** including accounting and financial, digital media (podcasting), geographic/mapping, telecommuting and video conferencing, business intelligence (public safety and local government, and well as industry), data exchange and interoperability (healthcare and public safety), and information system security and disaster recovery; access to online applications appears to be particularly problematic for low-income families in out-lying areas
3. **Training and support are needed across sectors but especially in business and education**; while workers need technical skills, ICTs are underutilized because administrators, business owners, managers, and professionals are not fully aware of their functionality
4. **Education, including libraries and low-income families as well as schools, has the greatest needs for additional and updated hardware**; there was great concern that low-income families, particularly those in rural areas, were at a great disadvantage due to poor information infrastructure
5. **Public safety has probably the most compelling reason for needing enhanced information infrastructure: saving lives**. Local governments have the broadest range of needs and the most diverse and numerous practical justifications for those needs. Local government and public safety emphasized the goal of being simultaneously more efficient and more responsive
6. **Collaboration, particularly private-public partnerships, and standardization were noted as needed** for efficiently and effectively developing and utilizing information infrastructure

These needs suggest **a vision for the region's information infrastructure**: *public and private enterprises collaborate to enable ubiquitous communication for public safety, and build on that to provide other organizations and all citizens more diverse and higher-quality ICT products at lower prices, to be more efficient, better informed, and responsiveness, making the region more competitive in the global economy.*

## DETAILED FINDINGS

Session 1 participants were asked to identify what types of technology were needed in their county, who had the greatest needs, where the technology was needed, and how it might be acquired. Many came with the expectation that the discussion would focus on broadband and other types of connectivity, but were informed at the outset of the discussion that the project was considering ICTs broadly and that the goal of the session was to establish a comprehensive vision of what is required. Participants wrote their comments about needs on a work sheet then participated in a facilitated discussion about those needs, and were particularly asked what the most important areas of need were for relative to their enterprises. The contents of participants' written comments have been analyzed to identify and quantify the topics and subjects mentioned. This quantitative analysis is combined with a qualitative analysis of needs by sector to provide preliminary insights into needs for ICTs in Chattooga, Floyd, Polk, and Walker counties. It should be emphasized that *the needs described below come directly from comments of participants.*

## WHAT ARE THE MAJOR ICT NEEDS?

**The overall most mentioned need was for greater connectivity of some sort**, mentioned in 36% of comments. While broadband (always on high-speed internet connectivity) was explicitly mentioned five times, other types of connectivity were also highlighted, especially public safety radio and cellular telephone. Some comments on broadband characterized it as readily available, while others maintained that it was widely unavailable. Issues with broadband seem to relate to capacity and reliability as often as simple availability. Affordability was also a common issue related to connectivity.

<i>Topic/subject</i>	<i>Mentions</i>	<i>Percent</i>
What is needed, overall	100	100.0%
Connectivity	36	36.0%
Applications	26	26.0%
Support and training	11	11.0%
Organizations	7	7.0%
Funding	5	5.0%
General/Other	5	5.0%
Hardware	5	5.0%

**Software applications were the next most frequently mentioned technology needs**, in 27% of comments. Specific applications included accounting and financial, digital media (podcasting), geographic/mapping, telecommuting and video conferencing, business intelligence (public safety and local government, and well as industry), data exchange and interoperability (healthcare and public safety), and information system security and disaster recovery.

**Support and training were mentioned in 11% of comments, generally in relation to education and training needed to increase technical skills.** Hardware—computers, radios, and telephones—was mentioned 5% of the time, as was funding. There were several general comments, including uncertainty about what was needed, challenges such as language barriers, importance of equitable access to technology, and the role of technology in supporting economic development. Other subjects mentioned in relation to “what is needed” actually referred to organizations or sectors.

**Discussion of technology needs often related to a shortage of knowledge.** One participant suggested the need was for “Leaders that understand technology” while another noted the range of skills from “those who were brought up with technology to those who hate the things [computers].” Participants seemed to feel that those who were more knowledgeable about technology had better access to ICT products and services. Several

<i>Topic/subject</i>	<i>Mentions</i>	<i>Percent</i>
Who has needs, overall	98	100.0%
<b>Business &amp; industry</b>	25	25.5%
<b>Education, colleges, libraries, schools</b>	15	15.3%
<b>Public safety</b>	13	13.3%
Classes or types of people	11	11.2%
General	10	10.2%
<b>Government</b>	9	9.2%
Geographic areas	6	6.1%
<b>Healthcare</b>	5	5.1%
Purposes	4	4.1%

participants noted the challenges of evaluating technology, and even more expressed frustration with information systems that were not inter-operable, causing inefficiency and undermining solid decision making. Lastly, there was a general sense that many in the targeted sectors—particularly smaller organizations—simply are not making the most of the technology because they do not know what it is capable of and do not have the resources or time to learn.

## WHO HAS THE GREATEST ICT NEEDS?

Nearly as many subjects (98) were mentioned in regards to *who* needs technology as to what technology is needed. **Business and industry subjects were mentioned as having the greatest needs in almost 26% of**

**participants' comments.** Most of these were simple mentions but several specified “speed”—obviously referring to connectivity—while others mention websites, accessing and sharing information with consumers/customers and suppliers, and employees.

**Education—schools, colleges, etc.—was mentioned as a subject in more than 15% of comments.** Again most were simple mentions but two mentioned improved educational processes/programs and/or outcomes. Over 13% of the comments included some aspect of public safety, several of which include rationales for these needs such as reduced response times, coordination with other agencies and sectors, and the potential for other sectors to use the same infrastructure as public safety.

**Certain classes or types of people were mentioned in 11% of comments, primarily less affluent groups such as children, low-income families, seniors, and students.** But “department heads,” non-technology savvy persons, and consumers were also mentioned.

**Geographic areas, government, healthcare, and particular purposes were each mentioned in less the 10% of the**

<b>Topic/subject</b>	<b>Mentions</b>	<b>Percent</b>
Where is tech needed, overall	52	100.0%
Specific areas	25	48.1%
Types of organization/people	10	19.2%
Inside cities	5	9.6%
Outside cities	5	9.6%
General	4	7.7%
Transportation corridor	3	5.8%

**comments.** These were often very general statements if not simple mentions, such as “all agencies” or “outlying areas.” But there were also underlying issues mentioned in these comments, including reducing costs, supporting economic development, improving utilities, increasing efficiency, and standardization. 10% of the comments were general in nature, noting economic conditions, lack of competition, and security as issues.

#### WHERE ARE ICTS NEEDED MOST?

**Nearly half of the comments regarding where technology is needed included some geographic areas, typically “outlying” or rural areas.** Geographic areas that participants indicated as lacking information infrastructure to provide 2-way radio, broadband, and cellular telephone connectivity were:

- Aragon
- Armuchee
- Cave Spring
- Cedartown
- Chattoogaville
- Coosa
- Esom Hill
- Georgia highway 100 corridor
- Georgia highway 140 corridor
- Holland
- Lake Creek
- Lookout Mountain (southern portions)
- McLemore Cove
- Menlo (cellular)
- Mountain View
- North Ave. (Rome)
- North Cloudland Area
- North Floyd County
- North Rome
- Pepperell
- Prior Station
- Rockmart
- Rossville
- Shannon
- Taylorsville
- Teloga
- Texas Valley
- US highway 27 corridor (between cities/around county lines)
- Wax Community

**Over 19% of the comments mentioned types of organizations or people, generally businesses, libraries, residents, and schools.** General mentions of needs inside and outside cities were noted in 9.6% of comments each (not

including mentions of outlying or rural areas), and some 6% of the comments referred to transportation corridors of some sort. General mentions, made in about 8% of comments regarding where technology was needed ranged from “anywhere” to “more ISP competition” to “if our community [members] were educated with respect to what they were missing ... we would have to provide the technology.”

#### WHY ARE ICTS NEEDED?

Comments about why more information infrastructure is needed in northwest Georgia aligned closely with comments about who needed it. **Over 23% of the comments mentioned business and industry in some way.** Many of these were just simple mentions. Several of the comments mentioned reasonably specific business functions like communication with customers, electronic data interchange, marketing, selling products online, telecommuting, and video conferencing. A few mentioned general goals such as “attracting business” and “to compete globally.” A few others mentioned assessments to identify what is needed.

<i>Topic/subject</i>	<i>Mentions</i>	<i>Percent</i>
Why is tech needed, overall	56	100.0%
<b><i>Business and industry</i></b>	13	23.2%
<b><i>Public safety</i></b>	13	23.2%
<b><i>Education</i></b>	8	14.3%
Families & individuals	7	12.5%
Better infrastructure	5	8.9%
General	4	7.1%
<b><i>Government</i></b>	3	5.4%
<b><i>Healthcare</i></b>	1	1.8%
Tourism	1	1.8%

**Many of the 23.2% of comments mentioning public safety referred to planning for and responding to disasters and to saving lives,** but it was also noted that the technology could make public safety more efficient and could be used to provide vital information to citizens such as child car seat safety and first aid.

**Education was mentioned in over 14% of comments, families and individuals were mentioned in nearly 13%, and both were often mentioned for similar reasons:** education and the economy are becoming increasingly technology-enabled so folks who do not have

access to information infrastructure also do not have access to opportunities for economic advancement.

Effectively 9% of the comments cited improvement in information infrastructure as a reason in and of itself for more technology, particularly in terms of improved availability and reliability.

**Possibly the most unique aspect of responses to this question were the general comments about the benefits of the technology.** They are worth sharing verbatim:

- **Information sharing. Consumers will demand. Accuracy & instantaneous.**
- **More data that is available and easy to access**
- **Needed for planning, implementation, and monitoring. The impact will be better identification of needs and more economical provisioning.**
- **More efficient operations, lower future staffing needs. Better interaction with community.**

Government, healthcare, and tourism were each mentioned by participants in this section but only minimally. Tourism was the only one that got substantial consideration by one participant who noted the potential value of GPS and podcasting technologies to support tourism.

#### HOW MIGHT NEEDED ICTS BE ACQUIRED?

The fewest subjects related to how to acquire information infrastructure resources were mentioned by participant, but the comments did exhibit diverse thoughts about how to increase the availability and use of ICTs. **The most**



**often mentioned means of acquiring the technology was collaboration** in a third of the comments. Several participants suggested collaborating across jurisdictions and sectors. Others mentioned aggregating demand, centralizing technology services for multiple organizations, cooperating to achieve common goals, public-private partnerships, and standardization.

<i>Topic/subject</i>	<i>Mentions</i>	<i>Percent</i>
How to get tech, overall	43	100.0%
Collaboration	14	32.6%
Funding	13	30.2%
Infrastructure	8	18.6%
Assessment	3	7.0%
Disaster	1	2.3%
Leadership	1	2.3%
Unsure	1	2.3%
Stakeholders	1	2.3%
Support and training	1	2.3%

**Funding was the second most mentioned subject** regarding “how,” in just under a third of the comments. Many of these were simple mentions of grants or SPLOSTs (for public safety). Several mentions clearly related to lack of funding. Collaboration and funding were mentioned together several times.

**Infrastructure was mentioned as a “how” in 18.6% of the comments.** Most of these referred to particular facilities or technologies. The fiber optic trunk line along the Norfolk-Southern railroad that

runs through the region got the most mentions, but microwave, wi-fi, and other types of communication links were also mentioned. Three of the comments (7%) mentioned conducting an assessment of what is available.

A disaster, leadership, specific stakeholders, and support and training were each mentioned once. One comment simply said, “Unclear!”

#### NEEDS BY SECTOR

The following information regarding needs was taken directly from comments of participants.

##### *Business & industry*

According to session 1 participants business and industry in northwest Georgia require technology to compete globally, to conduct business electronically with customers and suppliers, and to secure their facilities and systems.

**The most frequently mentioned needs were for telecommuting, video conferencing, and similar technologies to substitute for travel.** Distributors, financial service companies, manufacturers, real estate agents, and retailers, require cell phones and broadband to sell their products and services—international business, including cell phones that operate in other countries, was mentioned several times—and conduct business. It was noted that **many businesses, especially small ones, are not really using ICTs and need assistance, including support and training.** Increased use of ICTs will expand markets and increase sales. But these applications require high-speed access to the internet from home as well as from business locations, for customers and employees as well as firms. **Several participants mentioned the need to standardize technology, increase compatibility, and reduce costs and downtime.**

**Business and industry require employees who are trained to use technology,** who understand technology and its benefits, and schools need technology to adequately prepare the children for the workplace. It was mentioned that improved technology for healthcare and public safety will also improve businesses’ bottom line. Several participants noted that access to major fiber optic communication line could provide unlimited bandwidth for these purposes, but there also needs to be access along major roads and in rural areas.

Public-private partnerships, grants, SPLOST initiatives were indicated by business participants as potential means for improving the region’s information infrastructure. The slow economy, small county population for business support, and lack of infrastructure funding were mentioned as possible impediments to these goals. Prior to

attempting improvements **business participants would like to have an assessment of how ICTs are currently being used, what ICT products and services are available, and how to better use the information infrastructure**—where it might be deficient, what problems it may have, and what steps to take to resolve any deficiencies and problems.

### *Education*

Access and affordability are major issues for education. Participants from the education sector said numerous times that **the greatest need is for low-income children and their families to have access at home—personal computers and residential broadband**—particularly those in more rural, out-lying areas of the counties. Several participants pointed out that libraries, schools, and other educational facilities are widely dispersed across the region. Like those in business and industry, education participants expressed interest in how to access and use the fiber optic trunk line on railroad right-of-way, what such access might cost, and how it might be distributed to consumers. Establishing wi-fi hotspots around the region was suggested as one way to meet these needs.

**The schools and libraries require additional hardware, software, and support and training** according to the education leaders who participated in these sessions. There were multiple mentions of needs for hardware in libraries and schools, and for more support and training. Support services, especially training, are desperately needed in the education sector, insisted one participant. It was noted in various ways that training and experience with ICTs beyond formal classes are required to effectively use the technology. Another noted that the state mandated student information system requires upgraded computers for all teachers, but there are no funds available for these upgrades. Generally, according to participants, citizens need to be more aware of what is available in other places and what the benefits of ICTs could be for education. **Software is needed for business functions such as accounting as well as for delivering educational content.**

Much of education is becoming technology-based, one participant pointed out, and **without access to ICTs resources that would allow educators to implement the latest developments in their field, the region's education systems will see major detrimental effects.** Textbooks and instructional materials are moving to an on-line format. If these materials were accessible at home via the internet, students and teachers would be better able to extend learning and improve educational achievement. **The underlying needs most often mentioned by education participants were meeting students' needs for information in order to prepare them to compete in the job market,** and for citizens to have ready access to basic information for health, education, and government services. Several participants maintained that children from homes without connectivity are at a disadvantage.

**Technology-enabled improvements in public safety, such as accurate and timely threat information and responsiveness, were identified as a requirement by education participants.**

**Common planning for technology needs was suggested as a means of meeting the needs.** Educational facilities, especially the colleges, generally have adequate infrastructure according to participants, but lack financial resources to provide training and are constrained by lack of connectivity in out-lying areas. Funding was an issue for most every education participant. Several participants expressed concerns that ICT needs might not be met because there is too little competition and the costs are excessive. Need for additional information about what products and services are available was mentioned by several participants.

### *Government*

Government participants were clear about underlying business needs for ICTs, as well as what was needed and where. **Enhanced connectivity is required inside and just outside city limits, where commercial and industrial businesses and residents are concentrated, at government offices, and along transportation corridors (US**

**Highway 27 was most frequently mentioned), as well as in out-lying areas.** One participant said that county lacks basic infrastructure to support intensive commercial/industrial development, implying that information infrastructure should be developed in conjunction with more traditional infrastructure. Several participants suggested wireless connectivity (“wi-fi”) throughout the region as the best way to meet these needs, and more discussed accessing the fiber optic trunk line along the railroad right-of-way. In contrast, **several participants from local governments said broadband was adequately available and that they really needed more, better business software,** specifically for financial and operational purposes. Increased cell phone connectivity was mentioned as a requirement, too. One participant suggested that as much as half of the county was not covered.

**Government participants stressed practical needs.** They mentioned needing ICTs to identify and attract new high-tech industries (particularly automotive), to enhance tourism and attract more tourists (e.g., with podcasting), to notify the public in case of emergency, to plan, deploy, and manage infrastructure and utilities, to deliver governmental, medical, and social services, and to boost educational achievement and reduce school drop-out rates. Government participants felt more businesses could use internet for selling products, that information infrastructure was needed to provide existing industry, commercial, small business with websites, and for communication with customers. The technology could be used to promote the region to industry and visitors, to support home-based businesses, and to foster “green” technologies and practices to conserve the region’s natural assets (costs associated with air quality, energy use, water and sewage, solid waste disposal were at least implicit in numerous comments). Agriculture was identified as a sector that could benefit from ICTs.

Government participants focused on internal operational needs, too: **Automation of and online access to government services, particularly more mapping/GIS services, inventory of everything from vacant buildings to sewer lines to potholes, building code information for contractors and homeowners, scheduling inspectors and routing maintenance forces, more effective and reliable public safety communications, connections between all county government departments and intergovernmental connections, better planning, implementation and monitoring of programs, enhanced information resources for businesses and residents, increased efficiencies, lower future staffing needs, and hopefully lower tax needs, overall better interaction with community.** All of these functions and more were mentioned as ICT needs for local governments in northwest Georgia. A participant noted *the solution is not just to get the technology but to use it, and it would require leadership* to meet all of these needs.

As with participants from education, those from government identified market challenges related to meeting their needs, particularly that there are not affordable alternatives to and competition for the existing broadband providers. They seemed to feel that this was evidence of a knowledge gap between the providers and their customers: knowledge of the product and of need for the product. Educational (including libraries), governmental, industrial (including development authorities and publicly owned industrial parks), and business (including entrepreneurs and home-based businesses) customer were identified as drivers to overcome these challenges. Residential customers were characterized as beneficiaries rather than drivers. **Intergovernmental collaboration on information services and systems, a regional public-private partnership, grants, and private investment were all noted as means to quickly and economically close the knowledge gap and develop needed information infrastructure.**

### *Healthcare*

Healthcare participants emphasized the need for collaboration and cooperation. The needs they mentioned are straightforward if not simple to fulfill: **connectivity between healthcare providers and patients and interoperability between health information systems to enable accurate and instantaneous information sharing.** Consumers will demand such functionality, one participant noted. They specified concerns about emergency

response and disaster recovery as well as needs for access to basic information such as immunization records via secure public websites. Several of the major healthcare providers have already made major steps toward these goals, according to participants, and are working to extend the solutions to other entities such as county health department. **Outstanding needs are “satellite centers” to assist and train non-technology-savvy consumers, and standardization by physicians’ offices.** Healthcare participants mentioned need for an inventory, apparently of ICT resources, as one step towards meeting these needs.

### *Public safety*

As with healthcare, public safety participants had reasonably simple overall requirement that could be quite difficult to fulfill: **ability to communicate and share information among all agencies, including education, healthcare, and major employers, as well as the full range of public safety services, in order to coordinate and respond effectively** to crime, natural disasters, emergencies, and other threats to public safety. The major issue for public safety officials is spotty access to land-mobile radio repeaters and inability to disable or enable communication between radio systems.

While they would like robust broadband access at their various facilities—911 centers, fire halls, police stations, etc.—**high-quality radio communications the greatest need for public safety.** This requirement includes eliminating interference from other radio users (those who share the licensed frequencies) and base equipment to enable communication with agencies on other frequencies when needed, as well as deploying radio repeaters in remote locations and large buildings to allow ubiquitous communications. **Public safety officers are heavy cell phone and mobile data (“AirCard”) users and numerous participants identified gaps in cell phone service throughout the region.** Public safety participants also noted that they need more computers in their vehicles for mobile applications.

**Public safety’s fundamental needs are simple and profound: they need technology for protecting citizens and saving lives.** They need to be able to call for back up, provide guidance and knowledge to first responders, and alert the public to emergencies. But public safety participants mentioned numerous, more mundane needs such as filing incident reports, training police officers and fire fighters, providing fire hydrant locations to insurance companies, and analyzing crime statistics to identify high-crime areas. They would also like to have access to national applications such as NIMS and WebEOS. **The technology should enable public safety to be more efficient, proactive, and responsive.** All of these require improved connectivity—for mobile voice and high-speed data communications—throughout the region and standardization of equipment and systems. Public safety participants provided much of information about specific locations, mentioned above, where there are connectivity gaps.

**Government officials, county commissioners and management, and department heads need to personally implement the technology** according to several participants for it to be practical and useful. Public safety participants repeatedly mentioned the importance of working with other organizations in this projects other targeted sectors, even suggesting that they infrastructure they use for public safety purposes could also be used by others. They, like other participants, noted the lack of funds for such projects but suggested that grants and SPLOSTs could cover some of the costs, particularly given the critical nature of the need. It is unfortunate but true, stated a participant, that it will take a "knee-jerk" response to a disaster or a catastrophic event of proportions to make this a priority.

## BENCHMARKING RESULTS

The benchmarking survey process began in September of 2008 with a list of 859 locations, which included only “major” business and industry, e.g., only those that manufacture for markets outside the region. This list was winnowed down to a list of 449 by eliminating “branch” locations (including schools, for example, that were part of a school system or clinics that were part of a hospital system). All of these organizations were contacted by phone between September and November of 2008, invited to participate in the benchmarking, and, if willing, asked for an e-mail address for a person who knew about the organization’s use of ICTs. This process resulted in a 160 organizations receiving a survey (most via e-mail, but several via fax and post). There were a total of 116 responses to the survey, but many of these included no data or were duplicates. We ended up with a total of 82 usable surveys and 64 complete surveys. This is a response rate of 71% (40% for fully completed surveys), representing 18% (14% fully completed) of the originally identified population. All of these numbers are excellent; about as well as can be expected for this type of research.

There are several practical limitations to this benchmarking process that should be noted. First, the survey used a “convenience” sample rather than a random sample: We started with the entire “population” of organizations but only surveyed those who expressed a willingness to participate. It is therefore NOT a scientific, statistically reliable and valid, survey. Such a survey would be prohibitively expensive, costing in the hundreds of thousands of dollars to conduct. We simply did not have the resources necessary to do that. Second, those surveyed were at least reasonably technology-savvy: Each had an e-mail address, ability to use a web-based survey, and access to the internet. Less technology-savvy individuals and organizations were systematically excluded and/or self-selected out of the benchmarking process. Lastly, those involved in the survey were in very diverse positions—from executives to managers to technicians—and represented equally diverse organizations, spanning the private and public sectors. This diversity reflects the region but it impacts the reliability and validity.

The implication of these limitations is that the benchmark should be seen as just that: “a standard of excellence, achievement, etc., against which similar things can be judged.” It provides a sense of how ICTs are being used by the most technology-intensive organizations in the region as a point of reference. It points to where there are opportunities to increase utilization and capture additional benefits of ICTs, and it suggests where there is need for additional information infrastructure, particularly when combined with the global best practices. But it should not be seen as an “objective measure” of ICTs for the region.

## REGIONAL OVERVIEW

Benchmarking participants from business & industry and local government were the sectors with the highest spending per user on ICT. The exceptions were Floyd County, where healthcare per user expenditures were second to local government, and in Walker County where healthcare per user spending was indicated as the highest for any sector in the four counties. Healthcare participants in the focus groups to review the benchmarking results maintained that their levels of ICT expenditure were significantly higher than these result indicate.

Per user spending for these respondents is moderately negatively correlated with the number of users per PC (-0.347), per server (shared-use computers, including mini- and mainframe computers) (-0.35), and per broadband line (-0.222). Essentially, this bears out common wisdom that the more an organization spends the more resources there are. Note that “broadband lines” is simply a number of connections. As shown in table 13 there was quite a variety of types of broadband connections, many of which (digital carriers and optical fibers) are more expensive and designed for multiple users. There was a weak negative correlation (-0.178) between per person expenditures

and percentage of respondents that indicated having a website. This suggests that websites might serve as a substitute for other ICT investments.

Table 1. ICT Resources

<i>County-Sector</i>	<i>Average</i>						
	<i>ICT spending per person</i>	<i>Users to PCs</i>	<i>Users to servers</i>	<i>Broadband lines</i>	<i>Users per broadband line</i>	<i>Have website</i>	<i>Features per website</i>
Chattooga	\$914.89	1.94	45.32	2.5	57.11	76%	3.77
Business & Industry	\$1,880.38	1.24	35.10	2.4	12.63	71%	3.60
Education	\$111.97	1.99	181.85	4.7	297.04	100%	5.33
Healthcare	\$160.71	3.02	3.44	1.0	7.33	67%	2.50
Local Government	\$2,500.00	1.67	1.67	2.0	2.50	0%	ND
Floyd	\$1,077.83	2.95	62.38	11.8	311.79	96%	4.54
Business & Industry	\$886.40	2.38	34.13	16.8	10.62	100%	3.00
Education	\$732.04	2.81	94.20	6.8	611.92	90%	5.80
Healthcare	\$1,643.94	4.27	40.42	7.0	555.58	100%	4.33
Local Government	\$3,028.85	2.71	55.97	33.0	31.46	100%	5.00
Public Safety	ND	6.18	55.25	1.5	73.00	100%	4.00
Polk	\$1,135.29	1.71	69.68	8.1	408.99	75%	2.78
Business & Industry	\$1,580.00	1.10	10.00	6.3	2.46	67%	3.75
Education	\$67.42	2.	370.83	1.0	4,450.00	100%	2.00
Local Government	\$1,102.45	1.79	20.50	16.7	8.19	100%	2.00
Public Safety	\$463.41	3.25	22.70	7.0	6.76	0%	ND
REGION	ND	6.30	77.50	10.0	10.35	100%	4.00
Business & Industry	ND	8.67	77.50	11.0	16.36		ND
Public Safety	ND	1.56	ND	9.0	4.33	100%	4.00
Walker	\$1,702.07	2.21	32.48	13.4	126.68	93%	4.85
Business & Industry	\$2,050.00	1.35	20.12	12.6	6.70	100%	4.50
Education	\$105.07	2.95	23.14	1.5	458.50	100%	4.50
Healthcare	\$6,000.00	1.75	13.22	10.7	340.71	67%	4.00
Local Government	\$280.28	3.49	64.75	38.0	9.30	100%	7.50
Public Safety	ND	3.93	75.50	8.0	11.10	100%	4.00
<b>All</b>	<b>\$1,167.27</b>	<b>2.50</b>	<b>52.73</b>	<b>9.1</b>	<b>214.81</b>	<b>87%</b>	<b>4.18</b>

Table 2 includes indices for the intensity of utilization of ICTs by participants and the level of benefits. The utilization index is derived from the percentage of employees using various software applications: The more employees using the more applications, the higher the index. Although this index conceptually runs between 0.0 and 1.0, 0.5 is practically “full utilization.” The benefits indices—cost reduction, revenue increase, and new

products—have a range of -3.0 to 3.0, with a negative index meaning ICTs had a negative impact. These results suggest that education has lowest utilization and business & industry the highest. Review of the data suggests this is because respondents from education use a limited range of applications. Overall, business & industry appear to derive the greatest benefits from ICTs, followed by local government. Business & industry and local government seem to be getting the greatest value from using ICTs for new products. Whereas education and public safety appear to be getting the lowest value from ICTs for cost reduction (this contrasts with feedback from public safety participants in the focus groups to review this data). Healthcare respondents, according to responses to the benchmarking survey, uniformly (there was low variation across respondents, and each index was low relative to the average for other sectors) realized the least value from ICT investments.

Table 2. ICT utilization and impacts

<i>County-Sector</i>	<i>Indices</i>			
	<i>Utilization</i>	<i>Cost reduction</i>	<i>Revenue increase</i>	<i>New products</i>
Chattooga	0.23	1.42	1.63	2.25
Business & Industry	0.27	2.29	2.00	2.67
Education	0.04	0.79	2.00	2.25
Healthcare	0.19	1.21	0.90	ND
Local Government	0.11	ND	ND	ND
Floyd	0.12	0.94	1.44	1.90
Business & Industry	0.12	0.71	0.87	1.50
Education	0.08	0.91	1.68	2.22
Healthcare	0.17	1.24	1.57	1.50
Local Government	0.11	2.57	1.83	2.25
Public Safety	0.09	0.29	1.17	1.25
Polk	0.23	0.79	1.27	1.92
Business & Industry	0.30	0.94	1.52	2.75
Education	0.04	0.43	1.30	1.50
Local Government	0.14	0.40	0.93	0.75
Public Safety	0.16	ND	0.70	3.00
REGION	0.07	0.57	1.60	ND
Business & Industry	ND	ND	ND	ND
Public Safety	0.20	0.57	1.60	ND
Walker	0.12	1.16	1.28	1.40
Business & Industry	0.23	1.06	1.17	1.70
Education	0.02	0.29	1.40	1.50
Healthcare	0.11	1.14	1.05	0.50
Local Government	0.05	1.86	1.90	1.25

<i>County-Sector</i>	<i>Indices</i>			
	<i>Utilization</i>	<i>Cost reduction</i>	<i>Revenue increase</i>	<i>New products</i>
Public Safety	0.03	ND	0.90	1.00
<b>All</b>	<b>0.16</b>	<b>1.04</b>	<b>1.41</b>	<b>1.84</b>

## ORGANIZATIONAL CHARACTERISTICS

Business & industry had the highest percentage of respondents to the benchmarking survey (39%), but education respondents represented by far the most users (73%, including students) and, along with local government, the vast majority of physical locations (sites) in the region.

Table 3. Respondent size

<i>Sector</i>	<i>Respondents</i>	<i>Users (employees and clients on-site)</i>		<i>Sites</i>
		<i>Total</i>	<i>Average</i>	
Business & Industry	32	3,435	107	54
Education	17	36,539	2,149	96
Healthcare	10	6,740	674	52
Local Government	10	3,077	308	88
Other	6	98	16	10
Public Safety	7	465	66	28
<b>All</b>	<b>82</b>	<b>50,354</b>	<b>614</b>	<b>328</b>

## BENEFITS AND COSTS

Overall, respondents to the benchmarking survey indicated spending an average of nearly \$900,000 per year on ICTs, or just over \$1,000 per year per employee. Generally, they foresee that amount increasing by 5% per year over the next three years. They rated various impacts of ICT expenditures on a scale -3 through +3, with the overall average coming to just below 1, or barely positive.

Education and business & industry sector respondents saw the greatest overall impacts, with education reporting the greatest impacts relative to spending. Particularly interesting are the types of impacts: ICTs had the least value for reducing (non-ICT) costs, and the greatest value for creating new products and services. Relating this to utilization indices, above, there seems to be opportunities to further automate processes to reduce costs of facilities, labor, and materials.

Table 4. ICT spending and budget trends

<i>Sectors</i>	<i>ICT expenditures</i>			<i>ICT spending trends</i>	
	<i>Total</i>	<i>Average</i>	<i>Per person</i>	<i>Past 3 years</i>	<i>Next 3 years</i>
Business & Industry	\$10,744,000	\$596,889	\$1,567.95	+10%	+5%



Education	\$18,105,000	\$1,131,563	\$495.87	+5%	+5%
Healthcare	\$17,515,500	\$2,502,214	\$1,875.54	+5%	+5%
Local Government	\$2,214,500	\$276,813	\$1,553.20	+5%	+5%
Other	\$34,500	\$5,750	\$650.07	No change	+5%
Public Safety	\$38,000	\$38,000	\$463.41	No change	+5%
<b>All</b>	<b>\$48,651,500</b>	<b>\$868,777</b>	<b>\$1,167.27</b>	<b>+5%</b>	<b>+5%</b>

Table 5. Impacts of ICTs

Impact Rating: -3 = strongly negative to +3 = strongly positive

Average overall impact rating: 0.997769

<i>Sectors</i>	<i>Reducing costs</i>		<i>Increasing support/revenue</i>		<i>Creating products/services</i>		<i>Overall Rating</i>	<i>Impact ratio†</i>
	<i>Average</i>	<i>Variation*</i>	<i>Average</i>	<i>Variation*</i>	<i>Average</i>	<i>Variation*</i>		
Business & Industry	1.13	0.73	1.32	0.95	2.04	0.38	1.16	3.15
Education	0.80	1.16	1.68	0.83	2.12	0.38	1.25	15.80
Healthcare	1.21	1.27	1.23	1.12	1.25	0.71	0.91	2.60
Local Government	1.67	0.64	1.55	0.87	1.42	0.82	0.73	2.30
Other	0.46	0.54	1.30	0.94	1.67	0.00	-0.01	0.38
Public Safety	0.43	1.11	1.11	1.41	1.63	0.88	0.68	1.02
<b>All</b>	<b>1.04</b>	<b>0.92</b>	<b>1.41</b>	<b>0.97</b>	<b>1.84</b>	<b>0.49</b>	<b>0.96</b>	<b>6.41</b>

\* Amount of variation in ratings, measured in standard deviation

† Impact Ratio is the number of impact rating “points” per thousand dollars of ICT expenditure per person (including clients using technology such as students)

## BARRIERS AND DRIVERS

The costs of ICTs were consistently noted as the major barriers to ICT use, particularly the need to upgrade current or potential ICTs. The need for greater staff knowledge was also indicated by respondents as a major barrier. While management commitment has not been an issue in the past, it appears to be a major barrier in the future. This suggests that, given the results discussed above, managers’ expectations for ICT impacts have not been met, resulting in retarded ICT investments.

Note that business priorities are strongly oriented towards new products and services and actively engaging customers in enhancing the value of products and services. Also, note that less than 70% of top personnel actively use or even provide oversight for ICT spending (less than half are involved in defining requirements or reviewing ICT plans). This suggests that while the benefits of ICTs align with business priorities key decision-makers do not see ICTs as strategic assets. It also suggests that ICTs are being underutilized to control costs and waste, confirming other findings discussed above.

## OBSTACLES TO ICT USE

Categories:

- A. Continual demand for upgrading

- B. Investment costs too high
- C. Greater know-how required from staff
- D. Risk that IT leads to inefficiency
- E. The old ways work well
- F. Lack of commitment from management

Percentage indicating obstacle existed. "Average" is an index of overall obstacles to ICT use.

Table 6. Obstacles to ICT use *past 3 years*

<i>Sectors</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>Average</i>
Business & Industry	60.0%	30.0%	50.0%	0.0%	20.0%	5.0%	27.5%
Education	87.5%	81.3%	50.0%	6.3%	6.3%	18.8%	41.7%
Healthcare	75.0%	87.5%	12.5%	0.0%	25.0%	12.5%	35.4%
Local Government	66.7%	77.8%	66.7%	0.0%	44.4%	0.0%	42.6%
Other	66.7%	83.3%	66.7%	0.0%	0.0%	0.0%	36.1%
Public Safety	42.9%	57.1%	28.6%	0.0%	14.3%	0.0%	23.8%
<b>All</b>	<b>68.2%</b>	<b>63.6%</b>	<b>47.0%</b>	<b>1.5%</b>	<b>18.2%</b>	<b>7.6%</b>	34.3%

Table 7. Obstacles to ICT use *next 3 years*

<i>Sectors</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>Average</i>
Business & Industry	65.0%	50.0%	45.0%	5.0%	20.0%	65.0%	35.4%
Education	81.3%	81.3%	56.3%	6.3%	12.5%	81.3%	46.5%
Healthcare	75.0%	100.0%	37.5%	0.0%	12.5%	75.0%	43.4%
Local Government	66.7%	77.8%	55.6%	0.0%	22.2%	66.7%	44.1%
Other	83.3%	100.0%	33.3%	0.0%	0.0%	83.3%	42.1%
Public Safety	14.3%	57.1%	14.3%	0.0%	0.0%	14.3%	18.3%
<b>All</b>	<b>66.7%</b>	<b>72.7%</b>	<b>43.9%</b>	<b>3.0%</b>	<b>13.6%</b>	<b>66.7%</b>	<b>39.1%</b>

#### BUSINESS FACTORS IN ICT USE

Table 8. Operational Priorities

Categories:

- A. Efficiency, cost control, and/or low prices
- B. Effectiveness, high-quality, and/or minimal defects or mistakes
- C. New products, services, major process improvements, or other innovations
- D. Quick delivery, rapid response
- E. Adapting products or services to client needs
- F. Client/constituent/client service makes products or services more valuable

Rating: 1 = Most important, 6 = Least important

<i>Sector</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
Business & Industry	2.92	1.72	4.41	3.29	3.25	4.52

<i>Sector</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
Education	3.47	3.00	4.00	3.93	2.81	3.81
Healthcare	2.38	2.25	3.25	3.86	4.63	4.22
Local Government	1.86	2.00	5.71	3.22	3.88	2.78
Other	2.50	2.40	5.20	2.40	3.40	4.40
Public Safety	3.40	3.40	4.00	1.40	3.50	4.17
<b>All</b>	<b>2.88</b>	<b>2.25</b>	<b>4.35</b>	<b>3.26</b>	<b>3.41</b>	<b>4.08</b>

Table 9. Upper management role in ICTs

Categories:

- A. Actively use ICT products and services
- B. Lead planning, set priorities for ICT products and services
- C. Review requirements and plans for ICT products and services
- D. Approve budget and funding for ICT products and services

<i>Sector</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
Business & Industry	59%	28%	41%	50%
Education	88%	76%	65%	94%
Healthcare	90%	40%	40%	60%
Local Government	60%	50%	50%	70%
Other	100%	67%	33%	83%
Public Safety	14%	14%	43%	29%
<b>All</b>	<b>68%</b>	<b>44%</b>	<b>46%</b>	<b>63%</b>

Table 10. Capabilities: Skills, support, and training

<i>Sector</i>	<i>Days of ICT training per year</i>		<i>Number of ICT professionals</i>	
	<i>Per user</i>	<i>Total</i>	<i>Total</i>	<i>Users per</i>
Business & Industry	3.17	5,597	86	22.68
Education	2.75	69,352	98	361.11
Healthcare	3.00	33,613	53	99.22
Local Government	2.89	13,728	22	115.21
Other	4.50	813	17	0.98
Public Safety	3.00	1,545	13	34.16
<b>All</b>	<b>3.12</b>	<b>124,648</b>	<b>289</b>	<b>143.57</b>

## SOFTWARE APPLICATIONS

The most widely used applications are for communications and information retrieval, specifically electronic messaging and web browsers. Cellular telephone services also was indicated to be quite prevalent, although less so than PC-based services. The third most widely used application among respondents was word processing. All of these were used by 40% or more of persons, on average, associated with respondents (i.e., including students and other on-site clients as well as paid personnel). Those in the 30% range included customer databases, electronic

commerce, extranet/intranet web portals, spreadsheets, and external specialty databases. Again, communications and information retrieval are widely used by respondents, along with office productivity tools. This makes sense because these are such general purpose applications. Respondents' were much less likely to use process automation such as data acquisition, design, dispatching, machine control, mobile, and work flow applications. While these applications are arguably less general purpose than the heavily used applications, they are amenable to a wide range of enterprises and, more importantly, are also arguable more valuable for controlling costs, increasing efficiency, and reducing mistakes and waste.

Table 11. Percentage of Employees Using Applications

Categories:

- A. Business & Industry
- B. Education
- C. Healthcare
- D. Local Government
- E. Other
- F. Public Safety

<i>Application</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>All</i>
Accounting, bookkeeping, or other financial	30.7%	1.3%	15.6%	9.6%	41.9%	6.7%	<b>18.5%</b>
Audio/video, multimedia, presentation (e.g., PowerPoint), or similar	50.5%	8.8%	16.7%	20.9%	67.5%	24.9%	<b>32.6%</b>
Barcoding, RFID, smart-cards, or other type of automatic data collection	34.3%	2.7%	32.0%	0.8%	-	13.6%	<b>19.5%</b>
Cellular telephone	60.9%	3.2%	19.3%	36.6%	73.0%	46.3%	<b>39.4%</b>
CNC, PLC, robotic, or other machine or controls	26.0%	0.2%	25.9%	6.8%	-	0.8%	<b>12.7%</b>
Client, patient, student, etc., database	57.5%	21.6%	42.6%	16.0%	54.0%	10.9%	<b>37.1%</b>
Design, including CAD, graphics, etc.	26.2%	0.3%	1.9%	2.2%	4.2%	-	<b>12.0%</b>
Dispatching, routing, tracking, or similar	24.0%	0.4%	36.0%	7.6%	-	4.0%	<b>18.3%</b>
E-mail, chat, or other electronic messaging	74.5%	28.8%	53.7%	36.3%	106.2%	43.3%	<b>56.6%</b>
Electronic commerce, electronic data interchange, or similar	41.9%	33.7%	13.6%	3.9%	73.8%	-	<b>34.0%</b>
Employee, human resource management	18.3%	0.6%	8.8%	2.8%	39.3%	9.5%	<b>12.0%</b>
Internal inventory, materials or finished goods, database	40.8%	2.5%	23.8%	2.7%	46.3%	3.9%	<b>21.6%</b>
Intranet/extranet, portal, web content management, or similar	47.7%	9.1%	47.3%	18.0%	100.0%	3.6%	<b>32.0%</b>
Land mobile radio, "push to talk," or	19.4%	2.2%	1.0%	39.7%	-	49.8%	<b>23.2%</b>

<i>Application</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>All</i>
similar							
Mobile application on handheld or laptop	30.0%	2.0%	15.9%	7.6%	26.8%	9.1%	<b>16.7%</b>
Order entry, sales orders, customer relationship management	36.7%	2.0%	34.0%	10.1%	66.7%	6.3%	<b>25.9%</b>
Production scheduling, workflow management, or similar	23.5%	0.9%	30.7%	1.7%	41.7%	5.8%	<b>16.9%</b>
Software development tools, including database, web, etc.	29.4%	1.5%	15.0%	0.5%	61.1%	6.5%	<b>17.1%</b>
Specialized external database (via internet or other means)	41.7%	6.1%	30.3%	12.7%	36.1%	-	<b>26.5%</b>
Spreadsheet	43.8%	9.9%	26.7%	15.9%	61.2%	16.0%	<b>28.7%</b>
Teleconferencing, web conferencing, or similar	34.5%	2.7%	12.6%	3.3%	100.0%	4.0%	<b>21.8%</b>
Word processing	58.3%	25.0%	34.2%	29.3%	85.3%	35.0%	<b>43.6%</b>
Worldwide web browser internet search	65.6%	27.9%	40.3%	36.6%	85.3%	65.2%	<b>51.0%</b>
Other	-	9.1%	8.3%	-	-	-	<b>8.8%</b>

Overall, most respondents had websites, but the vast majority were static rather than dynamic. We asked about eleven different common website features. Respondents averaged just over four features per website. Education had the most average features at just over five, while business & industry and local government had the least. These findings contrast with others that show these two sectors near the top for expenditures and impacts.

Table 12. Websites and features

Website. Having a website

- A. Clients can access and update their account information
- B. Detailed information about your organization, including location and contact information
- C. Detailed information about your organization's products and/or services
- D. Electronic payment of bills, fees, invoices, purchases, etc.
- E. Interactive map(s)
- F. Interactive query of the availability of goods and/or services
- G. Means for scheduling services and/or tracking order fulfillment
- H. Online, electronic forms for applying for jobs, ordering products or services, etc.
- I. Secure intranet (for employees) or extranet (for clients)
- J. Website activity measurement or monitoring
- K. Average number of features per website

<b>Sector</b>	<b>Website</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>U</b>	<b>J</b>	<b>K</b>
Business & Industry	84%	14%	95%	86%	19%	33%	19%	5%	33%	24%	43%	3.7
Education	94%	60%	107%	100%	33%	27%	20%	33%	47%	60%	80%	5.3
Healthcare	78%	0%	100%	86%	14%	29%	0%	0%	71%	57%	14%	3.7
Local Government	89%	25%	100%	75%	63%	25%	25%	13%	38%	38%	50%	4.5
Other	100%	0%	100%	100%	0%	17%	0%	0%	33%	17%	33%	3.0

Public Safety	80%	0%	100%	75%	0%	50%	0%	25%	75%	25%	50%	4.0
<b>All</b>	<b>87%</b>	<b>23%</b>	<b>100%</b>	<b>89%</b>	<b>25%</b>	<b>30%</b>	<b>15%</b>	<b>13%</b>	<b>44%</b>	<b>38%</b>	<b>49%</b>	<b>4.2</b>

## CONNECTIVITY AND COMPUTERS

Discounting the “other” sector because it is too small and diverse, as well as outside the scope of the project, business & industry respondents indicated having the fewest persons per computer and internet connection (healthcare had the most servers—shared used computers—relative to the number of users). Education and healthcare had the most very high speed connections (i.e., optical fiber), in spite of these sectors having relatively few respondents. This suggests that persons in those sectors have significant amounts of bandwidth per user, if not flexibility. Cellular phone based internet connections have lower bandwidth but are much more flexible, and these were predominantly used by local government and by business & industry. Of course, education and healthcare tend to be very facility-based, their customers generally must go to them for service. Local government, especially including public safety, and business & industry are more likely to go where the client (or at least their needs and problems) are physically located. Cellular, cable, and DSL broadband are the most prevalent, suggesting that low cost is more important than high capacity.

Table 13. Quantity of connections

<i>Sector</i>	<i>Broadband Connections</i>			<i>Dial-up Connections</i>
	<i>Total</i>	<i>Average</i>	<i>Persons Per</i>	
Business & Industry	257	9	9.1	2
Education	86	5	773.6	-
Healthcare	57	6	301.2	3
Local Government	227	25	15.6	2
Other	25	4	4.8	-
Public Safety	42	6	26.6	15
<b>All</b>	<b>694</b>	<b>9</b>	<b>214.8</b>	<b>22</b>

Table 14. Types of connections

<i>Sector</i>	<i>Broadband connections</i>							<i>Total</i>	<i>Average</i>	<i>Dial-up</i>
	<i>Cable</i>	<i>Cellular</i>	<i>Wireless</i>	<i>DSL</i>	<i>Satellite</i>	<i>T-1</i>	<i>Fiber</i>			
Business & Industry	27	78	17	46	3	78	8	257	9	2
Education	2	4	25	5		33	17	86	5	
Healthcare	11		4	6		20	16	57	6	3
Local Government	66	103	7	33		14	4	227	25	2
Other	12	4		8		1		25	4	
Public Safety	10	9		19			4	42	6	15
<b>All</b>	<b>128</b>	<b>198</b>	<b>53</b>	<b>117</b>	<b>3</b>	<b>146</b>	<b>49</b>	<b>694</b>	<b>9</b>	<b>22</b>

Table 15. Personal computers and shared computers

<i>Sector</i>	<i>Personal Computers</i>		<i>Shared Computers (e.g. servers)</i>	
	<i>Total</i>	<i>Persons per</i>	<i>Total</i>	<i>Persons per</i>
Business & Industry	25,755	2.0	1,071	33.2

Education	14,279	2.6	339	114.9
Healthcare	4,599	3.0	232	19.0
Local Government	1,328	2.5	66	40.1
Other	75	1.6	7	14.3
Public Safety	139	4.0	12	51.2
<b>All</b>	<b>46,175</b>	<b>2.5</b>	<b>1,727</b>	<b>52.7</b>

## PARTICIPATING ORGANIZATIONS

The Georgia Tech Enterprise Innovation Institute recognizes and appreciates the participation of key personnel from following organizations, as well as numerous other organizations that did not wish to be identified:

- ADAMS Management
- AT&T
- Bankson Oil Co.
- Berry College
- Brady Realty Inc
- Burdick Enterprises
- Cedar Hill Computer Services
- Cedartown Fire Department
- Chattooga County Chamber of Commerce
- Chattooga County Government
- Chattooga County Library System
- Chattooga County Schools
- Chattooga Eye Care
- Chattooga Family Connection
- ChattoogaNET, LLC
- Cherokee Regional Library
- Chickamauga City Schools
- Chickamauga Police Department
- Christopher T. Keenan DDS LLC
- City of Aragon
- City of Cave Spring
- City of Cedartown
- City of Chickamauga
- City of LaFayette
- City of Rockmart
- City of Rome
- City of Rossville
- Comcast
- Commercial Fluid Power
- Computer Central, LLC
- Coosa Valley Red Cross
- Coosa Valley Regional Development Center
- Coosa Valley Technical College
- Darlington School
- Dotson Personal Care Home
- Earle Rainwater Funeral Home
- Extreme Photoz
- Floyd County Emergency Management
- Floyd County Government
- Floyd County Police Department
- Floyd County Schools
- Floyd County Sheriff
- Floyd Medical Center
- Gary W McConnell, Consultant Service
- Georgia Highlands College
- Georgia Technology Authority
- Goodson's Garage
- Graphic Advertising
- Greater Rome Chamber of Commerce
- Happy Place, LLC
- Harbin Clinic
- Hutcheson Medical Center
- Infrared Research Inc.
- Lookout Mountain CSB
- Management Insights
- Newark Paperboard Products
- News Publishing Co.
- Northwest Georgia Auto Alley Initiative
- Northwest Georgia Joint Development Authority
- Northwestern Technical College
- Oakwood Christian Academy
- OTR Wheel Engineering
- Owens & Bowen CPA PC
- Parker Fiber-Net
- Phillip Burkhalter Builders, LLC
- Polk County Chamber of Commerce
- Polk County E-911
- Polk County Fire Dept
- Polk County Government
- Polk County Police
- Polk Family Connection
- Polk School District
- Redmond Regional Medical Center
- Right At Home of Northwest GA
- Rome City Schools
- Rome Fire Department
- Rome Monument Company



- Rome Police Department
- Rome-Floyd Fire Department
- Sara Hightower Regional Library
- Shaw Industries Group, Inc.
- Shorter College
- Sign-Rite
- St. Mary's Catholic School
- Stamey Personal Care Home, LLC
- Suhner Manufacturing, Inc.
- The Doctors Clinic
- Trion City Schools
- Trion Heights Baptist Church
- Tuck's Welding Service, Inc.
- UGA Cooperative Extension
- United Community Bank
- Unity Christian School
- USDA Rural Development
- Victorian Christmas Art Guild
- Walker County Chamber of Commerce
- Walker County Emergency Services
- Walker County Fire Department
- Walker County Government
- Walker County School District

## APPENDIX A: ICT BEST PRACTICES AND TRENDS

The mega-trend in ICTs is toward **more integrated, interactive, and media rich customer-oriented systems**. This trend is apparent in the explosion of blogs, social networking, and other forms of customer/user generated content. The critical characteristic is that the content of information systems is less oriented toward companies and their products, and more focused on customers' ideas, needs, and opinions. The content is no longer just text; increasingly it is streaming video and audio files (i.e., "podcasts" and "webinars"). **The content is also much more dynamic and customized than in the past**. Web-based documents are interactive, pulling data from a variety of sources including the user, to fit a particular activity, interest, need, or objective. For example, you can generate custom business cards at VistaPrint ([www.vistaprint.com](http://www.vistaprint.com)), build their own custom car with BMW ([www.bmwusa.com](http://www.bmwusa.com)), or control and monitor your home with SafeMart ([www.safemart.com](http://www.safemart.com)). These are just small examples of the revolution that is occurring in ICTs.

Another trend in ICTs is mobility. **More and more applications are moving to cell phones**. Customers of SafeMart, for example, can receive notices from their home security system on their cell phones, and actually control their system from a PDA or smart phone. Mobileyes ([www.mobileyes.com](http://www.mobileyes.com)) allows users to view traffic cameras on their cell phones. Cellfire ([www.cellfire.com](http://www.cellfire.com)) sends custom coupons to subscribers' cell phones. Users of sniff ([www.sniffu.com](http://www.sniffu.com)) can locate their friends with their cell phones. Apple, Blackberry, and Google, to mention just a few of the larger providers, have multiple mobile applications. Needless to say, mobile applications are directly impacting many businesses, particularly those that need to be wherever the customers are, healthcare, local government, public safety, even education (see, for example, ToolBook ([www.toolbook.com](http://www.toolbook.com)), which allows you to "create online learning and interactive content" for smart phones). The central idea is that anyone can have any information available to them, anytime, anywhere.

The third general trend is toward online "community." This is apparent in gaming environments like Second Life ([secondlife.com](http://secondlife.com)) and Gaia Online ([www.gaiaonline.com](http://www.gaiaonline.com)), but also with corporate customer online communities such as those operated by Adobe for Acrobat users ([www.acrobatusers.com](http://www.acrobatusers.com)), by Cisco (<http://forums.cisco.com/eforum/servlet/NetProf?page=main>), and for Nikon customers ([www.nikonians.org/](http://www.nikonians.org/)). There are also online communities for almost any interest group one can think of: basketball, pediatrics, trout fishing, etc. The central idea of online communities is **enabling customers and other stakeholders to share ideas and information that adds value to products or services**; to effectively out-source customer support to the customers and create stronger brand identity in the process.

Open source software is a fourth general trend. The central idea with open source is that someone defines some core software (or hardware) function, then others develop additional functions around it, all of which is available for free to anyone who wants to use it. How does anyone make money on this? **Open source revenue comes from value-added products and services that use open source**. For example, IBM sells powerful specialized applications that run on open source operating systems (<http://www-03.ibm.com/opensource/>). Web developers build dynamic websites quickly and profitably with open-source platforms like Dot Net Nuke ([www.dotnetnuke.com/](http://www.dotnetnuke.com/)), Joomla ([www.joomla.org](http://www.joomla.org)), and PHP Nuke ([phpnuke.org](http://phpnuke.org)). While not strictly "open-source hardware" the One Laptop Per Child ([www.laptop.org](http://www.laptop.org)) project is using the open source approach to produce inexpensive, easy to use computers. This project has created a whole new segment of the economy focused on the objective of creating computer that costs less the \$100. (It's not quite there, the XO laptop still costs about \$200).

The last important trend is the provisioning of applications, computing power, and storage as a service over the internet, which is often referred to as "cloud computing" and/or "web 2.0". Related concepts are "software as a service" and "service-oriented architecture." The central idea with each of these is to flexibly use information

infrastructure components, which could literally be physically located most anywhere (including many different locations), to provide most any information service. What does this mean to you? **Cloud computing means lower cost, more flexible information tools.** Consider, for example, Google Docs ([docs.google.com](http://docs.google.com)), which does much of what an office software suite would do, essentially for free. This approach is being used for everything from distributing information work to multiple independent agents (“crowd sourcing”) via Mechanical Turk ([www.mturk.com](http://www.mturk.com)) and efficiently distributing massive files such as movies via BitTorrent ([www.bittorrent.com](http://www.bittorrent.com)), to building customer relationship management systems with [salesforce.com](http://salesforce.com) and social networking on Facebook ([www.facebook.com](http://www.facebook.com)).

The thread that ties all of these trends together is the potential to innovate the value proposition for customers. What does that mean? It means using ICT to do what no one else can, to establish a unique competitive position. Think of it this way: Do you want your agency, business, or community to be just like every other? Similar, maybe, but not the same. **ICTs provide a way to differentiate yourself from others, to better serve existing customers, create new products and services, and reach new customers.** They are the means to redefine traditional business models such for delivering news, providing education, recruiting business, and making investments. These trends are emerging in each of the sectors we examined for this project.

## BUSINESS AND INDUSTRY

The general trend in business and industry is for backend business systems to be fully integrated with the firms’ web presence. More and more, **the web provides the access to enterprise information systems.** This is being enabled by increased openness and standardization by many enterprise software systems. The “traditional” business applications are being supplemented. Customer-centric data models are used to create customer experiences for each customer and to develop fully interactive relationships with customers via surveys/polls, blogs, podcasts, streaming video, social networking, wikis. **The technology trends discussed above are enabling value chain integration,** which goes beyond the supply chain, backwards to product design, laterally into complementary and value-added products and services, and forwards to the consumer for maintenance, support, and even product disposal and recycling.

Cloud computing and mobile computing are making it more practical to **build intelligence into products and to access data from wherever the product might be** (consider the vehicle maintenance and tracking service provide by Air Automotive Tracking ([www.aatracking.com](http://www.aatracking.com))). They are also making workers more mobile so they can support clients from anywhere at any time. Intelligent business systems and automated data analysis are enabling product/service innovations driven by relationship with customers: **ICTs make it possible to respond to, as well as sense, what the customer wants** better than competitors... or even the customer.

## WEB LINKS FOR EXAMPLES, RESOURCES, AND ADDITIONAL INFORMATION

- Business Technology Quarterly, [www.btquarterly.com](http://www.btquarterly.com)
- Inc Magazine, [www.inc.com/resources/technology](http://www.inc.com/resources/technology))
- CNet, [news.cnet.com/Eight-business-technology-trends-to-watch/2030-1069\\_3-6223397.html](http://news.cnet.com/Eight-business-technology-trends-to-watch/2030-1069_3-6223397.html)
- Article on Web Apps/Cloud Computing, [www.infoworld.com/article/08/04/07/15FE-cloud-computing-reality\\_1.html](http://www.infoworld.com/article/08/04/07/15FE-cloud-computing-reality_1.html)
- Google Apps, [www.google.com/apps](http://www.google.com/apps)
- Microsoft, [www.officelive.com](http://www.officelive.com)
- Georgia Tech, [www.innovate.gatech.edu/industry](http://www.innovate.gatech.edu/industry), [www.innovate.gatech.edu/es](http://www.innovate.gatech.edu/es)

## EDUCATION

ICTs are having a huge impact in education. In keeping with the trends discussed above, the general trend is away from the computer as a replacement for the teacher, to **technology as an enabler of a “just-in-time” learning process**. We discuss above how the technology is enabling more flexible and interactive applications, and this is equally true for classrooms. Technologies like interactive white boards, streaming video and interactive multimedia content, and virtual classes/laboratories are making it practical to adapt lessons to different learning styles. Dynamic student support is provided by online study aids and reference resource, podcasts of lesson materials, and mobile learning environment. **A major impediment remains the availability of computers**. There are currently approximately four students per computer. Our benchmarking found education had 2.6 users per computer, but this included all personal computers and all users, not just students.

**A fundamental transformation in educational ICTs parallels the development of business intelligence**: electronic student records and real-time student performance analysis. These applications have **reduced with administrative overhead and workload on teachers** by automating the grading process. At the same time, they have reduced the use of paper, making processes more efficient and less wasteful. More importantly, they **allow for adaptive and highly individualized curriculum**, and for teachers to attend to students when and where the attention will be most impactful. When such applications are broadly implemented and standardized they greatly facilitate improvements in education such as cross-enrollment in higher education and collaboration with educational support organizations. Essentially, they make it so **learning can occur with anyone anywhere at any time**.

#### WEB LINKS FOR EXAMPLES, RESOURCES, AND ADDITIONAL INFORMATION

- North Central Regional Educational Laboratory, Technology in Education, [www.ncrel.org/sdrs/areas/te0cont.htm](http://www.ncrel.org/sdrs/areas/te0cont.htm)
- International Society for Technology in Education, [www.iste.org/](http://www.iste.org/)
- Regional Technology in Education Consortia Resource Center, [www.rtec.org/](http://www.rtec.org/)
- SouthEast Initiatives Regional Technology in Education Consortium, [www.seirtec.org/](http://www.seirtec.org/)
- eSchool News Online [www.eschoolnews.com/](http://www.eschoolnews.com/)
- Cobb County 21st Century Classroom Initiative, [www.cobbk12.org/21stCentury/](http://www.cobbk12.org/21stCentury/)

#### HEALTHCARE

As in business & industry and education, **healthcare is moving to digital information systems for clients**. Electronic medical records (EMRs) have been mandated by the federal government, including demand standards for security and privacy, and standards for sharing patient information. **The goal is consumer empowerment as much as it is operational efficiency**: Ready access to your health information (and health information for those you take care of) will help you make better healthcare decisions, decrease healthcare costs, and improve quality of life. Health Information Exchange Networks (HIE) and Regional Health Information Organizations (RHIO) enable timely yet secure sharing of EMRs.

EMRs are also critical to another fundamental change in healthcare, the move toward more collaborative medicine. **General practitioners, specialists, and other healthcare professionals are increasingly able to work together** effectively and efficiently without regard for location via the technology. This applies to pathology and lab work, radiology and other digital imaging, and even surgery. With mobile technologies, they can work with emergency medical technicians to perform remote triage. Personal and residential telehealth technologies are increasing the ability for patients to manage their conditions and collaborate with healthcare providers from wherever they might be, at home, at work, even on the road. Automatic data collection with embedded mobile sensors, bar coding, and radio frequency identification (RFID) are used to respond to problems before they get serious and avoid medical errors. Similar technologies, particularly geographic positioning systems, improve the

dispatching, routing, and tracking of mobile assets such as ambulances. **All of this adds up to smarter and less costly care.**

**More and better health information is showing up online**, increasingly provided by legitimate sources like hospitals and physicians offices. By combining online information with EMR, telehealth, and other information **systems makes it possible for patients to have highly customized information just a click away**, including functions such as reviewing insurance claims, refilling prescriptions, and scheduling appointments. Healthcare professionals can use business intelligence type tools to analyze health records and patient queries in order to **identify disease outbreaks, alert healthcare providers, and mobilize public health resources**. Such applications could effectively mitigate a potential pandemic, and greatly improve local and regional crisis management. **They reduce the cost of routine healthcare and help avoid costs—human as well as monetary—of health emergencies.**

#### WEB LINKS FOR EXAMPLES, RESOURCES, AND ADDITIONAL INFORMATION

- Health Care's Most Wired, [www.hhnmostwired.com](http://www.hhnmostwired.com)
- U.S. Department of Health and Human Services, [www.hhs.gov](http://www.hhs.gov)
  - Health Information Technology home page [www.hhs.gov/healthit](http://www.hhs.gov/healthit)
  - Agency for Healthcare Research and Quality (AHRQ), [healthit.ahrq.gov](http://healthit.ahrq.gov)
  - Federal Health IT Strategic Plan, [www.hhs.gov/healthit/resources/HITStrategicPlan.pdf](http://www.hhs.gov/healthit/resources/HITStrategicPlan.pdf)
- The Brookings Institute
  - [www.brookings.edu/topics/health-care.aspx](http://www.brookings.edu/topics/health-care.aspx)
  - [www.brookings.edu/events/2008/1124\\_healthIT.aspx](http://www.brookings.edu/events/2008/1124_healthIT.aspx)
- Georgia Department of Public Health, [health.state.ga.us/healthdata/index.asp](http://health.state.ga.us/healthdata/index.asp)
- A Healthcare Information Blog, [thielst.typepad.com/my\\_weblog/](http://thielst.typepad.com/my_weblog/)

#### LOCAL GOVERNMENT

**Local government is refocusing of ICTs on customers (citizens, constituents) by integrating departmental information into a common interface to local government functions.** This transformation occurred in business over a decade ago, but local governments have very different functions and an evolved set of tools for fulfilling those functions. The private sector driver for enterprise integration was costs: decreasing the costs associated with locating and coordinating resources within the firm, as well as reducing the duplication of IT costs. Such opportunities for local government are exemplified by geographic information systems (GIS). Local governments may have multiple GIS for education, planning and zoning, public safety, public health, and tax assessment, which creates the opportunity to merge the applications and data sets, and even to subscribe to GIS as a service. **Such integration greatly reduces the cost of ICTs, but can also enable more efficient operations and more effective and rapid response to citizens and situations.**

ICTs are enabling local governments to move beyond cost savings and efficiency gains to participative relationships with citizens referred to as “e-democracy.” **E-democracy leverages ICTs to provide citizens with easier access to government functions.** Simple examples include online streaming (real time) video of public meetings, or “podcasting” the meetings. E-democracy also incorporates “classic” web functions like blogs, discussion forums, and online surveys and polls. An example of how these might be combined, including “old-fashioned” telephone, is the Albemarle County Public Schools. Agendas and packets for school board meetings are electronic, and the school board meetings are recorded and made available as podcasts (at [schoolcenter.k12albemarle.org](http://schoolcenter.k12albemarle.org)). Some 50,000 citizens participated in “Telephone Town Hall” meetings held “to build public understanding of the budget

development process and increase public participation.”<sup>2</sup> Participants were able to ask questions, respond to polls, and review questions and answers in written form afterwards. It cost about seven cents per caller and eliminated the need for large facilities and lots of driving to accommodate such participation.

**Local governments are also implementing dynamic data services using ICTs.** The prime example of this is the widespread availability of local property tax parcel data via online GIS systems. Other examples include street and school closings, and utilities outages. This function is being expanded to topics such as budget allocations, community and social services, crime incidences, economic development incentives, and communications with elected officials. Internally, dynamic data services are being used for real-time, integrated resource allocation and management. Examples include vehicle maintenance and tracking, training and knowledge delivery (particularly for public safety), assignments for and management of mobile workforce, permitting and inspections, licensing, fee assessments and payment, offering and managing recreation facilities and programs, and resource (particularly water) conservation and management.

#### WEB LINKS FOR EXAMPLES, RESOURCES, AND ADDITIONAL INFORMATION

- Center for Democracy and Technology e-Government Handbook, [www.cdt.org/egov/handbook/](http://www.cdt.org/egov/handbook/)
- Center for Digital Democracy, [www.democraticmedia.org](http://www.democraticmedia.org)
- E-Democracy.Org
- GMIS International, professional organization for public sector IT leaders, [www.gmis.org](http://www.gmis.org), Georgia chapter, [www.gagmis.org](http://www.gagmis.org)
- Government Computer News, [gcn.com](http://gcn.com)
- Government Technology magazine, [www.govtech.com](http://www.govtech.com)
- Public Sphere Information Group Municipal eGovernment Best Practices, [www.psigroup.biz/megap/best\\_practices.php](http://www.psigroup.biz/megap/best_practices.php)

#### PUBLIC SAFETY

**Public safety exemplifies the general trend toward mobile applications.** This sector is driving—literally and figuratively—diffusion of in-vehicle technologies such as mobile data access, advanced vehicle location systems, video surveillance, and displays/printers. **Communications is a major issue for public safety.** The various communications systems used in public safety need to be interoperable for coordinated incident response. They also need access to a high-speed/high-reliability wireless data network to link facilities, vehicles, and personnel. And they are doing more to automate notification of incidents for officials and first responders, and provide public systems for public safety alerts. Mobile applications in public safety are increasingly including video for recording incidents and for surveillance. Not only can public safety personnel monitor transportation infrastructure for problems, in some communities they can view activities in high-crime areas, in schools, or even in private buildings such as banks in order to respond to and prosecute criminals.

**There is generally a move toward integrated public safety data systems,** particularly for computer aided dispatch and coordination with multiple agencies via E-911. There is also a more public side to such systems with local public safety information web portals for sharing critical information with citizens, during crises or as a part of community-based policing, “crime watchers,” neighborhood watches, or similar collaborative approaches to public

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<sup>2</sup> While this example involves a school board, it is included in this section because it is a governance function rather than an education function. For more information about Albemarle County Public Schools Telephone Town Hall meetings, visit <http://schoolcenter.k12albemarle.org/education/dept/deptinfo.php?sectiondetailid=77398>, or listen to a National Public Radio story about it at <http://www.npr.org/templates/story/story.php?storyId=100831091>.

safety. Such portals include high-profile information such as information from the sex offenders registry or “most wanted” list. They also include basic information about how to make family emergency plans, how to deal injuries, poisoning, stroke, or other first aid situations, and how to secure your home or business. More sophisticated applications include neighborhood watch coordination, mapping crime incidents, and even sensor data.

#### WEB LINKS FOR EXAMPLES, RESOURCES, AND ADDITIONAL INFORMATION

- Crime mapping systems:
  - Chicago Police CLEARMAP, Citizen Law Enforcement Analysis and Reporting, [gis.chicagopolice.org](http://gis.chicagopolice.org)
  - Los Angeles Police Department Crime Maps, [www.lapdcrimemaps.org](http://www.lapdcrimemaps.org)
  - Independent systems: EveryBlock, [everyblock.com](http://everyblock.com), and SpotCrime, [www.spotcrime.com](http://www.spotcrime.com)
- Department of Homeland Security SAFECOM, [www.safecomprogram.gov/SAFECOM](http://www.safecomprogram.gov/SAFECOM)
- EMS Responder articles for technology, [www.emsresponder.com/features/fullsection.jsp?siteSection=7](http://www.emsresponder.com/features/fullsection.jsp?siteSection=7)
- Government Technology magazine, A Practical Guide To Advancing Public Safety Through The Use Of Technology Solutions, [www.govtech.com/gt/case\\_study/283204](http://www.govtech.com/gt/case_study/283204)
- National Institute of Standards and Technology (NIST) Technologies for Public Safety and Security, [www.nist.gov/public\\_affairs/factsheet/homeland.htm](http://www.nist.gov/public_affairs/factsheet/homeland.htm)
- National Sheriff’s Association Neighborhood Watch Program, USA On Watch, [www.usaonwatch.org](http://www.usaonwatch.org)

## APPENDIX B: RESOURCES

There are a wide range of financial and other resources available to the initiatives discussed in this report. Most of the funding opportunities discussed below require significant (20% - 50%) matching funds. Other resources for carrying out the action plan include existing physical assets, specifically vertical assets (radio towers), and regional technology companies. A map and list of vertical assets and a list of technology companies are included as appendices to this report.

### FUNDING SOURCES

#### THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)

The Obama administration's economic stimulus package, formally known as the American Recovery and Reinvestment Act of 2009, provides a substantial amount of financial resources for broadband, health information technology, public safety, schools, "smart [electrical] grid," traditional infrastructure, and a variety of other purposes. The bulk of the funds will be disbursed through federal agencies, supplementing previously established programs, and the remainder through local and state governments. As of the writing of this report the specifics of such disbursements have yet to be announced.

For more information, visit <http://thomas.loc.gov/cgi-bin/query/z?c111:H.R.1.enr>:

#### APPALACHIAN REGIONAL COMMISSION (ARC)

"The Appalachian Regional Commission is a federal-state partnership that works with the people of Appalachia to create opportunities for self-sustaining economic development and improved quality of life." All four counties included in this project are part of ARC's area. ARC primarily provides valuable data and information resources, but also has some funding available, primarily for traditional (roads, sewer, water, etc) infrastructure. Language in the ARRA suggests additional federal funds will flow through the ARC. Projects must have demonstrable results in one or more of ARC's strategic goals areas:

1. Increase job opportunities and per capita income in Appalachia to reach parity with the nation
2. Strengthen the capacity of the people of Appalachia to compete in the global economy
3. Develop and improve Appalachia's infrastructure to make the Region economically competitive
4. Build the Appalachian Development Highway System to reduce Appalachia's isolation

For more information, visit [www.arc.gov](http://www.arc.gov), or contact Georgia Program Manager James Thompson at 404-679-1584 or [james.thompson@dca.ga.gov](mailto:james.thompson@dca.ga.gov).

#### ECONOMIC DEVELOPMENT ADMINISTRATION (EDA)

EDA, a unit of the US Department of Commerce, provides diverse assistance, including funding, "to generate jobs, help retain existing jobs, and stimulate industrial and commercial growth in economically distressed areas of the United States. EDA assistance is available to rural and urban areas of the Nation experiencing high unemployment, low income, or other severe economic distress." While none of EDA's programs focus specifically on information infrastructure, a number might provide assistance or support for tactics included in the action plan.

For more information, visit [www.eda.gov/AboutEDA/Programs.xml](http://www.eda.gov/AboutEDA/Programs.xml)

#### NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION (NTIA)



NTIA, a unit of the US Department of Commerce, has offered significant funding in the areas of community and public safety information infrastructure. A notable program is the Technology Opportunities Program (TOP) that was suspended under the Bush administration but has been re-funded by ARRA. Details about the revitalized TOP program had not been announced at the writing of this report.

For more information, visit [www.ntia.doc.gov](http://www.ntia.doc.gov)

### ONEGEORGIA AUTHORITY (OGA)

OGA provides a variety of financial programs to “promote the health, welfare, safety, and economic security of the citizens of the state.” Specifically the Broadband Rural Initiative to Develop Georgia’s Economy (BRIDGE) “provides grants and loans for publicly owned infrastructure for new or enhanced high speed broadband services.” The northwest Georgia TechSmart project was funded largely by the BRIDGE program. This funding might be appropriate for the Smart Site program, and even more appropriate for the Dead Spot initiative where focused on broadband. Other OGA programs, specifically the Equity Fund and Strategic Industries Loan Fund, might be appropriate depending on the type of project, type of firm involved, and lack of private sector resources. OGA funds may be used as a match for federal funding programs.

For more information, visit [www.onegeorgia.org](http://www.onegeorgia.org)

### UNIVERSAL SERVICE ADMINISTRATIVE COMPANY (USAC)

USAC is a quasi public non-profit corporation that administers the universal service fees paid by telephone subscribers to their telephone companies. The funds are available to areas that are expensive to serve with telecommunications services, to rural healthcare providers, to serve low-income citizens, and to schools and libraries (often referred to as “e-rate”). The high-cost and low-income programs are effectively limited to voice-grade wireline telephone services. The other programs pay a portion of telecommunications costs to rural healthcare providers and to schools and libraries.

For more information, visit [www.universalservice.org](http://www.universalservice.org)

### USDA TELECOMMUNICATIONS PROGRAM

Administered by USDA Rural Development, under the Rural Utility Services, this program funds broadband, distance learning, telemedicine, and other projects. “USDA Rural Development's mission is to increase economic opportunity and improve the quality of life for rural residents.” The broadband program, Community Connect, focuses on locales that have very limited availability of broadband, where it will make a marked improvement in the local economy. The distance learning and telemedicine grants provide funds to start-up projects that deliver curriculum or medical services electronically. Eligible expenses are somewhat limited: The program does not pay for transmission facilities or services, nor does it pay for any operating expenses. The ARRA includes additional funding for USDA Rural Development, the Rural Utility Service, the Telecommunications Program, and other programs.

For more information, visit [www.usda.gov/rus/telecom/index.htm](http://www.usda.gov/rus/telecom/index.htm), or contact Field Representative Andrew Hayes at [andrew.hayes@wdc.usda.gov](mailto:andrew.hayes@wdc.usda.gov) or 770-914-8643

### STANDARDS RESOURCES

This plan recommends northwest Georgia stakeholders collaborate on standardizing their information infrastructure. The following are online sources of information about information and communications technology standards. Text in quotes (“”) is drawn directly from the cited website.

**DATA INTERCHANGE STANDARDS ASSOCIATION, [WWW.DISA.ORG](http://WWW.DISA.ORG)**

The Data Interchange Standards Association (DISA) advances the foundation of electronic trade and commerce by supporting and promoting standards used for business-to-business data exchange. Providing administrative and technical support to the Accredited Standards Committee (ASC) X12, DISA helps individuals and organizations improve business processes, reduce costs, increase productivity and take advantage of new opportunities.

**ESERVER TC LIBRARY, WEB DESIGN STANDARDS, [TC.ESERVER.ORG/DIR/DESIGN/WEB-DESIGN/STANDARDS](http://TC.ESERVER.ORG/DIR/DESIGN/WEB-DESIGN/STANDARDS)**

A compendium of web design standards with descriptions and ratings.

**GEOGRAPHIC INFORMATION SYSTEMS: STANDARDS AND GUIDELINES IN THE STATE OF GEORGIA,**

[WWW.GIS.STATE.GA.US/EDOCS/GISCC/GISSTAND.HTML](http://WWW.GIS.STATE.GA.US/EDOCS/GISCC/GISSTAND.HTML)

**GEORGIA TECHNOLOGY AUTHORITY, ENTERPRISE POLICY, STANDARDS & ARCHITECTURE,**

[GTA.GEORGIA.GOV/00/CHANNEL\\_TITLE/0,2094,1070969\\_6947051,00.HTML](http://GTA.GEORGIA.GOV/00/CHANNEL_TITLE/0,2094,1070969_6947051,00.HTML)

“The Official Code of Georgia Annotated, O.C.G.A. §50-25-04(a)(10), vests GTA with authority to “set technology policy for all agencies except those under the authority, direction or control of the General Assembly or statewide elected officials other than the Governor.” The GTA Board of Directors has implemented technology policies pursuant to state statute through the policy on Information Technology Policies, Standards and Guidelines, PM-04-001.03.

“The Official Code of Georgia Annotated, O.C.G.A. §50-25-4(a)(21), related to security policies, standards and guidelines is broader than the general statutory authority granted GTA with respect to technology policies. It authorizes GTA to establish statewide security policies and standards that are binding on all agencies. The GTA Board of Directors has implemented security policies pursuant to state statute through the Enterprise Information Security Charter, PS-08-005.01.”

**INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY RESOURCES***ITIL Open Guide, [www.itlibrary.org](http://www.itlibrary.org)*

“The Information Technology Infrastructure Library (ITIL) defines the organisational structure and skill requirements of an information technology organisation and a set of standard operational management procedures and practices to allow the organisation to manage an IT operation and associated infrastructure. The operational procedures and practices are supplier independent and apply to all aspects within the IT Infrastructure.”

*Official ITIL website, [www.itil-officialsite.com](http://www.itil-officialsite.com)*

“ITIL® is the most widely accepted approach to IT service management in the world. ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally.”

*Wikipedia entry, [en.wikipedia.org/wiki/ITIL](http://en.wikipedia.org/wiki/ITIL)*

“The Information Technology Infrastructure Library (ITIL) is a set of concepts and policies for managing information technology (IT) infrastructure, development and operations.”

**INTERNATIONAL COMMITTEE FOR INFORMATION TECHNOLOGY STANDARDS, [WWW.INCITS.ORG](http://WWW.INCITS.ORG)**

“INCITS is the primary U.S. focus of standardization in the field of Information and Communications Technologies (ICT), encompassing storage, processing, transfer, display, management, organization, and retrieval of information.

As such, INCITS also serves as ANSI's Technical Advisory Group for ISO/IEC Joint Technical Committee 1. JTC 1 is responsible for International standardization in the field of Information Technology”

INTERNATIONAL STANDARDS ORGANIZATION, FREELY AVAILABLE STANDARDS,  
[STANDARDS.ISO.ORG/ITTF/PUBLICLYAVAILABLESTANDARDS/INDEX.HTML](http://STANDARDS.ISO.ORG/ITTF/PUBLICLYAVAILABLESTANDARDS/INDEX.HTML)

INTERNATIONAL TELECOMMUNICATIONS UNION, [WWW.ITU.INT](http://WWW.ITU.INT)

“ITU is the leading United Nations agency for information and communication technology issues, and the global focal point for governments and the private sector in developing networks and services. For nearly 145 years, ITU has coordinated the shared global use of the radio spectrum, promoted international cooperation in assigning satellite orbits, worked to improve telecommunication infrastructure in the developing world, established the worldwide standards that foster seamless interconnection of a vast range of communications systems and addressed the global challenges of our times, such as mitigating climate change and strengthening cybersecurity.”

INTERNET SOCIETY, STANDARDS INFORMATION, [WWW.ISOC.ORG/STANDARDS/](http://WWW.ISOC.ORG/STANDARDS/)

“The Internet is built on technical standards, which allow devices, services, and applications to be interoperable across a wide and dispersed network of networks. Internet standards are developed by group of organisations which operate under the auspices of the Internet Society (ISOC).

“ISOC is the organisational home of the Internet Engineering Task Force (IETF), the Internet Architecture Board (IAB), the Internet Engineering Steering Group (IESG), and the Internet Research Task Force (IRTF) — the standards setting and research arms of the Internet community. These are open organisations, relying on transparent, bottom-up processes to build consensus. Thousands of people from around the world participate in the process and the standards they develop are free and accessible to everyone.”

OPEN GEOSPATIAL CONSORTIUM, [WWW.OPENGEOSPATIAL.ORG](http://WWW.OPENGEOSPATIAL.ORG)

“The Open Geospatial Consortium, Inc.® (OGC) is a non-profit, international, voluntary consensus standards organization that is leading the development of standards for geospatial and location based services.”

STANDARDS.GOV

“Standards.Gov offers background materials and useful links for locating information about the use of standards in government.”

US HEALTH & HUMAN SERVICES, HEALTH INFORMATION STANDARDS,  
[WWW.HHS.GOV/VALUEDRIVEN/FOURCORNERSTONES/HEALTHIT/INDEX.HTML](http://WWW.HHS.GOV/VALUEDRIVEN/FOURCORNERSTONES/HEALTHIT/INDEX.HTML)

“The American Health Information Community, supported by the Office of the National Coordinator for Health IT at HHS, includes representatives from health care professions, technology vendors, government agencies, employers and patients. The Community was convened to advise in the development of health IT standards.

“Health IT standards will ensure that health care providers have instant, secure access to accurate patient records through EHRs. EHRs will replace the medical clipboard. In addition, standards will enable patients managing chronic diseases to coordinate and monitor their care among different providers.”

US HEALTH & HUMAN SERVICES, HEALTH IT HOMEPAGE, [WWW.HHS.GOV/HEALTHIT/](http://WWW.HHS.GOV/HEALTHIT/)

“Health information technology (Health IT) allows comprehensive management of medical information and its secure exchange between health care consumers and providers”

WORLD WIDE WEB CONSORTIUM, [WWW.W3.ORG](http://WWW.W3.ORG)

“The World Wide Web Consortium (W3C) develops interoperable technologies (specifications, guidelines, software, and tools) to lead the Web to its full potential. W3C is a forum for information, commerce, communication, and collective understanding.”

## APPENDIX C: REGIONAL ICT PROVIDERS

### TELECOMMUNICATIONS

#### CELLULAR TELEPHONE SERVICE COVERAGE MAPS

##### *Alltel*

[http://content.alltel.com/business/enhanced/mobilelink\\_coverage.jsp?state=ga](http://content.alltel.com/business/enhanced/mobilelink_coverage.jsp?state=ga)

##### *AT&T*

<http://www.wireless.att.com/coverageviewer/>

##### *SouthernLINC*

<http://www.southernlinc.com/ourcoverage.asp>

##### *Sprint*

<http://coverage.sprintpcs.com/IMPACT.jsp?PCode=vanity:coverage>

##### *Suncom*

<http://suncom-public.spatialpoint.com/>

##### *T-Mobile*

<http://www.t-mobile.com/coverage/>

##### *Verizon*

<http://www.verizonwireless.com/b2c/CoverageLocatorController?requesttype=ZOOM%20IN>

### INCUMBENT CABLE AND TELEPHONE PROVIDERS

#### *AT&T Georgia*

[www.att.com](http://www.att.com)

Service area: Floyd, Polk

Don Barbour  
Regional Manager - External Affairs  
770-422-2425  
[don.barbour@att.com](mailto:don.barbour@att.com)

Peter F. Martin  
Vice President - Regulatory & External Affairs  
404-829-9903  
[pete.martin@att.com](mailto:pete.martin@att.com)

2180 Lake Boulevard, Suite A1273  
Atlanta, GA 30319

#### *Charter Communications*

[www.charter.com](http://www.charter.com)

Franchise Area: Bremen, Cedartown, Villa Rica

770-304-5836, 770-748-4000  
303 Main Street  
Cedartown, GA 30125

#### *Chickamauga Telephone Corporation*

[www.chickamauga.com](http://www.chickamauga.com)

Service area: Chickamauga, other portions of Walker County

Mark McDonald, Manager  
706-375-3195  
[markmc@intop.net](mailto:markmc@intop.net)  
300 Thomas Avenue, P. O. Box 729  
Chickamauga, GA 30707

#### *Comcast Cable*

[www.comcast.com](http://www.comcast.com)

Service area: Chickamauga, Fort Oglethorpe, Lafayette, Lookout Mountain, Rossville

423-855-3900  
707 East First Street, P.O. Box 182249  
Chattanooga, TN 37422

Service area: Cities: Calhoun, Carrollton, Dallas, Hiram, Mt. Zion, Plainville, Resaca, Rome, Tallapoosa, Waco, Whitesburg, Villa Rica; Counties: Carroll, Floyd, Gordon, Haralson, Paulding

706-291-7288  
702/704 Broad Street, P.O. Box 241  
Rome, GA 30162

#### *Windstream Communications*

[www.windstream.com](http://www.windstream.com)

Service area: Chattooga, Walker

706-657-4367

Rick Moreland  
Vice President - State Government Affairs  
478-454-3312  
Rick.Moreland@windstream.com  
P. O. Box 868  
Milledgeville, GA 31059

Terry Moore  
Director of Business Solutions, North  
Georgia  
706-279-7621  
terry.moore@windstream.com

Dennis Carney  
dennis.carney@windstream.com

## COMPUTER AND SOFTWARE

*4 All Things Web*  
<http://4allthingsweb.com>

Mike Crane  
423-877-5533  
[mike@4allthingsweb.com](mailto:mike@4allthingsweb.com)  
905 Lafayette Rd  
Rossville, GA 30741

### *Ace Computers*

Mark Long  
(706) 234-1111  
[trashe-mail@comcast.net](mailto:trashe-mail@comcast.net)  
1021 Desoto Ave Nw  
Rome, GA 30165

## OTHER PROVIDERS

*Parker Fiber Systems*  
[www.parkersystems.net](http://www.parkersystems.net)

David Parker, President  
1-800-8-PARKER  
david@parkersystems.net

*Synchronet*  
[www.synchronet.org](http://www.synchronet.org)

Kyle Williamson, President  
770-537-1410  
kyle\_williamson@synchronet.org

*Thoroughbred Technology and  
Telecommunications*  
[www.t3inc.com](http://www.t3inc.com)

George Eichelberger  
Director - Technical and Marketing Services  
404-962-5541  
George.Eichelberger@t3inc.com  
1200 Peachtree Street, NE, Atlanta, Georgia  
30309

### *Trenton Telephone Company*

William R. Tatum  
President/CEO

*Affordable Computers*  
<http://www.affordablecomp.com/>

Steve Flegal  
(706) 858-5888  
ac58@comcast.net  
2643 Battlefield Pkwy  
Fort Oglethorpe, GA 30742

### *Alto Computers*

Becky Adams  
(706) 295-1020  
610 Shorter Ave NW Ste 5  
Rome, GA 30161

### *Barnett, Bo & Paige*

(706) 290-1461  
127 Beech Creek Dr Nw  
Rome, GA 30165

### *Bear Technologies Custom Computers*

(706) 375-2943  
136 Dana Ln  
Chickamauga, GA 30707

*Bits & Bytes Computers*

(706) 861-0001  
916 Lafayette Rd  
Rossville, GA 30741

*Circuit City*

(706) 295-9654  
2700 Martha Berry Hwy Ne  
Rome, GA 30165

*Computer Port Unlimited*

<http://www.cpuzone.org/>

(770) 749-1226  
Sales@cpuzone.org  
114 West Ave  
Cedartown, GA 30125

*Computer Port Unlimited Fifth Street*

(770) 748-8840  
362 5th St  
Cedartown, GA 30125

*ComputerEze*

(706) 866-2625  
965 E Circle Dr  
Rossville, GA 30741

*Georgia Computer Depot*

Ray McCrary  
(770) 748-0260  
gacomputerdepot@gmail.com  
1389 S Main St  
Cedartown, GA 30125

*Gigabytes Computers*

Adam Adcock  
(706) 602-7272  
adamadcock@gmail.com  
901 S Wall St  
Calhoun, GA 30701

*Global Computers*

(706) 638-6788  
globalcomputers@aol.com  
102 N Main St

La Fayette, GA 30728

*In-Touch Computer Services*

<http://www.itgeorgia.com/>

Tim Leonard  
(706) 232-9557  
tim.leonard@itgeorgia.com  
901 North Broad St., Suite 100  
Rome, GA 30161

*Invictus Technologies*

(706) 291-6800  
157 Haywood Valley Rd  
Armuchee, GA 30105

*Kemco*

<http://www.kemconet.com/>

(706) 375-6228  
info@kemconet.com  
8019 N Highway 27  
Rock Spring, GA 30739

*L A N Star Technologies*

<http://www.lanstartech.com/>

(706) 368-9774  
info@lanstartech.com  
308 Glen Milner Blvd  
Rome, GA 30161

*LanSource Inc*

<http://www.lansourcenet.com/>

(706) 234-2653  
Sales@lansourcenet.com  
4 Pike St Nw  
Rome, GA 30165

*Logical Systems*

<http://www.logsysinc.com/>

(706) 234-9896  
sales@logsysinc.com  
605 E 1st St  
Rome, GA 30161

*M W D Consulting and Development*

(706) 235-1428  
2949 Old Dalton Rd NE  
Rome, GA 30165-8942

96 E Callahan St Ne  
Rome, GA 30161

*Office Depot*

<http://www.officedepot.com/>

*Management Insights*

Colin Kelly  
(706) 291-0513  
cpk@minsight.com  
304 Pheasant Run Se  
Rome, GA 30161

(706) 233-9666  
2112 Shorter Ave Nw  
Rome, GA 30165

*Reynolds' Computer Repair*

(706) 512-7480  
1644 Morton Bend Rd Sw  
Rome, GA 30161

*Mcelwee Computer Systems*

<http://mcelweecomputersystems.com/>

(770) 749-2006  
mathew@mcelweecomputersystems.com  
206 N Philpot St  
Cedartown, GA 30125

*Staples*

<http://www.staples.com/>

(706) 291-8106  
212 Shorter Ave Nw  
Rome, GA 30165

*Medeasy*

<http://www.medeasyinc.com/>

Andy Morris  
(706) 378-9115  
andymorris@medeasyinc.com  
320 W 9th St Ne  
Rome, GA 30165

*Telenet Systems*

Linda Moody  
(706) 291-4488  
linda\_moody@bellsouth.net  
16 Industrial Blvd Se  
Rome, GA 30161

*Micro Plus*

Keon Lee  
(706) 235-7843  
mpiklee@comcast.net  
2002 Redmond Cir Nw  
Rome, GA 30165

*TetraSoft Computers*

Michael Endfinger  
(706) 292-9717  
endfingerms@tetrasoftpc.com  
4372 Martha Berry Hwy Ne  
Rome, GA 30165

*Midrange Solutions*

(706) 291-2529  
304 N 4th Ave Sw  
Rome, GA 30165

*The Computer Shop*

<http://www.computershopga.net/>

Randy Money  
(706) 859-0031  
thecomputershop@alltel.net  
25 E Washington St  
Summerville, GA 30747

*N S S Corporation*

(706) 368-9834  
4967 Martha Berry Hwy Nw  
Rome, GA 30165

*Tri-Mar Computers*

<http://www.tri-mar.com/>

*Networking Solutions of Georgia*

(706) 295-2773



Jim Davis  
(706) 234-6262  
jdavis@tri-mar.com  
2445 Shorter Ave Sw  
Rome, GA 30165

*Universal Tax Systems*  
<http://www.taxwise.com/index.html>

(706) 232-7757  
6 Mathis Dr Nw  
Rome, GA 30165

*US Biogistics*  
<http://www.usbiogistics.com/>

(706) 235-1671  
119 Cherry St Sw  
Rome, GA 30165

*White Oak Design*  
<http://www.whiteoakdesign.com/>

(706) 375-6531  
webmaster@whiteoakdesign.com  
1003 Taylor Broome Rd  
Chickamauga, GA 30707